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Dear Reader,

In order to obtain the views of various readers in the developing as well as the developed countries with regard to the future prospects of industrialization, UNIDO would like to ask you to kindly answer the following questions and return the questionnaire to us as soon as possible.

A. How is your country performing economically this year (1987) as compared to last year?

	Slower	*Same*	*Faster*
GDP growth	____	____	____
Industrial output	____	____	____
Industrial investment	____	____	____
Exports of manufactures	____	____	____

What is your forecast for the next year (1988)?
(Please give annual growth rates if possible.)

	Slower	*Same*	*Faster*
GDP growth	____	____	____
Industrial output	____	____	____
Industrial investment	____	____	____
Exports of manufactures	____	____	____

B. How would you rate the importance of the contribution of the following in achieving a faster pace of industrialization in the specific context of your own country?

(1) *Domestic factors* (Please check *three* items.)

- Improved transport and communication facilities ____
- Priority to R and D in industry ____
- Improved supplies of electricity and water ____
- Secure and regular supplies of raw materials ____
- Improved storage and distribution systems ____
- Improved mobilization of domestic savings ____
- Greater stimulus for local entrepreneurial initiative ____
- Improved support for rural and small-scale industries ____
- More emphasis on the training of industrial manpower ____
- Improved management of existing industrial enterprises ____
- Less government regulation and control of the private sector ____
- Greater government participation in the industrial sector ____
- Other (please specify) ____

(2) *External factors* (Please check *three* items.)

- More stable exchange rates ____
- Lower interest rates ____
- Relief on external debt repayments ____
- Expansion of world trade ____
- Improvement in the terms of trade ____
- Increase in external financing ____
- Greater direct foreign investment ____
- Reducing protectionism in developed countries ____
- Genuine technology transfer ____
- Co-ordinated macro policies among advanced industrial countries ____
- Expanded South-South co-operation in the production of manufactured goods ____
- Other (please specify) ____

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INDUSTRY AND DEVELOPMENT

GLOBAL REPORT 1987

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna, 1987

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The Industry and Development *Global Report* is prepared by the Global Studies Branch of UNIDO as an annual review of the world industrial economy. The Statistics and Survey Unit provided relevant statistics. In this year's *Report*, Young Rin Cho was responsible for drafting Chapter I, Youngil Lim for Chapter II, Se-Hark Park for Chapter III, Richard Line, with special assistance from Masayoshi Matsushita, for Chapter IV and Mikoto Usui for Chapter V. The team was assisted by John Cody, Anna Gelei, Paul Wiedemann, Bruno Dissmann and Gerhard Margreiter. Guidance as to general orientation as well as comments on the substantive content have been received from Mr. Domingo L. Siazon, Jr., Mr. H. P. F. Wiesebach and Mr. M. Usui.

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Preface

Industry and Development: Global Report 1987 is the third in the series of annual UNIDO overviews of the global industrialization scene. It is a publication that has come to be regarded as one of the main channels of communication between UNIDO and all other major agents of change in industrialization, including national policy authorities, industrialists and policy researchers in both developed and developing countries. The present *Report* is characterized by an element of continuity with previous *Global Reports* as well as change in the approach to new challenges.

Global Report 1987 continues the practice of presenting an assessment of the current situation of and the prospects for the world industrial economy. This is done on a 10-region basis for 1987 and 1988, with a detailed breakdown of the manufacturing sector into 28 industries. This may be regarded as the unique contribution of UNIDO to the tool kit of industry analysts and decision-makers, helping to sharpen their insight into the ever-shifting perspectives of world industry. The statistical annex is designed to provide an information package on a country-by-country basis that may prove useful for practitioners in international industrial co-operation.

Global Report 1987 marks a shift of emphasis as compared with previous *Global Reports*. It deals more with the complex realities of industrial development than with global macro-economics, although movements in macro-economic values obviously cannot be ignored. The prospects for growth continue to be uncertain, and solutions to the interrelated problems of debt, trade, payments and exchange rates remain elusive. The chief concerns of UNIDO continue to be the manifold problems of industrial development, ranging from the promotion of local small-industry entrepreneurs to assistance in the process of adjustment to the activities of transnational corporations. The multiple external shocks to which developing countries have been subjected as a result of interest rate and oil price fluctuations and slow growth in developed countries, and which have had such severe consequences for the industrial sector of developing economies, require the closest attention. The channels through which these shocks are transmitted to any particular country, their effects on industry and the response of policy-makers are all sources of valuable information for countries facing similar challenges now and in the future. The emphasis on a "sharper country focus" underlying UNIDO technical co-operation and other operational programmes represents one use of such information.

Global Report 1987 reflects the spirit of the new UNIDO in its attempt to design specific policy packages to meet the new challenges. Given the problems of global industrial development, it is legitimate for the world to ask how UNIDO plans to deal with them. Accordingly, the last chapter specifically addresses the question of the UNIDO response to the issues raised in this *Global Report*. By taking stock of its present practices and adapting them to the new priorities imposed by changing circumstances, UNIDO can carry out its mandate more effectively and play a leading role in the promotion of industrial development and co-operation.

DOMINGO L. SIAZON, Jr.
Director-General

تمهيد

نشرة الصناعة والتنمية : التقرير العالمي ١٩٨٧ هي الثالثة في سلسلة من منشورات اليونيدو السنوية التي تقدّم عرضا مجملا لحالة التصنيع في العالم . وقد أصبحت هذه النشرة تعتبر احدى قنوات الاتصال الرئيسية بين اليونيدو وسائر جهات التفبير الرئيسية في مجال التصنيع ، بما فيها السلطات الوطنية المعنية بالسياسات ورجال الصناعة والباحثون في أمور السياسة العامة في البلدان النامية والمتقدمة النمو على حدّ سواء . ويتميّز التقرير الحالي بعنصر استمراري يصله بالتقارير العالمية السابقة ، وبنهج مغاير في التصدي للتحديات الجديدة .

ويواصل التقرير العالمي ١٩٨٧ الممارسة المتبعة حتى الآن ، فيقدّم تقييما للحالة الراهنة في الاقتصاد الصناعي العالمي ولاحتمالات هذا الاقتصاد ، متناولا قطاع الصناعات التحويلية بالتحليل المفصّل بناء على ٢٨ صناعة و ١٠ مناطق لعامي ١٩٨٧ و ١٩٨٨ . وهو ما يمكن اعتباره بمثابة مساهمة فريدة من اليونيدو في اثراء عدة محلّلي الصناعات ومتخذي القرارات ، تساعدهم على زيادة قدرتهم على استبصار كنه منظورات الصناعة العالمية دائمة التغيير . ويستهدف المرفق الاحصائي توفير مجموعة معلومات عن كل بلد على حدة قد تفيد العاملين في مجال التعاون الصناعي الدولي .

ويسجّل التقرير العالمي ١٩٨٧ تحوّلا في التركيز بالمقارنة مع التقارير العالمية السابقة . فهو يتصدى للحقائق المعقدة في مجال التنمية الصناعية أكثر من تصديه للاقتصاد الكلي العالمي ، وان يكن من المتعذر دون ريب اغفال التغيّرات التي تطرأ على قيم الاقتصاد الكلي . ولا تزال احتمالات النمو غير أكيدة ، وطول المشاكل المتداخلة المتعلقة بالديون والتجارة والمدفوعات وأسعار الصرف بعيدة المنال . ولا تزال اهتمامات اليونيدو الرئيسية تتجه الى المشاكل المتنوعة المتعلقة بالتنمية الصناعية ، بدءا بتشجيع المتعهدين المحليين للصناعات الصغيرة حتى المساعدة في عملية التكيّف مع أنشطة الشركات عبر الوطنية . ولا بد من التصدي بكل اهتمام للصدمات الخارجية المتعدّدة التي تعرّضت لها البلدان النامية بفعل التقلّبات في أسعار الفائدة وأسعار النفط والنمو البطيء في البلدان المتقدمة النمو ، الأمر الذي كان له عواقب وخيمة على القطاع الصناعي في الاقتصادات النامية . وتعتبر القنوات التي تنتقل هذه الصدمات عبرها الى أي بلد معيّن ، وما ترتبه من آثار على الصناعة ، وردّ فعل مقرّري السياسات بهذا الصدد ، بمثابة مصادر معلومات ثمينة للبلدان التي تواجه تحدّيات مماثلة حاضرا ومستقبلا . ومن فوائد هذه المعلومات تشديد برامج اليونيدو للتعاون التقني وغيرها من البرامج الميدانية على "زيادة التركيز على البلدان" .

ويجسّد التقرير العالمي ١٩٨٧ روح اليونيدو الجديدة في معاولته تقديم مجموعات نوعية محدّدة من السياسات لمواجهة التحدّيات الجديدة . ومن حق العالم ، بالنظر الى ما تتعرّض له التنمية الصناعية العالمية من مشاكل ، أن يسأل اليونيدو كيف تنوي التصدي لها . وبناء على ذلك ، فان الفصل الأخير يتناول بالتحديد المسألة المتعلقة باستجابة اليونيدو للقضايا المثارة في هذا التقرير العالمي . وباستطاعة اليونيدو ، اذا ما قيّمت ممارستها الحالية من جميع نواحيها وطوّعتها لأولويات الجديدة التي يفرضها تغيّر الظروف ، أن تنهض بمهمتها بمزيد من الفعالية وأن تقوم بدور ريادي في تعزيز التنمية والتعاون في الميدان الصناعي .

دومينغو ل. سيازون ، الابن
المدير العام

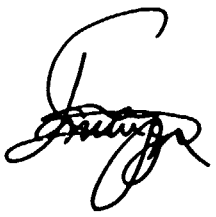
序 言

《工业与发展：1987年全球报告》系工发组织每年一度总览全球工业化情况的第三期报告。 这一出版物业已逐渐成为工发组织与工业化变革中的其他重要机构之间相互联系的主要渠道之一。联系的对象包括发达国家和发展中国家的国家决策当局、工业家以及政策研究人员。 本报告的特点是既保持了与前一期报告之间的连续性，又针对各种新挑战采取了不同的办法。

《1987年全球报告》继续采取对世界工业经济现状及其前景进行评估的做法。 这是根据1987和1988年十个区域的情况，将制造业部门划分成28种工业，分别予以详细审查。 这可以算是工发组织为方便工业分析人员和决策者的工作所作的特殊贡献，有助于他们更加深刻地理解世界工业不断变化的前景。 本报告的统计附件的用意是为从事国际工业合作的人员提供一套按国家分列的有益资料。

与前两期《全球报告》相比，《1987年全球报告》的重点有所改变，更加侧重工业发展的复杂现实，而不是全球的宏观经济状况，尽管宏观经济的变化明显不容忽视。 经济增长的前景仍难预料，涉及债务、贸易、支付以及汇率等彼此相互关联的问题亦仍未获解决。 工发组织关注的主要问题仍然是涉及工业发展的多重问题，范围从促进当地小型工业企业家的发展，到帮助适应跨国公司的活动。 由于汇率和石油价格的波动以及发达国家增长缓慢等因素，发展中国家遭受了来自外部的多种冲击，使得其经济中的工业部门承受了严重的后果；所有这些情况都应受到密切的注意。 这些冲击是通过何种渠道传入某一国家，其对工业产生的效果如何，决策人员如何反应，有关的资料对于那些目前以及今后面临类似挑战的国家是十分宝贵的。 工发组织技术合作方案和其他业务活动方案强调“更加精确的国家焦点”，便体现出对这类资料的应用。

《1987年全球报告》反映出新工发组织试图针对各种新挑战设计一套具体政策的精神。 面对全球工业发展中存在的各种问题，人们有理由询问工发组织计划如何加以解决。 因此，在最后一章中具体谈到工发组织对本《全球报告》提出的问题所作出的反应。 通过对其目前的做法的检查，并使之适应由于不断变化的形势而产生的新的优先目标，工发组织可以更加有效地完成其使命，在促进工业发展与合作的过程中发挥主导作用。



总干事

小多明哥·L·夏松

Préface

Le document *Industrie et développement dans le monde, Rapport 1987* est la troisième livraison d'une publication annuelle de l'ONUDI consacrée à des études de l'industrialisation dans le monde. Cette publication est maintenant considérée comme un des principaux moyens de communication entre l'ONUDI et tous les autres grands agents du changement dans le domaine de l'industrialisation, pouvoirs publics, industriels et analystes, dans les pays développés comme dans les pays en développement. Le *Rapport 1987* s'inscrit certes dans la continuité des rapports précédents, mais il adopte aussi une approche nouvelle de problèmes nouveaux.

Le *Rapport 1987*, comme ses prédécesseurs, présente une évaluation de la situation actuelle et des perspectives de l'industrie mondiale. Pour cette évaluation, on a retenu une répartition en 10 régions pour 1987 et 1988; le secteur manufacturier a été quant à lui divisé en 28 branches d'industrie. Le résultat doit être considéré comme un outil unique en son genre qui viendra s'ajouter à ceux dont disposent les analystes et décideurs industriels et leur donnera une vision plus nette des perspectives en évolution constante de l'industrie mondiale. L'annexe statistique présente une somme d'informations classées par pays, qui pourra se révéler utile aux praticiens de la coopération industrielle internationale.

Les orientations du *Rapport 1987* sont différentes de celles des livraisons précédentes. Le *Rapport 1987* traite en effet davantage des réalités complexes de l'industrialisation que des aspects macro-économiques généraux, encore qu'il soit naturellement impossible de négliger l'évolution des valeurs macro-économiques. Les perspectives de la croissance restent incertaines et il n'apparaît toujours pas de solutions aux problèmes connexes de la dette, des échanges, des paiements et des taux de change. L'ONUDI continue de se préoccuper au premier chef des multiples problèmes que pose l'industrialisation, qu'il s'agisse de la promotion des petites entreprises locales ou d'une assistance à l'ajustement aux activités des sociétés transnationales. Les multiples chocs extérieurs qu'ont subis les pays en développement du fait des fluctuations des taux d'intérêt et des prix pétroliers et de la faiblesse de la croissance dans les pays développés, chocs qui ont eu des conséquences très graves pour le secteur industriel des pays en développement, doivent être étudiés très attentivement. La manière dont ces chocs se répercutent sur tel ou tel pays, leurs incidences sur l'industrie et les mesures prises par les décideurs pour y faire face constituent autant de renseignements précieux pour les pays qui se heurtent ou se heurteront a des problèmes similaires. C'est notamment sur la base de tels renseignements que l'on a pu mettre davantage l'accent sur les pays eux-mêmes dans les programmes de coopération technique de l'ONUDI et dans ses autres programmes opérationnels.

Le *Rapport 1987* est à l'image de la nouvelle ONUDI, qui s'attache à concevoir des politiques appropriées aux nouveaux défis. Etant donné les problèmes de l'industrialisation mondiale, le monde est légitimement en droit de demander à l'ONUDI comment elle compte y faire face. Aussi le dernier chapitre traite-t-il expressément de la réponse apportée par l'ONUDI aux questions soulevées dans le *Rapport*. En dressant l'inventaire de ses pratiques actuelles et en les adaptant aux nouvelles priorités qu'impose l'évolution de la situation, l'ONUDI pourra s'acquitter plus efficacement de son mandat et être un élément moteur de la promotion de l'industrialisation et de la coopération.

Le Directeur général,

DOMINGO L. SIAZON, Jr

Предисловие

Промышленность и развитие: Глобальный доклад за 1987 год является третьим по счету в серии проводимых ЮНИДО ежегодных обзоров мирового положения в области индустриализации. Он представляет собой издание, которое превратилось в один из основных каналов связи между ЮНИДО и всеми другими главными действующими силами процесса индустриализации, включая национальные директивные органы, промышленников и специалистов по вопросам промышленной политики в развитых и развивающихся странах. Для настоящего *Доклада* характерен элемент преемственности с предыдущими *Глобальными докладами*, но вместе с тем он отражает и некоторые изменения в подходе к решению новых задач.

В *Глобальном докладе за 1987 год* сохранена практика представления оценки текущего положения в мировой промышленной экономике и перспектив ее развития. Такая оценка дана по десяти регионам на 1987 и 1988 годы с подробной разбивкой сектора обрабатывающей промышленности на 28 отраслей. Его можно считать своеобразным вкладом ЮНИДО в арсенал средств, имеющихся в распоряжении у специалистов по вопросам анализа состояния промышленности и у директивных органов, который поможет им глубже изучать постоянно изменяющиеся перспективы развития мировой промышленности. В статистическом приложении содержится комплекс информации по странам, которая может оказаться полезной для сторон международного промышленного сотрудничества.

По сравнению с предыдущими *Глобальными докладами* в новом *Глобальном докладе за 1987 год* произошел определенный сдвиг акцентов. В нем больше внимания уделяется сложным реальностям процесса промышленного развития, а не особенностям глобальной макроэкономики, хотя, несомненно, полностью игнорировать изменения макроэкономических факторов нельзя. Перспективы роста попрежнему неопределенны, а взаимосвязанным проблемам задолженности, торговли, платежей и обменных курсов, как и ранее, не удается найти решения. Основными вопросами, представляющими особый интерес для ЮНИДО, продолжают оставаться проблемы промышленного развития, охватывающие самые различные аспекты — от содействия местным мелким предпринимателям до оказания помощи в процессе промышленной перестройки, которая определяется деятельностью транснациональных корпораций. Пристального внимания заслуживают и многочисленные внешние факторы, потрясающие экономику развивающихся стран в результате колебаний учетных ставок и цен на нефть и низких темпов роста экономики развитых стран, которые имели очень серьезные последствия для промышленного сектора развивающихся стран. Каналы, по которым эти факторы воздействуют на конкретные страны, их последствия для промышленности и меры, принимаемые в связи с ними директивными органами, представляют собой элементы ценной информации для стран, которые имеют аналогичные проблемы в настоящее время или столкнутся с ними в будущем. Уделение особого внимания отдельным странам, что характерно для технического сотрудничества ЮНИДО и других оперативных программ, является одним из следствий использования такой информации.

Глобальный доклад за 1987 год является отражением общего направления деятельности новой ЮНИДО, которая пытается разработать комплексы конкретных мер, предназначенных для решения вновь возникающих задач. Учитывая проблемы глобального промышленного развития, страны мира с полным основанием могут спросить, каким образом ЮНИДО планирует решать их. В связи с этим, в заключительной главе конкретно рассматривается вопрос о мерах, которые принимаются ЮНИДО в отношении проблем, изложенных в настоящем *Глобальном докладе*. Используя весь арсенал своих практических средств применительно к возникающим новым приоритетным задачам, вызванным изменяющимися условиями, ЮНИДО в состоянии более эффективно выполнять свой мандат и играть ведущую роль в содействии промышленному развитию и сотрудничеству.

ДОМИНГО Л. СИАЗОН, МЛ.
Генеральный директор

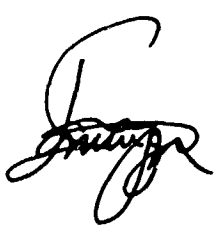
Prefacio

Industry and Development: Global Report 1987 (Industria y desarrollo: Informe mundial 1987) es el tercer volumen de la serie de exámenes anuales del panorama de industrialización en el mundo publicada por la ONUDI. Se trata de una publicación que ha llegado a considerarse como uno de los más importantes cauces de comunicación entre la ONUDI y todos los demás agentes principales del cambio en la industrialización, entre ellos los órganos normativos nacionales, los industriales y los investigadores de políticas de países tanto desarrollados como en desarrollo. El presente *Informe* se caracteriza por un elemento de continuidad con los informes anteriores, así como por un cambio en la forma de abordar las nuevas dificultades.

El *Informe* correspondiente a 1987 presenta, como en años anteriores, una evaluación de la situación en que se encuentra la economía industrial mundial y de sus perspectivas. Esta presentación se hace con respecto a diez regiones en los años 1987 y 1988, con un desglose detallado del sector manufacturero en 28 industrias. Ésta podría considerarse como la contribución realmente única de la ONUDI al instrumental de los analistas de la industria y de los órganos de decisión, para que puedan tener una visión más aguda de las perspectivas en constante mutación de la industria mundial. El anexo estadístico tiene por objeto ofrecer un conjunto de informaciones, por países, que pueda resultar útil a los profesionales en el ámbito de la cooperación industrial internacional.

El *Informe mundial 1987* se caracteriza por un desplazamiento del interés con respecto a los informes anteriores. Se ocupa más de las complejas circunstancias del desarrollo industrial que de la macroeconomía mundial aunque, por supuesto, no puede pasar por alto los movimientos de los valores macroeconómicos. Las perspectivas de crecimiento siguen siendo inciertas y aún es difícil encontrar soluciones para los problemas interrelacionados de la deuda, el comercio, los pagos y los tipos de cambio. La ONUDI sigue preocupándose principalmente por los diversos problemas del desarrollo industrial, desde la promoción de las pequeñas empresas industriales en el plano local, hasta la asistencia en el proceso de ajuste de las actividades de las empresas transnacionales. Los múltiples impactos externos que han sufrido los países en desarrollo como consecuencia de las fluctuaciones de los tipos de interés y del precio del petróleo, así como de la desaceleración del crecimiento en los países desarrollados, que tan graves consecuencias han tenido para el sector industrial de las economías en desarrollo, merecen la más profunda atención. Los canales a través de los que se transmiten esos impactos a determinados países, su repercusión en la industria y la respuesta de los órganos normativos constituyen fuentes de valiosa información para los países con dificultades análogas ahora y en el futuro. El hincapié en una atención más marcada a los países, en que se basa la cooperación técnica de la ONUDI y de otros programas operacionales, ilustra una de las posibles aplicaciones de esa información.

El *Informe mundial 1987* refleja el espíritu de la nueva ONUDI en su intento de elaborar conjuntos de medidas concretas para hacer frente a las nuevas dificultades. Dados los problemas de la industrialización mundial, es legítimo que la comunidad internacional se pregunte de qué forma se propone la ONUDI abordarlos. En consecuencia, el último capítulo se ocupa especialmente de la respuesta de la ONUDI a las cuestiones planteadas en este *Informe mundial.* Evaluando sus prácticas actuales y adaptándolas a las nuevas prioridades impuestas por las circunstancias cambiantes, la ONUDI podrá cumplir su mandato con más eficacia y desempeñar un papel rector en el fomento del desarrollo industrial y la cooperación.



DOMINGO L. SIAZON, Jr.
Director General

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EXPLANATORY NOTES

References to dollars ($) are to United States dollars, unless otherwise stated.

References to tonnes are to metric tonnes, unless otherwise specified.

A slash (1980/1981) indicates a crop year or a financial year.

References to ISIC codes are accompanied by a descriptive title (for example, ISIC 323: "Manufacturing of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel"). Considerations of space, however, may require a shortening of this description (for example, ISIC 323 may be referred to simply as "Leather and fur products"). In some cases, ISIC categories have been aggregated and the description titles adjusted accordingly.

The term "billion" signifies a thousand million.

The term "trillion" signifies a thousand billion.

For information on member countries comprising a region (e.g. North Africa and Western Asia), see the statistical annex.

The following symbols have been used in tables:

Three dots (. . .) indicate that data are not available or are not separately recorded.

A dash (—) indicates that the amount is nil or negligible.

Totals may not add precisely because of rounding.

The following technical abbreviations are used in this publication:

CAD	computer-aided design
CAM	computer-aided manufacturing
ICOR	incremental capital-output ratio
mbd	million barrels per day
PVC	polyvinyl chloride
PET	polyethylene terephthalate

The following abbreviations and acronyms appear in this publication:

ASEAN	Association of South-East Asian Nations
CMEA	Council for Mutual Economic Assistance
EEC	European Economic Community
EFTA	European Free Trade Association
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organization of the United Nations
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GNP	gross national product
IMF	International Monetary Fund
ISIC	International Standard Industrial Classification of all Economic Activities
MFA	Multifibre Arrangement
MVA	manufacturing value added
NMP	net material product
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of Petroleum Exporting Countries
PTA	Preferential Trade Area for Eastern and Southern Africa
SABIC	Saudi Basic Industries Corporation
SDR	special drawing right
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHO	World Health Organization

This report is based on information available as of March 1987.

Introduction: the structure of this *Report*

UNIDO forecasts for industrial development in developing countries assume two further years of moderate growth in the world economy. Since this assessment is contingent upon changing international economic conditions, chapter I deals with some of the emerging trends and issues that have important implications for the industrialization efforts of developing countries in the immediate future.

In chapter II the UNIDO assessment of the current economic situation and forecasts for 1987 and 1988 are presented. As in *Global Report 1986*, growth forecasts for gross domestic product (GDP) and manufacturing value added (MVA) take the form of regional aggregates. Recent trends in industrial development and related policy measures in some of the major countries in each region are also described. The aim of chapter II is therefore to look ahead and indicate the possible future configuration of the changing global industrial landscape.

Chapter III examines the impact of the severe economic environment of the 1980s on the manufacturing sector of developing countries. Throughout this period, developing countries have been subjected to numerous external economic shocks, in particular, declining primary product prices, worsening terms of trade, rising oil prices in 1980 and their precipitous fall in 1985, the global recession of 1980-1982, the debt crisis and the instability of interest and exchange rates. As its special theme this *Global Report* examines the ways in which these economic shocks have affected the manufacturing sector of developing countries and the policy responses introduced to cope with them.

Chapter III also includes a quantitative assessment of the potential output and employment foregone by 20 countries as a result of the external economic shocks. The effects of an import squeeze on capital formation and capacity utilization are traced in some detail. But numbers never tell the full story. The quantitative assessment is supplemented by an account of the policy responses of four developing countries, namely Nigeria, Peru, the Philippines and Sri Lanka. It describes how those countries sought to rally internal and external support for their austerity measures.

Following past practice again, the implications of the forecasts for 28 industries are presented in chapter IV. An attempt is made to provide information on each of these branches in a fairly uniform manner. Under the heading "the present situation", recent progress made in raising the developing countries' share of world production in industry is monitored. Under "future prospects", short-term regional projections are presented for each industry. This is followed by a descriptive account of the prospects for future growth in domestic demand and exports and of expected advances in technology. A special feature of this *Report* is the inclusion of an account of UNIDO activities in these various branches. This will help readers to see how UNIDO activities relate to the industrialization efforts of developing countries.

After a brief recapitulation, the role of UNIDO in the process of global industrialization is described in chapter V. This is in line with the basic aim of the *Global Report* to serve as a convenient channel for UNIDO to communicate with "agents of change" in industrialization so as to achieve a common perception of the problems confronting different regions of the world, to provide some guidance for future action, and to clarify the priorities of international industrial co-operation.

The statistical annex provides detailed data on individual countries. As in previous *Global Reports*, an attempt is made to give the fullest possible coverage in each case. It is hoped that such data will continue to be useful to our readers.

I. World industrial restructuring and redeployment: an overview of the current features and issues

Industrialization is not, nor has it ever been, a simple process. The Industrial Revolution did not long remain the monopoly of a single country nor even a single region. As successive industrial revolutions spread to new areas, the complex and challenging problems of adapting to new technological possibilities and a shifting international economic environment are brought home to new generations of policy-makers. Countries of the South have now entered such a phase of adjustment. From palm-oil to steel, from footwear to software, developing countries have proved in the last decade and a half that they are capable not just of producing an increasing range of industrial products, but of producing them at internationally competitive prices. The entry of developing countries into the world's production stream has, however, coincided with a prolonged slow-down in the world economy, and has become not only an irritant to competitors in developed countries, but a price-depressing factor in itself. Not long ago supply constraints seemed to be the major barrier, but today, developing countries are experiencing a new problem—how to find enough buyers for those goods for the production of which they have invested so much and acquired new skills and technologies. The irony is that developing countries, having incurred huge external debts to finance their new industrial plants, now have no option but to continue production in order to service their debt obligations, thus further increasing the world-wide glut in many types of manufactures that but a decade ago had good prospects.

Industrialization is not a short-term phenomenon; it requires the cumulative efforts of several generations. However, an appreciation of how the overall structure of world industry is changing from year to year is becoming increasingly important, and the changes that have occurred over the past few years have been particularly significant. The forecasts presented below are based on an analysis of those changes.

In *Global Report 1986*, UNIDO presented short-term industrial forecasts for the first time. Those forecasts turned out to have been fairly accurate. Despite the margins of error inherent in forecasting, such an exercise is a useful tool for the identification and analysis of major problems and their possible solutions. This tool will be once again applied in the present *Report*.

Summary forecasts for 1987 and 1988 are given in figures I, II and III.* Overall, the world economy is expected to grow by 3.2 per cent in 1987 and 3.5 per cent in 1988. Detailed forecasts for 1987 and 1988 are given in the following chapters. They are first grouped in terms of 10 economic regions in chapter II, and then organized in terms of 28 specific industrial branches in chapter IV. The background against which current events have to be viewed and their impact on the general industrialization efforts of developing countries are considered in the present chapter.

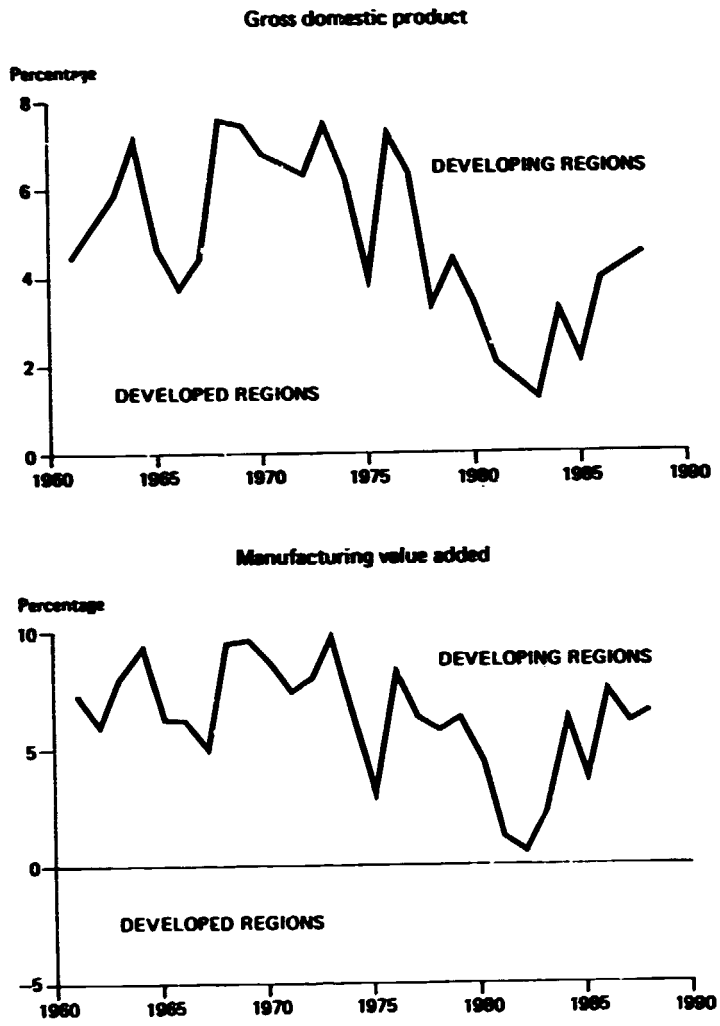
A. The outlook for the world industrial economy

In 1987, the world economy seems to be entering its fifth consecutive year of recovery. The average growth rate, however, is hardly impressive. Relative to their growth trend rate over the last 20 years, the growth performance of the seven biggest industrial countries has been below par since 1980. Although recovered from the deep recession of 1982, these economies barely reached the growth trend rate in 1985, and have remained slightly below that line since then. It is not so much a recession as a pause that has characterized 1986 and 1987. The uncertainty that surrounds the global economy concerns the next stage: will there be an acceleration of growth, a continuation of the pause or a slide into another recession? Agriculture, natural-resource-based industries and manufacturing have all experienced a decline in earnings and, in their respective ways, have undergone "partial recessions". Indeed, the industry-wide restructuring in manufacturing accompanying a genuine economy-wide recession seems nearly completed in the United States of America and is currently under way in Japan and Europe. UNIDO, in projecting a recession-free world economy for another two years, is counting heavily on these extensive restructuring efforts to provide an impetus for growth in developed countries.

Many urgent problems continue, however, to plague the world community, which has failed to come to grips with them not for want of solutions, but because of the difficulty of obtaining the global political consensus required to ensure the success of those

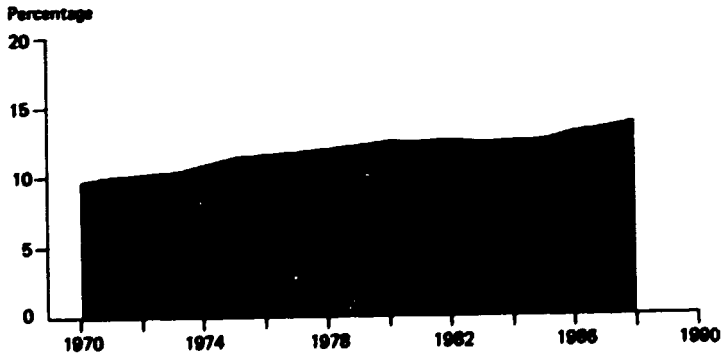
*Also see box "Regional and country growth rate estimates of GDP and MVA for 1987 and 1988 and estimated share of industrial output of developing countries in world total in 1975 and 1988".

Figure I. Growth rates of GDP and MVA in developed and developing regions, 1963-1988



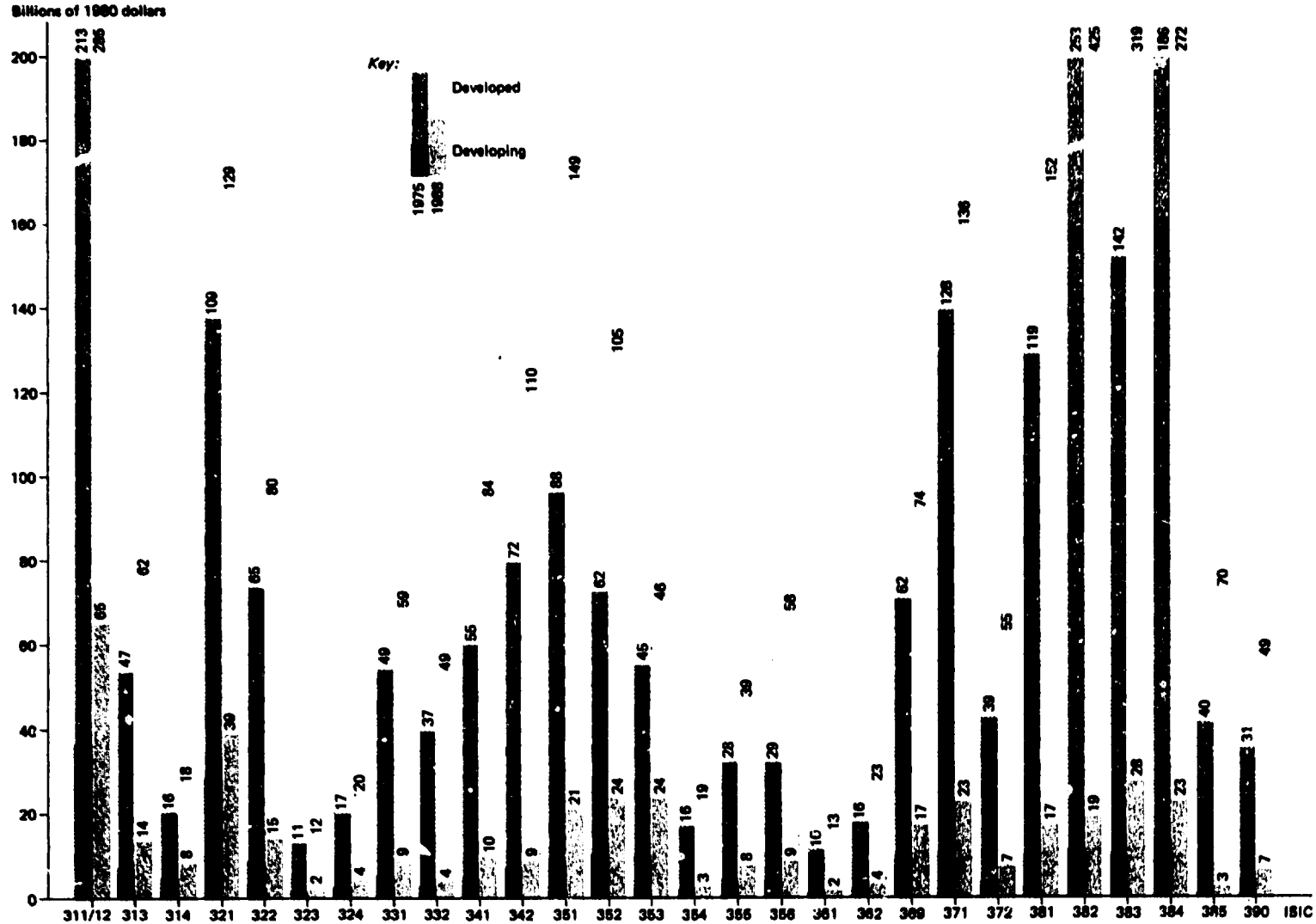
Sources: United Nations National Accounts Statistics; United Nations Industrial Statistics.

Figure II. Manufacturing share of developing countries in world industrial output



Sources: United Nations National Accounts Statistics; United Nations Industrial Statistics.

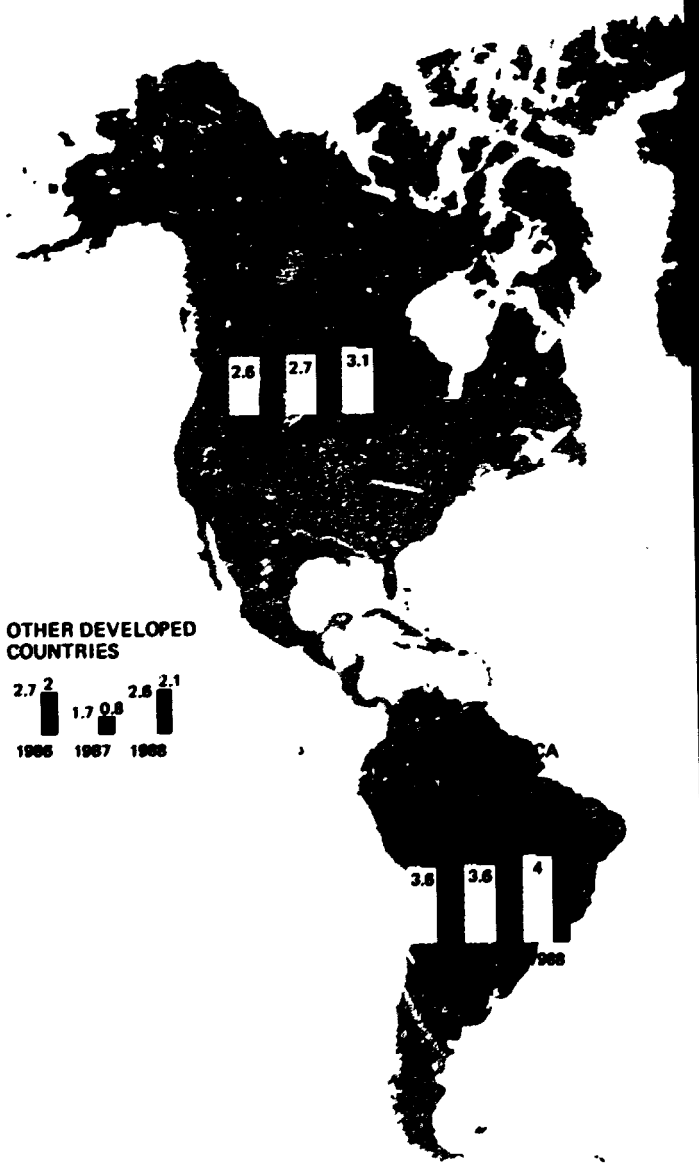
Figure III. Manufacturing output of North and South
(Billions of 1980 dollars)



Sources: United Nations National Accounts Statistics; United Nations Industrial Statistics.

Regional and country growth rate estimates of GDP and MVA for 1986, projections for 1987 and

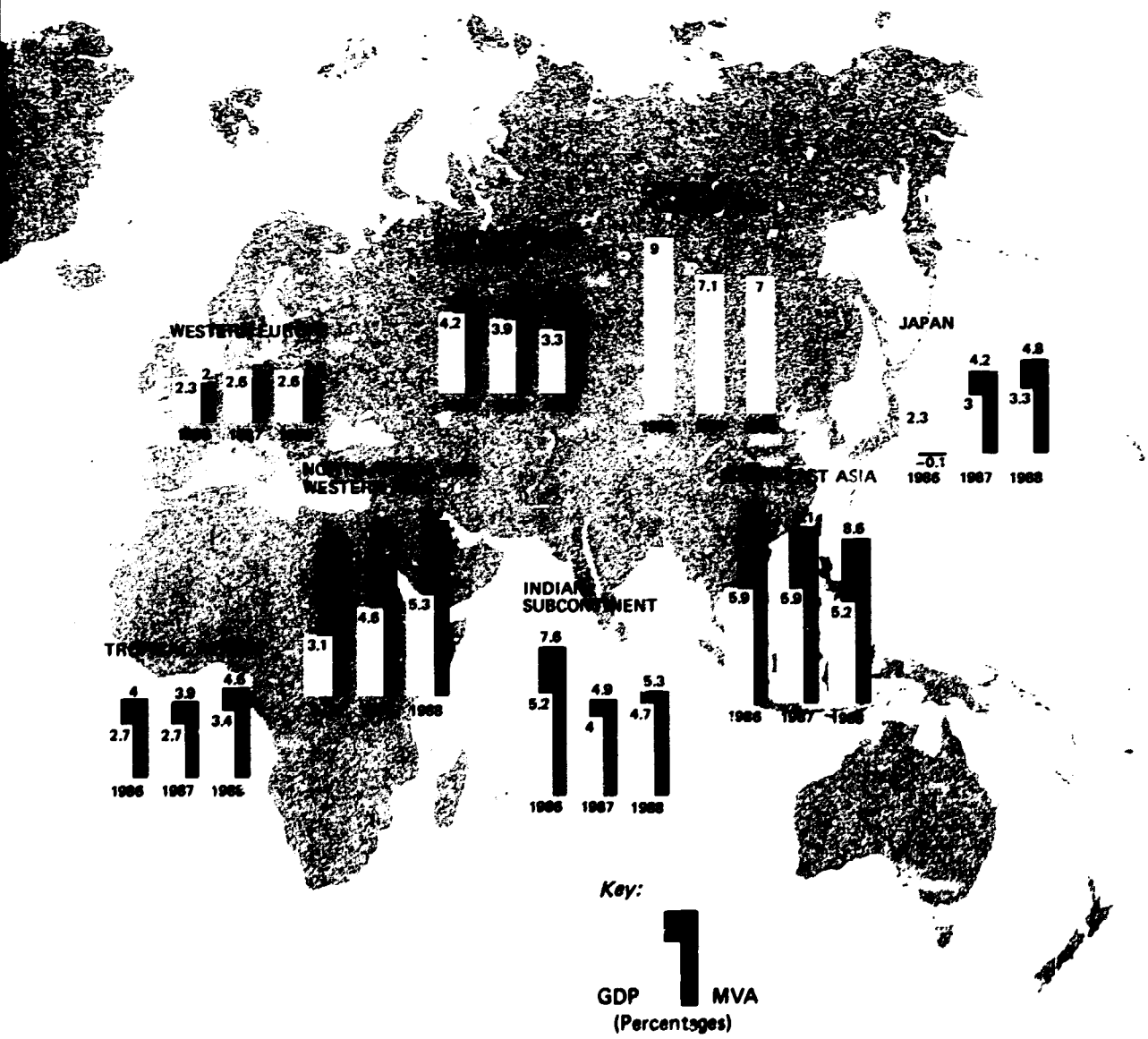
Regions, countries and areas	GDP growth rates (percentage)			MVA growth rates (percentage)		
	1986	1987	1988	1986	1987	1988
North America	2.6	2.7	3.1	1.1	2.8	3.3
Bermuda	1.0	1.8	1.7	3.8	3.6	3.3
Canada	3.4	3.0	2.9	0.9	2.3	2.5
Puerto Rico	2.2	2.2	2.1	5.2	5.6	5.2
United States	2.5	2.7	3.1	1.1	2.8	3.3
Western Europe	2.3	2.6	2.6	2.0	2.2	2.3
Austria	2.1	2.4	2.7	1.3	2.7	3.3
Belgium	1.9	1.9	2.4	2.1	2.5	3.1
Denmark	3.4	0.5	2.3	4.0	0.9	2.9
Finland	1.5	1.6	2.2	0.5	1.5	2.0
France	2.0	2.2	2.4	1.1	1.7	2.1
Germany, Fed. Rep. of	2.5	2.8	2.4	2.1	2.7	2.1
Greece	0.2	3.3	3.4	−0.3	2.3	4.2
Iceland	6.0	2.0	0.4	4.0	[illegible]	0.4
Ireland	1.2	2.6	3.1	3.1	[illegible]	5.3
Israel	1.7	3.7	4.8	−1.3	4.0	4.6
Italy	2.8	3.2	3.3	3.2	3.7	3.9
Luxembourg	2.4	3.0	2.7	2.5	5.1	4.6
Malta	1.5	2.2	[illegible]	1-2	2.0	3.0
Netherlands	1.5	2.5	2.9	1.1	1.1	1.1
Norway	3.5	2.3	1.7	1.2	0.3	0.0
Portugal	4.2	4.2	3.2	1.7	5.7	4.2
Spain	2.7	3.0	3.1	2.8	3.2	3.3
Sweden	1.4	1.8	2.1	2.5	1.4	2.6
Switzerland	2.6	2.1	[illegible]	2.0	1.3	1.5
United Kingdom	2.3	2.9	2.3	1.4	0.2	0.6
Yugoslavia	2.0	3.3	3.5	5.2	4.7	5.0
Japan	2.3	3.0	3.3	−0.1	4.2	4.8
Other developed countries	2.7	1.7	2.6	2.0	0.8	2.1
Australia	4.0	1.0	2.4	3.2	−1.0	0.8
New Zealand	1.0	2.1	1.0	2.6	3.1	2.3
South Africa	0.4	3.1	3.6	−0.7	3.8	4.7
Centrally planned Europe incl. USSR	4.2	3.9	3.3	5.0	5.0	4.7
Albania	2.9	3.1	3.2	5.8	5.9	6.0
Bulgaria	5.5	5.3	5.3	10.5	...	...
Czechoslovakia	3.2	3.1	2.8	3.0	3.8	3.5
German Dem. Rep.	4.3	4.6	4.6	4.3	5.0	5.2
Hungary	0.5	4.2	4.8	1.6	5.1	5.0
Poland	5.0	4.0	3.5	5.2	4.6	4.1
Romenia	7.3	5.9	4.3	8.7	7.6	6.1
USSR	4.1	3.7	3.0	4.9	4.9	4.5
Caribbean and Latin America	3.6	3.6	4.0	6.7	4.4	5.2
Argentina	5.5	3.6	4.0	14.1	6.1	6.8
Bahamas	2.5	...	...	2.7	...	...
Barbados	3.0	2.9	2.3	14.2	4.6	4.0
Belize	2.2	3.2	3.1	3.9	5.1	5.0
Bolivia	−3.5	1.9	3.0	−9.1	4.1	2.7
Brazil	8.0	5.6	3.9	11.0	5.7	3.4
Chile	5.0	5.5	3.3	7.4	4.8	2.2
Colombia	5.3	3.6	4.0	5.8	3.1	3.9
Costa Rica	3.0	4.1	4.1	3.8	5.3	5.4
Cuba	0.7	2.6	3.6	1.1	3.0	4.2
Dominican Republic	0.5	2.4	2.6	−1.1	1.2	1.3
Ecuador	1.7	2.5	2.8	3.6	5.0	5.2
El Salvador	0.5	2.7	4.0	−0.2	2.3	3.9
French Guiana	1.6	2.0	2.5	3.5	3.8	4.3
Guadeloupe	3.7	3.0	2.7	...	...	...
Guatemala	0.0	3.2	4.4	−0.6	3.3	4.8
Guyana	1.6	1.7	1.7	...	...	...
Haiti*	−1.5	1.5	2.0	−3.2	2.7	3.2
Honduras	2.0	2.4	2.6	1.8	2.2	2.4
Jamaica	2.5	1.6	2.3	2.4	1.1	1.8
Martinique	2.6	2.2	2.0	...	...	...
Mexico	−3.1	1.1	5.0	−1.4	1.7	8.6
Montserrat	4.3	2.8	2.8	8.6	6.4	7.0
Netherlands Antilles	2.0	1.7	1.5	...	...	...
Nicaragua	0.0	0.5	1.5	1.5	1.9	2.8
Panama (excl. Canal Zone)	2.8	3.4	2.3	1.1	1.4	0.9
Paraguay	1.0	1.0	2.7	−0.5	−0.5	1.5
Peru	8.5	5.2	4.1	10.1	5.4	3.9
Suriname	0.2	3.6	1.9	...	...	...
Trinidad and Tobago	−8.1	−0.5	7.0	...	...	...
Uruguay	5.1	4.3	2.1	6.1	4.6	1.8
Venezuela	3.1	3.0	3.3	5.5	3.6	4.9
Tropical Africa (Sub-Sahara)	2.7	2.7	3.4	4.0	3.9	4.6
Benin*	1.6	2.1	2.1	−0.3	0.0	0.0
Botswana*	5.0	5.0	...	...	...	...
Burkina Faso*	3.2	2.7	2.9	−1.0	1.6	1.9
Burundi*	1.9	5.4	0.4	5.7	8.0	4.7
Cameroon	4.8	3.2	2.5	4.5	2.9	2.2
Cape Verde*	1.1	1.1	1.2	...	...	...
Central African Rep.*	2.3	1.0	...	4.4	2.7	...
Chad*	−0.9	−0.8	...	...	...	...



1988 and estimated share of industrial output of developing countries in world total in 1975 and 1988

Regions, countries and areas	GDP growth rates (percentage)			MVA growth rates (percentage)		
	1986	1987	1988	1986	1987	1988
Comoros*	2.2	2.1	2.2	...	...	...
Congo	0.2	3.5	...	−2.3	0.6	...
Côte d'Ivoire	4.1	5.1	4.5	3.6	5.4	4.8
Djibouti*	2.4	2.4	2.4	2.1	2.2	2.2
Equatorial Guinea*	2.0	2.1	...	...	...	...
Ethiopia*	−0.8	2.0	2.6	1.5	3.3	3.8
Gabon	3.9	8.5	8.9	...	...	...
Gambia*	6.4	1.9	1.6	...	...	...
Ghana	5.3	5.0	2.0	7.3	7.6	1.1
Guinea*	2.5	1.3	2.0	2.8	2.1	2.6
Guinea-Bissau*	1.3	2.3	1.5	1.0	1.3	1.2
Kenya	5.3	3.1	3.3	9.3	5.9	6.3
Lesotho*	5.8	6.0	6.0	...	...	...
Liberia	1.6	2.0	2.1	2.7	3.5	4.0
Madagascar	3.0	0.1	...	4.7	0.9	...
Malawi*	2.9	3.5	3.4	5.3	6.2	6.3
Mali*	3.9	3.5	2.7	2.3	1.9	1.0
Mauritania*	4.0	−0.2	1.0	...	...	...
Mauritius	5.5	−0.9	2.4	8.2	1.0	4.7

Regions, countries and areas	GDP growth rates (percentage)			MVA growth rates (percentage)		
	1986	1987	1988	1986	1987	1988
Mozambique	−4.9	0.5	0.9	−9.3	−0.2	0.6
Namibia	3.7	5.5	6.4	...	...	...
Niger*	3.2	3.6	3.0	...	...	...
Nigeria	1.5	1.7	3.4	4.8	5.0	6.3
Reunion	5.4	5.5	...	4.0	3.7	...
Rwanda*	2.8	2.8	2.9	...	...	...
Sao Tome and Principe*	1.8	1.2	0.0	3.1	2.2	1.1
Senegal	2.1	2.4	2.4	6.2	3.6	5.1
Seychelles	3.4	3.5	3.6	...	...	...
Sierra Leone*	3.0	3.3	3.3	2.5	2.8	2.9
Somalia*	3.8	3.8	...	...	...	...
Swaziland	4.8	3.7	3.2	6.6	5.3	4.8
Togo*	5.2	3.9	1.9	0.6	0.0	−0.8
Uganda*	6.9	5.8	5.1	7.8	5.9	4.7
United Rep. of Tanzania*	3.3	2.2	3.0	1.9	−0.3	1.7
Zaire	2.4	2.6	2.6	−1.1	−0.6	−0.4
Zambia	2.6	3.4	3.4	−1.1	4.2	4.2
Zimbabwe	0.0	−3.0	1.9	−0.6	−3.1	1.0



Regional and country growth rate estimates of GDP and MVA for 1986, projections for 1987 and 1988 and estimated share of industrial output of developing countries in world total in 1975 and 1988 *(continued)*

Regions, countries and areas	GDP growth rates (percentage)			MVA growth rates (percentage)		
	1986	1987	1988	1986	1987	1988
North Africa	3.1	4.4	4.8	5.7	6.9	7.1
Algeria	3.3	4.0	4.1	9.4	9.6	9.7
Egypt	4.5	5.8	6.5	4.2	5.0	5.7
Libyan Arab Jamahiriya	2.0	4.4	5.8	11.1	13.0	13.9
Morocco	4.0	3.9	4.2	3.3	3.6	3.5
Sudan*	1.7	3.6	1.3	5.9	6.8	5.6
Tunisia	−0.9	3.5	2.8	0.8	6.9	6.0
Western Asia	3.2	4.6	5.5	8.9	9.1	9.7
Cyprus	3.0	4.8	5.0	0.0	5.9	5.7
Democratic Yemen*	1.4	1.8	1.0	5.0	5.3	5.4
Iran (Islamic Rep. of)	3.0	5.3	6.2	7.0	9.3	9.9
Iraq	1.0	3.9	4.3	...	...	...
Jordan	0.8	2.6	3.5	3.5	4.6	5.4
Kuwait	−2.9	4.8	5.2	3.5	5.5	5.6
Oman	5.5	4.5	7.2	...	...	...
Qatar	2.3	3.2	3.2	...	...	...
Saudi Arabia	3.0	4.6	5.8	7.0	7.2	7.4
Syrian Arab Republic	1.4	1.2	2.6	...	...	...
Turkey	7.0	5.8	5.4	9.5	7.8	7.2
United Arab Emirates	3.6	2.0	5.7	...	...	...
Yemen*	9.8	5.2	...	...	...	...
Indian Subcontinent	5.2	4.0	4.7	7.6	4.9	5.3
Afghanistan*	1.0	2.2	1.7	3.4	4.5	4.0
Bangladesh*	5.2	4.5	3.4	−4.0	...	...
Bhutan*	4.2	4.1	4.2	7.6	7.6	7.6
Burma	3.5	4.2	4.2	3.3	3.1	3.8
India	5.0	3.8	4.8	8.2	4.6	4.9
Nepal*	4.2	2.4	2.8	7.4	7.9	7.8
Pakistan	7.5	5.0	5.0	8.2	6.2	6.9
Sri Lanka	4.0	5.1	5.3	6.1	0.4	3.7

Regions, countries and areas	GDP growth rates (percentage)			MVA growth rates (percentage)		
	1986	1987	1988	1986	1987	1988
East and South-East Asia, Oceania	5.9	5.9	5.2	9.6	9.1	8.6
Brunei Darussalam	3.9	4.6	4.7	3.0	3.6	3.7
China (Taiwan Province)	10.8	10.4	9.3	12.5	12.7	11.1
Fiji	4.6	1.2	4.1	−7.1	−3.5	2.5
French Polynesia	3.6	3.4	3.3	5.7	5.1	5.3
Hong Kong	9.0	6.5	3.8	11.5	2.1	1.7
Indonesia	1.9	3.2	1.7	6.2	7.4	5.0
Malaysia	0.7	3.5	4.8	−1.7	1.1	3.6
Maldives*	11.7	0.0	6.6	...	...	...
New Caledonia	0.6	−0.4	1.1	0.8	1.0	1.3
Papua New Guinea	5.0	2.7	1.4	8.7	6.3	4.9
Philippines	0.1	2.2	3.7	−0.8	1.7	3.4
Republic of Korea	1.9	9.3	8.7	16.8	14.6	13.8
Singapore	1.9	3.3	2.5	−1.6	−1.0	−2.2
Thailand	3.8	3.8	3.0	5.3	5.3	4.4
Tonga	−0.6	2.0	4.6	−0.4	1.8	4.0
Vanuatu*	3.8	3.8	3.8	0.8	1.0	1.4
Centrally planned Asia	9.0	7.1	7.0	...	...	...
China	9.3	7.2	7.1	...	...	...
Democratic People's Rep. of Korea	5.2	5.2	5.2	...	...	...
Lao People's Dem. Rep.*	1.8	1.2	1.6	...	...	...
Mongolia	2.6	3.2	3.6	...	...	...
Viet Nam	4.3	3.4	2.6	...	...	...

*Least developed country.

Estimated share of developing countries in world industrial output in 1975 and 1988 and estimated annual growth rate of output in 28 industries from 1975 to 1988

(Percentages)

ISIC	Industry	Developing countries' share of world industrial output		Annual rate of growth of output			
				Developed countries		Developing countries	
		1975	1988	1975-1985	1985-1988	1975-1985	1985-1988
3	Manufacturing	11.7	13.9	3.0	3.4	4.3	6.2
311	Food products	16.7	20.6	2.3	2.7	4.4	5.2
313	Beverages	15.2	20.4	2.0	3.1	5.0	5.7
314	Tobacco products	27.0	34.6	0.9	2.6	4.3	4.7
321	Textiles	23.3	25.8	1.2	1.8	1.8	4.4
322	Wearing apparel	13.9	17.0	1.3	2.9	3.2	5.0
323	Leather and fur products	16.4	17.5	0.3	1.8	0.6	3.7
324	Footwear	16.2	20.2	0.7	2.4	2.9	4.8
331	Wood and wood products	11.4	15.2	1.4	1.9	4.0	4.8
332	Furniture and fixtures	7.9	8.8	2.1	2.8	2.7	4.0
341	Paper and paper products	9.6	12.0	3.5	3.0	5.3	6.5
342	Printing and publishing	10.2	8.3	3.4	3.3	1.0	3.8
351	Industrial chemicals	9.8	13.8	4.0	4.7	6.9	8.5
352	Other chemical products	16.2	20.5	4.1	4.3	6.5	7.0
353	Petroleum refineries	21.6	37.5	0.0	1.7	6.4	6.7
354	Miscellaneous petroleum and coal products	9.9	14.7	1.5	1.8	5.1	6.3
355	Rubber products	14.6	18.5	2.5	3.0	4.3	7.2
356	Plastic products	13.2	14.8	5.6	6.0	6.6	7.7
361	Pottery, china and earthenware	12.2	13.8	1.9	2.9	2.9	5.2
362	Glass and glass products	13.5	14.6	3.0	3.3	3.2	6.6
369	Other non-metal mineral products	14.6	21.1	1.3	2.0	4.6	7.0
371	Iron and steel	9.1	15.9	0.4	1.3	5.1	7.2
372	Non-ferrous metals	10.4	13.2	2.7	3.3	4.4	6.3
381	Metal products	9.0	11.4	2.1	1.8	3.5	6.1
382	Non-electrical machinery	4.9	4.9	4.2	3.8	3.0	7.2
383	Electrical machinery	7.6	8.9	6.7	5.7	7.6	8.7
384	Transport equipment	7.9	8.6	3.2	3.1	3.0	7.0
385	Professional and scientific equipment	3.0	4.3	4.3	4.8	7.3	7.8
390	Other manufacturing industries	13.2	13.8	3.4	4.3	3.4	6.3

Source: UNIDO data base; estimates and forecasts by UNIDO/SR/GLO.

Note: The world total of value added in the manufacturing sector is calculated from National Accounts Statistics for 166 countries. The breakdown of manufacturing output into the output of 28 branches of industry is based on the contributions suggested by industrial statistics which are available for a sample of 82 countries. These 82 countries include all developed countries and 40 countries that contribute 95 per cent of value added in manufacturing in developing countries as a group. China and other centrally planned Asian economies are excluded from the world total.

solutions. Today, the balance-of-payments difficulties and external debt problems traditionally associated with developing countries are no longer exclusively theirs. The United States is seeking a $40 billion improvement in its 1987 trade balance, probably more at the cost of imports rather than through expanded exports. If this happens, the world would be losing the expansionary impulse of the only country that has sustained world economic growth since 1982.

While developed countries are trying to streamline and reinvigorate their manufacturing sector, the structural adjustments undertaken in developing countries have been no less profound (see chapter III). Industrialization in most developing countries necessarily exposes their economies to the ups and downs of their external environment. Few developing countries have enough resources and domestic markets large enough to establish and service a reasonably balanced industrial structure. The continuing tight international credit situation and the sedentary pace of economic growth pursued by developed countries result in stagnating world trade and pose serious threats to industrialization efforts in developing countries. Nevertheless, the overall growth record of developing countries improved in 1986 and should continue to improve in 1987 and 1988, only because most developing countries have learned to look at their external constraints with sober realism.

Although it now seems so long ago, it has been only some 12 years since the Lima Declaration and Plan of Action on Industrial Development and Co-operation* was adopted and international co-operation for the industrialization of developing countries was proclaimed as the shared goal and common duty of all countries. Ironically, developing countries had, until that time, managed to achieve extremely high growth rates for their manufacturing sector. From 1960 to 1975 it had grown at an average rate of 7.6 per cent per annum, and in 1968 and 1973, for instance, it grew at over 10 per cent per annum—a remarkable performance, which gave developing countries not only the self-confidence they needed but a feeling of shared responsibility for maintaining an expanding global economy.

History, however, has frustrated the hopeful expectations of continuous growth. The manufacturing growth rate for developing countries started to slide downwards after a peak of 8.4 per cent in 1976 to 4.5 per cent in 1980, and fell to 0.6 per cent in 1982. Nevertheless, the share of developing countries in world industrial output expanded from 11.7 per cent in 1975 to 12.8 per cent in 1982,** and once the economic recovery in developing countries started, it proved to be much more resilient than in developed countries. In 1984 the growth rate of the manufacturing sector in developing countries was 6 per cent. Although the growth rate dipped again to 3.4 per cent in 1985, it strongly rebounded to 7 per cent in 1986 and the share of developing countries in world manufacturing reached 13 per cent.*

At the specific level of industrial branches, developing countries were successful in securing 31 per cent of world production of the tobacco industry, 27 per cent of the petroleum refineries industry and 21 per cent of the textiles industry. The greatest strides were made, however, in the iron and steel industry, the share of which increased from 6 to 13 per cent in the last 16 years and in the non-ferrous metals industry, the share of which increased to 11 per cent in 1986 from only 6 per cent in 1970.

With regard to future prospects, UNIDO projections indicate that about 10 industrial branches will have an above-average growth rate. Three of those branches are in the petrochemicals industry, the production capacity of which has expanded enormously during the last decade, especially in the oil-producing developing countries. The iron and steel industry will continue to expand rapidly because of the distinct cost advantage enjoyed by some developing countries. Both the electrical and non-electrical machinery industries, as well as the professional and scientific equipment industry, will grow rapidly, with an increasing number of developing countries producing and supplying not only standard machinery but also sophisticated scientific instruments.

UNIDO projections are contingent upon the changing world environment. Below are listed some aspects of the current situation which might help developing countries in the assessment of their prospects for the future:

(a) The general credit squeeze for developing countries will continue, but the worst could be over. As to the problem of past debt, the world financial community took the decision of Brazil to defer interest payments on its external debt rather calmly. At least the world community seems to recognize now that the application of sheer macro-economic restraint for the restoration of external balances implies very high long-term costs and that resumed growth is necessary to facilitate the very process of structural adjustment;

(b) The recent currency realignment among major developed market economies enhanced the cost advantage of production in developing countries. The real forces of technical change and the pursuit of increased profit will exert pressure on industrialists in developed countries to internationalize their production networks. Many developing countries have endeavoured to create a more favourable climate for foreign investments. Foreign direct investment in developing countries might, therefore, start increasing once again, if only gradually;

(c) The demand for primary products will continue to stagnate. Prices, however, will become firmer, not only because some attempts are being made by producing countries of the South to regulate production volume, but also because many producers of primary products in developed countries are finally closing down plants that are clearly no longer viable;

*Transmitted to the General Assembly by a note by the Secretary-General (A/10112). Also available as UNIDO public information pamphlet PI/38.

**These so-called Lima target share figures given in the present *Report* differ considerably from those given in last year's because of the shifting of the base year from 1975 to 1980 for all UNIDO time series data, including data for calculating industrial growth rates for the individual countries. One reason why the Lima target share figures now look bigger is that the currency exchange rates prevailing in 1980 were much more favourable to developing countries than in 1975.

*All 1986 figures given in the present *Report* are estimates based on information available up to 31 March 1987.

(d) A few developing countries that have shown signs of export dynamism in recent years have been and will continue to be subjected to political pressure from developed countries. They may, however, continue to work with international business firms confronted with increasing competition at home and abroad;

(e) Despite the recent intensive effort to reduce costs through automation in developed countries, the unit cost of industrial production generally remains lower in developing countries. The trend towards a global production network will continue and could benefit developing countries by increasing the range of their products.

All these points are dealt with more fully below. The main underlying message is not that there is no hope for the world industrial economy, but that the path to recovery lies in a more conscious effort to regain the confidence lost in recent years.

B. Prospects for renewed financial flow

The international flow of credit and capital, so abundant in the 1970s, has dried up in the 1980s and there are few signs of a major improvement in the near future. In terms of the formal concerns and mandate of UNIDO, the central aspects of the debt problem, namely capacity under-utilization and industrial rehabilitation, are the major issues. Ever since the 1982 global recession and the resulting third world debt crisis, new bank lending to developing countries has virtually ceased and foreign direct investment to those countries has also been dwindling. The declining oil revenue of member countries of the Organization of Petroleum Exporting Countries (OPEC) and budgetary restraints in many countries belonging to the Organization of Economic Co-operation and Development (OECD) countries has meant smaller aid flows, while flows from multilateral institutions have grown at best at a reduced rate. Total new financial flows to developing countries (gross flows less amortization), which amounted to approximately $102 billion in 1981, dropped to $76 billion in 1983, recovering only slightly to $85 billion in 1984, a figure that included involuntary lending of $10 billion to Mexico. The preliminary estimate for 1985 was $83 billion [1].

While the size of capital inflow to developing countries is decreasing, interest payments remain high, leaving the present net transfer of capital extremely low, or probably negative. According to preliminary figures provided by the World Bank, the total long-term credit advanced during 1984 to developing countries amounted to $86.4 billion. However, developing countries as a whole paid out $100.1 billion, consisting of $53.8 billion in interest payments and $46.3 billion in principal repayments, resulting in a reverse capital flow of $13.7 billion. An estimate by the United Nations [2] shows an alarming increase in this reverse flow ($31 billion in 1985) because of the steadily declining amounts of new loans to developing countries. A reverse flow of such magnitude cannot continue when the only source of the flow is the debtor countries' declining export earnings, which they seem powerless to control. At the same time, the credit rating of developing countries is worsening. Nevertheless, it is legitimate to ask whether the alarm over third world debt is justified.

In February 1987 the Government of Brazil suspended interest payments on $68 billion of long-term debt after a sudden slump in Brazil's foreign trade surplus and difficulties in holding down domestic prices. The reactions on the international financial markets were surprisingly sanguine with no sign of the long-dreaded world-wide financial chaos.

The current credit squeeze for developing countries started after the crisis of 1982, which was precipitated by a drastic loss of confidence on the part of foreign lenders who were suddenly struck by the enormous size of third world debt. According to the latest OECD tabulation, the total outstanding external debts of developing countries reached the 1 trillion dollar mark ($1,054 billion) at the end of 1985. This meant a net increase of $108 billion within a single year. According to OECD, however, more than half of this increase ($55 billion to $60 billion) was the result of the appreciation of the Japanese yen and European currencies, which pushed up the value of non-dollar-denominated indebtedness. The meeting of Finance Ministers of five major developed market economies in Paris in February 1987 produced no change in the flow of funds to developing countries. It did, however, hold out the promise of reduced volatility in the foreign exchange markets.

The 1985 third-world debt figure was equivalent to 50 per cent of the combined gross domestic product (GDP) of all developing countries that year. Almost 95 per cent of the debt was owed to OECD member countries, and this in turn was equivalent to 11 per cent of the combined GDP of all OECD countries.

In 1985, however, 19 out of 24 OECD member countries had a combined outstanding external debt of $1,154 billion, exceeding the total third-world debt figure. Again, putting this figure into perspective, the total external debt of OECD countries in 1985 was equivalent to more than 13 per cent of the combined GDP of all OECD countries and 60 per cent of the combined GDP of all developing countries. Given that the bulk of new loans contracted since 1985 were strictly for developed countries, the current external debt figure of the OECD countries should be nearly $1,400 billion.

In 1985, the total external debt accumulated by Brazil reached $107 billion, which was equivalent to slightly less than 50 per cent of its gross national product (GNP) of that year. In the same year, two OECD member countries had outstanding debts exceeding 80 per cent of their respective GDPs (see table 1). In 1985 there were eight OECD member countries whose gross debt-to-GDP ratio was 50 per cent or more, while seven countries in the South had comparable ratios. Yet a more important comparison is provided by the trade surplus figures. In 1985, only two heavily indebted developed countries earned surpluses, while all seven heavily indebted developing countries had a positive trade balance.

The reverse flow of funds, which amounted to $31 billion in 1985, is thought to have increased since then. If the indebted developing countries have indeed been paying back their debts (albeit not promptly nor in the amounts previously specified), and if their debt-

Table 1. External debts of individual countries, 1985

Country	Total debt (billions of dollars)		Debt-GDP ratio	Trade balance in 1985 (billions of dollars)
United States of America	430.1	(312.1)	10.9	−124.4
Brazil	107.3		49.7	+13.1
Canada	107.2	(98.2)	31.2	+12.6
United Kingdom	102.2	(74.6)	22.6	−2.3
Mexico	99.0		60.9	+8.4
Italy	78.2	(41.4)	21.9	−7.0
France	61.7	(8.3)	12.1	−4.5
Argentina	50.8		71.9	+4.9
Australia	50.3	(42.0)	32.3	−1.3
Republic of Korea	47.0		51.5	0
Sweden	44.2	(36.4)	34.2	+2.4
Denmark	42.4	(36.5)	65.7	−0.8
Belgium	40.0	(24.0)	49.8	−0.3
Venezuela	33.6		73.3	+6.8
Indonesia[a]	32.5		42.8	+5.5
Spain	29.3	(13.4)	17.3	−4.0
Norway	28.2	(13.9)	48.7	+4.7
Turkey	26.1	(23.8)	52.8	−3.0
Philippines	24.8		76.1	−0.5
Greece	24.0	(21.8)	73.1	−5.1
Chile	21.0		126.9	+0.8
Finland	20.7	(16.1)	38.0	+0.9
Austria	20.4	(8.7)	30.9	−4.0
Nigeria	19.3		22.9	+4.4
Ireland	17.2	(14.1)	81.6	+0.2[a]
Portugal	16.6	(8.6)	80.2	−1.5
Thailand[a]	15.3		36.8	−1.9
New Zealand	13.4	(11.8)	57.6	−0.2
Peru	13.4		97.9	+1.1
Colombia	11.3		36.8	0
Iceland	1.8	(1.6)	52.4	0

Sources: *World Debt Tables 1985-1986* (Washington, D.C., World Bank, 1986); *The AMEX Bank Review*, vol. 13, No. 9, 28 October 1986; *World Financial Markets*, September 1986; *International Financial Statistics*, vol. XXXIX, No. 11 (November 1986).

Note: Figures in parentheses show net debt position. Net debt figure for developing countries are not available.

[a] 1984 data.

to-assets and debt-to-earnings ratios happened to be either comparable to or better than those of the indebted developed countries, then the current crisis of confidence is definitely misplaced. The explosive growth of corporate debt in the United States in recent years has pushed up the debt-equity ratio close to 60 per cent. The price-earnings ratio on the New York Stock Exchange currently exceeds 17 to 1 and in Tokyo, 51 to 1. The average consumer in the United States has a personal debt in terms of instalment credit approaching 20 per cent of his or her income. Yet, in the face of such a debt burden, the financial world is radiating confidence. By comparison, it seems that the development potential of most of the indebted developing countries should entitle them to better credit access in the long-term credit market.

Discussion of third world indebtedness frequently avoids recognition of the basic nature of the debts. Most of them were incurred by Governments on behalf of their countries. As with any national debt, the timing of its redemption is a crucially important consideration in the management of an economy. The national debts of developed countries can and in fact do remain in perpetuity (in other words, they are continuously refinanced) because the Governments have the ultimate power to tax or print money to repay the debt. To a certain extent, the basic problem with third world debt is not the long-term economic potential of developing countries, which is broadly promising, but the inability of developing countries to conduct trade and enter into debt obligations with their own currencies.

In this regard, one promising development in financial markets is the so-called "debt-equity swap", which involves purchase by foreign investors of the debtor country's foreign currency IOUs at a discount abroad and their redemption in the debtor country's local currency for the purpose of acquiring an equity share of local businesses. The debtor countries do not receive any direct benefit out of these complicated deals, except that the fixed interest payments are replaced by dividend remittances that depend on current and future performance rather than on past miscalculations. Debt-equity swaps create a two-tier exchange rate which might lead to misallocation of resources and even the danger of so-called "round-tripping" by domestic or foreign firms. In recent cases (Brazil, Chile, Mexico and the Philippines), the local currencies obtained through debt redemption constituted only a part of their respective investments.

Currently, the total value of third world debt changing hands in the secondary market is estimated to be between $6 billion and $10 billion a year [3]. In 1986, roughly $3 billion of this went into debt-equity swap deals of five developing countries (Argentina, Brazil, Chile, Mexico and Philippines). Mexican debt was trading at 80 per cent of the face value in October 1985. After six months it was trading at only 67 per

cent, and in February 1987 the discount was 57 per cent. Loans to Peru carried the largest discount—they were trading at 25 per cent of the face value in February 1986 and 18 per cent in February 1987 [4]. This means, in effect, that any foreign investor seriously considering business deals in these countries is being offered a huge reserve of capital at a 20 to 80 per cent discount. The latest initiative by the World Bank to establish debt-equity conversion funds for these countries and the decision by the 12 largest Japanese banks to establish a joint holding company in the Cayman Islands exclusively devoted to buying back the outstanding debt obligations of the Latin American countries will expand this secondary market for third world debt. Although the recent action by banks to increase loan loss reserves may lead to a further rapid growth of the swaps, the swap market still remains small in relation to the $300 billion owed to banks by the 15 largest third world debtor countries. In spite of the inherent limitations, however, it is hoped that the swap market may well trigger a renewed interest in direct foreign investment in debtor countries.

In conclusion, it appears that for the time being the prospects for renewed interest by international bankers in new loan activities in developing countries are still dim. Access to long-term capital markets through bonds or equity issues is also generally limited because of low credit ratings of developing countries. It is hardly likely that public aid flows will pick up in the near future. But new initiatives are slowly emerging to accommodate investment needs in a post-adjustment phase. An agreement towards the establishment of a Multilateral Investment Guarantee Association has been concluded. The increasing acceptance of the debt-equity swap mechanism could be a sign of the gradual adjustment by the international financial community to the real long-term investment opportunities in developing countries. Given the nature of "competitive interdependence" in modern industrial society, one might wonder whether the latest vigorous outward movements of Japanese industries, coupled with the aggressive effort of industrial restructuring in some developing countries, would stimulate a resurgence of direct foreign investment on a broader front in the third world. Let us turn to this question in the next section.

C. The changing structure of international investment and production

In 1985, Japan became the largest creditor country in the world, holding approximately $130 billion in new assets overseas. Its record $82 billion current account surplus in 1986 must have increased this figure. In 1986, Japan became, at least in nominal dollar terms, the highest per capita income country among the 24 industrialized countries of OECD. The sudden appreciation of the Japanese yen is forcing many Japanese firms to seek overseas production bases. It has also raised questions in Japan as to whether the country could effectively recycle its surplus funds and fulfil the entrusted task of financing international development as both the United Kingdom and the United States had done earlier.

In 1840, the United Kingdom produced half of the world's industrial output. By 1880 its share had come down appreciably because of the then rapidly industrializing United States, whose world industrial output share caught up with that of the United Kingdom at 28 per cent. This happened because the United Kingdom, in coping with a huge payment surplus, had actively encouraged investment overseas. Indeed, the annual balance-of-payments surplus of the United Kingdom reached the level of 5.7 per cent of its GNP in 1871, creating enormous inflationary pressures at home. By investing abroad, the United Kingdom gradually relinquished the role of producer-supplier of industrial goods to the world and became more of the owner-manager and stockholder in mines, plantations, railways, canals and industrial enterprises abroad. By 1881, the United Kingdom owned 68 per cent of outstanding foreign investment by all countries. The United States, with its enormous untapped economic potential, remained the major recipient country of this international capital flow.

The roles had completely reversed by the end of the Second World War. The United States spent approximately $11 billion to help reconstruct the war-torn economies of Europe. Unlike the case of the United Kingdom or of modern Japan, the annual balance-of-payments surplus of the United States never exceeded 1 per cent of its GNP (except during the 1945-1950 period when the annual average was 1.4 per cent of its GNP). The United States, however, continued to invest overseas, and by 1960 it owned 76 per cent of total global direct foreign investment outstanding at that time. This figure came to an all-time low in 1983 immediately after the 1982 recession and is still declining. Total United States direct investment outstanding at the end of 1985 was $232.7 billion, which gave the United States a 42.5 per cent share of the world total.

Since 1985, however, the general exodus of United States transnational corporations from foreign operations, especially from developing countries, has become increasingly evident. For instance, total new United States direct investment in developing countries during 1985 amounted to $3,864 million. This amount, however, included a fund transfer of $4,044 million to United States affiliates in such offshore financial centres as Bermuda and Netherlands Antilles.

The retreat of United States transnational corporations from developing countries was to a large extent occasioned by plummeting oil and primary commodity prices. Thus, in 1985, new investments in petroleum-associated activities disappeared and the investment flow became negative (−$1,775 million). United States investments in the mining and agricultural sectors have also become negative, registering $99 million in withdrawals. The manufacturing sector in developing countries managed to attract $956 million in new investment from the United States in 1985. This amount, however, was a third less than the $1,289 million figure in 1984.

The exodus of United States transnational corporations had not become, at least not until 1985, a worldwide phenomenon. The total new direct investment of the United States in European and other OECD countries jumped to $14,719 million in 1985, of which $10,456 million went into manufacturing activities.

There are, however, strong indications that United States transnational corporations are now looking more and more inward, not only because of the weaker dollar, but because of the increasing competition posed by transnational corporations of Japan, the Netherlands and the United Kingdom, which are acquiring and expanding production capacities in the United States. At the end of 1985, foreign companies owned assets in the United States worth approximately $180 billion. Although no official estimates are available yet, the 1986 value of foreign-owned assets in the United States is expected to exceed that of overseas assets held by United States transnational corporations, $233 billion, at the end of 1985.

The role as a principal overseas investor has thus passed from the United Kingdom to the United States and now to Japan. But there the similarity ends. Each country has played this role differently. The United Kingdom was mainly a portfolio investor and carried on little production overseas. The United States carried on production overseas as it exported capital. It is not certain as yet whether Japan will forge its own particular response or follow along either of the two earlier paths.

Japan has been producing less than 3 per cent of its total manufacturing output overseas. This compares with the United States figure of 18 per cent (23 per cent in 1982) and the 19 per cent of the Federal Republic of Germany in 1984. In fact, United States manufacturing subsidiaries overseas produced 2.1 times the value of total United States manufacturing exports in 1982 (balance-of-trade figures do not reflect this). The overseas production-to-export ratio for Japan was only 0.3 in 1982, the year when Japanese overseas production activity reached a peak. Recently, however, Japan's new direct investment overseas ($12.2 billion in the 1985/1986 fiscal year) has been increasing rapidly.

According to the latest survey by the Ministry of Labour of Japan, 26 per cent of Japanese manufacturing firms with 1,000 or more office workers have already shifted part of their manufacturing bases overseas, and altogether 52 per cent of these firms are planning overseas manufacturing in the near future. This is a drastic departure from tradition. In the past, Japan was mainly interested in using developing countries as final assembly points, either to cater to local markets or to re-export to a third country to circumvent quotas placed on Japanese exports. The drastic appreciation of the Japanese yen is, however, forcing many Japanese manufacturers to seek cheaper supply sources abroad for parts and components for their finished products. Unlike that of any other developed country, the Japanese production structure has been vertically integrated through intricate and enduring affiliate and subcontract systems, whereby thousands of parts and component suppliers formed an extended corporate family surrounding each major manufacturing and exporting firm. The recent rush to secure external sourcing of parts and components therefore signals the end of an era.

The use of developing countries and areas as assembly and re-export points by Japanese manufacturing firms is providing an impetus to the massive trade surpluses of the Republic of Korea and Taiwan Province of China with respect to the United States. For example, the export surplus of Taiwan Province with the United States expanded to $7.5 billion during the January-July period in 1985, and the Republic of Korea, with its export boom to the United States, managed to earn $3 billion in overall trade surplus in 1986, the first trade surplus figure with the United States ever achieved by that country. At the same time, the triangular trade relationships involving these two developing economies with Japan, on the one hand, and the United States, on the other, have strengthened Japan's position as the unrivalled supplier of capital equipment, mechanical and electrical components and other intermediate products to these economies.

A similar triangular relationship involving Mexico has been emerging lately. During the 1970s, the Government of Mexico established an export-processing zone along its northern border to encourage United States manufacturing firms to take advantage of cheap local labour to do final assembly jobs and to export finished products back to the United States. Currently, there are 735 United-States-owned processing plants in this zone, which is centered around Tijuana and Ciudad Juarez. Many Japanese firms that have already established sales offices or production plants in the United States are now investing heavily in this zone, to make it a strategic supply depot for the United States market. Already one Japanese plant is assembling 250,000 colour television sets a year and will be followed by three other major Japanese entries in 1987. Two Japanese car manufacturers are establishing plants producing automotive parts, and altogether 20 new investment projects, including the production of transformers, high-fidelity equipment, videotape recorders and refrigerator parts, are expected to start operation in 1987 alone. To a lesser extent, similar triangular relationships of investment and trade have been targeted on the European market. Of total Japanese direct investment in countries of the European Economic Community (EEC) of $1.7 billion in 1985, 8.2 per cent (approximately $140 million) went to Spain, where the entire amount was invested in manufacturing, especially final-assembly activities.

In recent years, Japanese manufacturing concerns have stepped up investments in countries where their markets are located, primarily North America and Western Europe. For example, under the agreement on "voluntary export restraints", the number of Japanese-made cars allowed in the United States was first set at 1.68 million in 1981; this limit was raised to 1.8 million and then to 2.3 million in 1985. In the meantime, however, Japanese car makers have invested in new assembly plants in the United States that can produce 2.2 million units by 1990. Again, under the voluntary export restraints, Japan is allowed to export 2 million colour television sets a year to the United States. In 1985, Japanese plants assembled five million sets in the United States. In Western Europe, Japanese subsidiaries produced 1.6 million videotape recorders in 1985, while selling only 3 million produced in Japan. How long such Japanese investment will be welcomed by the United States and European countries is a moot question. Many Japanese are already concerned about the possible danger of creating "investment frictions" in addition to "trade frictions" with the United States and the European countries.

Such investment frictions will be not less likely in relation to the third world. The traditional attitude of developing countries towards foreign direct investment has been at best ambivalent. Recently it has gone from hostility to hasty approval. The current shortage of long-term development capital is forcing many developing countries to come out with hastily assembled incentive packages to induce foreign direct investments. An overly generous package of incentives, which may not be in the interest of either the foreign investors or the host countries, might have to be rescinded or modified sooner or later. But the current experience in structural adjustment through liberalization in developing countries seems to generate a greater confidence in the logic that direct investments, involving a commitment to share profits and risks alike, can provide easier access to marketing facilities, including the "counter-trade" type of arrangements that bypass the fickle foreign exchange and finance systems of today.

Behind the shifting investment policy climate may be discerned some new features of the "globalization" of industrial production. Deregulation introduced as a measure to revitalize the economy of developed countries has had profound but paradoxical effects. The laissez-faire philosophy that inspired the initial moves towards privatization and liberalization in the United States and the United Kingdom has now been adopted by many developed as well as developing countries, including some centrally planned economies. But this trend has also made western industry more mobile. There is extensive relocation of firms from their original base, and in some cases subcontracting abroad and the replacement of parts by cheaper imports have reduced the domestic content of manufactured products. The United States textile and apparel industries have been losing approximately 100,000 jobs anually, not so much because of imports from foreign countries, but more because of imports by the United States apparel industry from its overseas manufacturing bases. One of the biggest farm tractor manufacturers in the United States, after suffering corporate profit losses, has started importing tractors manufactured in the Federal Republic of Germany, Norway and the Republic of Korea to be distributed under its own brand name. The company earned $198 million in profits in the latest reporting year. One of the three biggest United States motor car producers has a similar plan to market cars made in the Republic of Korea under its company logo in the fall of 1987. Japanese manufacturers have also started sourcing out their parts and components in some developing countries, particularly since the sharp revaluation of the yen. Recent examples include parts for their audio and video products, and machine tools and plant equipment for their turnkey contracts.

With cheap but relatively sophisticated labour, some of the Latin American and most of the East Asian countries became the major beneficiaries of the globalized production network. Indeed, almost 27 per cent of the $170 billion United States deficit in 1986 was with these rapidly industrializing developing countries. Having successfully negotiated a devaluation of the dollar of between 30 and 40 per cent *vis-à-vis* other OECD currencies, the United States is reportedly asking Brazil, the Republic of Korea and Taiwan Province to revalue their currencies upwards in an attempt to stem their import penetration of United States markets. But the case for such a revaluation seems dubious.

Most of the East Asian and Latin American countries have a long history of pegging their national currencies to the United States dollar, which in fact has served as an unofficial reference currency to businessmen in their often inflation-torn economies. This being so, it could be argued that the dollar-pegged currencies of these developing countries could have been previously overvalued against the Japanese yen and European currencies as was the case with the United States dollar. This might not be such a questionable proposition as it seems—most of the developing countries having a trade surplus with the United States invariably have negative trade balances with Japan and Europe. Other evidence more to the point could be found by checking the latest list of products these countries are sending to the United States. They are invariably products that compete directly with Japanese and European imports, many of which the United States ceased to produce domestically long ago.

Although a lack of data prevents full treatment of the subject, the flow of investment among developing countries themselves deserves some comment. During the late 1970s the world saw the emergence of new suppliers of capital, technology and skills among the ranks of the non-OPEC developing countries. For example, in 1980 five developing countries combined, namely Argentina, Brazil, India, Mexico and Republic of Korea, accounted for direct foreign investment of approximately $2.5 billion in other developing countries. More importantly, they earned nearly $1.3 billion through licensing arrangements and the provision of consultancy and technical services [5]. Besides these five countries, the territory of Hong Kong, the Philippines, Singapore and Taiwan Province had invested substantially in the manufacturing activities of their neighbouring countries in South-East Asia, while Bolivia, Chile, Colombia, Ecuador, Paraguay and Peru actively participated in intra-regional cross-country investments [6].

Thus, world industry as a whole has been undergoing drastic transformations. These transformations, some technological and others organizational, were triggered off partly by the "post-industrial" slackening in developed countries and partly by the broadening edges of comparative advantage in developing countries that have built up their own technological and organizational capabilities for industrialization. The mounting protectionist pressures in developed countries can add instability to the process of international restructuring. But a desperate search is under way to find outlets for redeployment of the technological and managerial resources being released from distressed industries in developed countries. This is well illustrated by the rising bilateralist bias in international development co-operation. The conditions therefore seem to exist for a potentially much faster pace of international transfer of both technology and money than was the case a few decades ago.

In the pursuit of long-term development objectives it would be important to reaffirm, in the light of a fair amount of empirical evidence now available from

technology policy studies,* that the process of technology absorption and adaptation has seldom been continuous and smooth, but has tended to be accompanied by periods of painful societal adjustment to changing environmental constraints. Industrial rehabilitation, now a fashionable slogan in discussions of international industrial co-operation, should be viewed rather as a great opportunity for real indigenous innovations, a key condition for optimal deployment of locally accumulated resources and industrial progress. The role of productivity-raising changes in structural adjustment should now receive more serious attention. The present pressures to shift resources from the public to the private sector and to cut back on government spending ought not to result in the neglecting of important sources of long-term development such as improved education, training, communications and transportation, where public policies and programmes are to play a crucial role.

D. Industrial restructuring in developed countries and comparative advantage of developing countries

Since 1982 approximately 12,200 United States companies or their subsidiary firms are said to have been involved in mergers and acquisitions. This sweeping change in ownership and management on the United States industrial scene coincides with drastic attempts by United States industries to reduce production costs and to improve productivity so as to compete against foreign producers at home and abroad. Indeed, over the past five years, United States productivity growth in manufacturing (measured in hourly output) has averaged 3.8 per cent a year, compared with a modest 1.3 per cent average between 1973 and 1981. In the process, unit labour costs actually fell in 1983 and 1984, and they are expected to increase by less than one third the inflation rate in 1987.

These productivity gains were obtained, in the first instance, through modernization. For example, the average age of United States chemicals plants is said to be less than 10 years old, after an extensive modernizing effort and the re-equipping of plants in the last 5 years. Even the United States textile and clothing industry is gradually winning back some of its lost market shares by automating the entire production process—from weaving cloth to cutting and sewing. The exodus of United States apparel makers overseas, especially to South-East Asia, has been abating lately, and in 1986 one firm even repatriated production of thousands of men's shirts from Taiwan Province and Hong Kong.

The most prevalent instances of higher productivity, however, have been the result of cutbacks in excess capacity. The United States textile industry has closed more than 250 mills and reduced its labour force by 17 per cent since 1980. Productivity in the steel industry rose by 20 to 30 per cent in 1983 and 1984, mainly because of the closing-down of inefficient mills, which reduced total capacity by 20 per cent. The earnings of the chemical industry improved by 60 per cent in 1986 after phasing out product lines that were considered uncompetitive.

If United States industries are restructuring by slimming down, Japanese industries have been restructuring through selective expansions, at least as late as 1984. As may be seen from table 2, in Japan only 5 out of 26 industrial branches that have experienced declining demand started decelerating their investment activities in the first half of the 1980s. In the United States, however, the deceleration in investment happened in 18 out of 22 industries experiencing a slowdown in output growth. In Europe, output growth has declined in all manufacturing industries of the Federal Republic of Germany, except the rubber products industry. Nevertheless, in eight industrial branches, including textiles, wearing apparel and petroleum refining, the pace of investment has increased. All other industries, however, have slowed down their investment considerably, and in fact most have been disinvesting since 1981.

Will all these trimming and slimming activities and the modernization efforts by the industries of developed countries change the pattern of comparative advantage in world trade between developed and developing countries? Or will developing countries continue to retain their edge as a consequence of having cheap labour?

With regard to the advantage of having cheap labour, in the United States a typical extractive industry such as iron ore or coal mining spends 32-35 per cent of its total revenue on wage compensation to employees. The wage component in the manufacturing sector is generally lower, amounting to 27-32 per cent in the consumer non-durables industry; 15-19 per cent in the intermediate products industry; and 7-17 per cent in basic industries such as petroleum refining and steel. One exception is consumer durables industries such as those manufacturing household appliances and radios, television sets and other electronic units where wage components usually run as high as 40 per cent of their total production costs. This means that, although United States labour productivity is much higher, the extremely low wage rates prevailing in developing countries can make a net difference in corporate earnings of anywhere between 3 and 20 per cent across the entire spectrum of the manufacturing sector.

Today, manufacturers are using less and less material and energy inputs. As long as material inputs are necessary, however, access to cheaper supplies of them provides a crucial competitive edge in corporate earnings. The cost of iron ore supplied to the new Brazilian steel complex is currently less than one fifth the price of imported ore used by Japanese steel mills. Pumping out crude oil in the Middle East costs less than one dollar, while it costs up to $17 in the United States. Natural gas used as the main feedstock material for the production of many basic petrochemical products is available almost free in many oil-producing developing countries. Electric power supplied to aluminium industries located in Brazil, Ghana and Venezuela costs these countries only a fraction of what it costs developed countries. In addition, many

*For example, the Science and Technology Policy Instrument (STPI) Project (1973-1978), funded by the International Development Research Centre and Inter-American Development Bank, a summary report of which is given in Francisco Sagasti, "Main comparative report of the STPI project" (IDRC-109). See also the various monographs from the ECLA/IDB Research Programme in Science and Technology, Buenos Aires, 1977-1983.

Table 2. Restructuring in developed countries: changes in output and investment between the periods 1970-1980 and 1980-1984

(Based on average annual growth rates)

ISIC	Industry	Federal Republic of Germany		Japan		United Kingdom		United States	
		Output	Investment	Output	Investment	Output	Investment	Output	Investment
3	Total manufacturing	–	–	–	+	+	+	–	–
311	Food products	–	–	–	+	+	+	–	–
313	Beverages	–	–	+	+	..	+	–	–
314	Tobacco products	–	–	–	+	–	+	–	–
321	Textiles	–	+	–	+	+	+	–	+
322	Wearing apparel	–	+	–	+	–	+	–	–
311	Leather and fur products	–	–	–	+	+	+	–	–
324	Footwear	–	–	–	+	–	–	–	+
331	Wood and wood products	–	–	–	–	+	–	+	–
311	Food products	–	–	–	+	+	+	–	–
332	Furniture and fixtures	–	–	–	–	–	+	+	+
341	Paper and paper products	–	–	–	+	–	+	..	–
342	Printing and publishing	–	–	...	...	–	+	+	–
351	Industrial chemicals	–	+	–	+	+	+	–	–
352	Other chemical products	–	+	–	+	–	+	–	+
353	Petroleum refineries	–	+	–	+	+	–	–	+
354	Miscellaneous petroleum and coal products	–	–	–	+	+	+	–	–
355	Rubber products	+	+	–	–	–	+	...	...
356	Plastic products	...	...	–	+	–	+	–	+
361	Pottery, china and earthenware	–	+	...	...	–	+	–	–
362	Glass and glass products	–	+	–	+	–	–	–	–
369	Other non-metal mineral products	–	–	–	+	+	+	–	–
371	Iron and steel	–	+	...	...	+	–	–	–
372	Non-ferrous metals	–	+	–	+	+	–	+	–
381	Metal products	–	–	–	+	+	+	–	–
382	Non-electrical machinery	–	–	–	+	+	+	–	–
383	Electrical machinery	–	–	+	+	+	+	–	–
384	Transport equipment	–	–	–	–	–	+	+	+
385	Professional and scientific equipment	–	–	–	–	–	+	–	–
390	Other manufacturing industries	...	...	...	...	–	+	...	...

Source: United Nations Industrial Statistics, estimates by UNIDO/IS/GLO.

Note: + = increase; – = decrease.

agro-based industries enjoy cost advantages in terms of the enormous differentials in world prices of agricultural products.

All these facts reflecting cost advantages of developing countries, at least in the standard manufacturing activities, are well known. What is new is that developing countries, during the last decade and a half, have attempted to exploit these cost advantages. The overall results are mixed and the speed of progress made by individual developing countries differs enormously.

One measure of industrialization is in the relative share of the contribution made by the manufacturing sector to the economy. For example, the current share in the United States economy is 24 per cent, and in the United Kingdom 20 per cent. Three decades ago, only a handful of developing countries had a manufacturing sector sizeable enough to make any substantial contribution to their economies. Today, however, 50 out of 95 developing countries (statistically verifiable) have a manufacturing-to-GDP ratio exceeding 11 per cent (the current ratio of Norway). Twenty-three developing countries have reached a figure for the share of manufacturing above 20 per cent, and seven of these countries have already exceeded the 24 per cent figure. Even the least developed countries as a whole managed to register a positive annual average growth of their manufacturing value added of 2 per cent during the period 1973-1985. Among this group of countries, 11 had a share of manufacturing in GDP

of over 9 per cent (while 13 still had a share lower than 6 per cent) in 1985.*

The need for industrialization in developing countries is therefore firmly established. Although developing countries as a whole still produce less than 14 per cent of the world's total manufactures, to further their industrialization efforts they have been saving more and investing more than developed countries. Investment statistics in manufacturing are difficult to obtain. The medium-term trend in developing countries is characterized by the fact that most of their industrial branches had a positive growth of investment even during the period 1980-1984, when their outputs suffered a negative growth rate, whereas quite a few industries in developed countries had negative growth in both their output and investments during the same period. UNIDO calculations, which are based on 43 sample countries, give developing countries as a whole an approximate 18 per cent share in world manufacturing productive capacity at the end of 1985. Did developing countries make a mistake in building up their capacities? Have these investments already become obsolete?

Whether developing countries have been investing in the wrong industrial revolution or not (see discussion of this topic in *Global Report 1986*) cannot be decided at this time, because there is as yet no real indication as to how successful the current modernization efforts in developed countries to reduce production costs have been. However, judging from what has so far been reported, it seems that the absolute cost advantages of developing countries are holding up more or less intact, especially in industries where the cost-cutting exercises in developed countries consist largely in a half-hearted industry-wide reorganization.

For example, in June 1986 the Government of Japan announced a reorganization plan for the shipbuilding industry that will reduce its 6 million gross tonne annual capacity by 20 per cent. Although this will reduce the number of loss-making shipbuilders, the unit cost of production is expected to remain uncompetitive internationally, and by more than 60 per cent when compared with the cost in a neighbouring developing country. The closing-down of many inefficient steel mills in the United States has raised the average earnings of the steel industry in that country. However, only the huge appreciation of the Japanese yen has made the unit cost of United States steel production comparable to that of Japan. The cost of producing non-specialized steel in the United States still remains 20 to 30 per cent higher than in the Republic of Korea and Brazil, respectively.

Cost-cutting through modernization and automation has a more immediate consequence for developing countries that rely on cheap labour as their main asset. The United States apparel industry is currently reported to be testing a sophisticated robotic sewing system that makes sleeves for suit jackets four times faster than a human operator. This computer-controlled system, which cost $19 million to develop, will be sold at prices ranging from $100,000 to $250,000 [7]. This means the depreciation allowances and finance charges for the machine will be anywhere between $25,000 and $75,000 a year, a sum far exceeding the cost of hiring four sleeve-makers in South-East Asia. The industry is obviously expecting the price of the machine to come down to around $35,000. However, one trained person to operate the machine will cost a minimum wage of $16,000 in the United States, a sum again exceeding the wages of four sleeve-makers in Hong Kong. Since the machine replaces four clothing industry workers, it could not have been developed to protect employment in the United States apparel industry. If the lowering of unit costs were the main aim, automation in the United States textile industry has to go considerably farther to overcome the absolute advantage in wages possessed by developing countries.*

It appears, therefore, that the industrial capacities so ambitiously and painfully built up by developing countries in the last decade and a half have not been completely wasted, at least not as yet and not by the various cost-cutting exercises in developed countries. There is, however, a real danger that what has not been accomplished through industry-to-industry competition might be ushered in by government fiat, through a regimentation of international trade amounting to outright protectionism. If anything distinguishes the bulk of new investments in developing countries from that in the recent past, it is the fact that they are trade-oriented. There are very few developing countries that can afford a reasonably balanced industrial structure of their own without participating in a larger framework of inter-country trade and specialization. Indeed, even for such a basic industry as steel, Brazil could not have built it and operated it economically without exporting part of its output. Contraction in world trade therefore poses the most immediate danger for the industrialization prospects of developing countries, as well as for many export-oriented industries in developed countries.

The industrialization policy-makers of developing countries have thus reverted to an inward-looking strategy, but one quite different from the straightforward import-substitution strategy of the 1950s and early 1960s. The new inward-looking strategy stresses the need, on the one hand, to improve the policy instruments and mechanisms for promoting small-scale industries and, on the other, to renew efforts to achieve regional and subregional solidarity arrangements among developing countries themselves, especially on basic industries. Potential South-South co-operation also includes joint ventures and technical co-operation between developing countries.

Nevertheless, many countries, especially in the South, continue to hope that economic expansion in the North will strengthen and broaden beyond the United States, a country that has been largely responsible for pulling the world economy out of the 1982

*Currently, there are 40 countries officially designated as "least developed" by the United Nations Economic and Social Council. Twenty-six of these are located in Africa. In nine other countries and areas in Africa (Angola, Gabon, Ghana, Liberia, Mauritania, Mozambique, Namibia, Nigeria and Zaire), the share of manufacturing in GDP is less than 9 per cent, underscoring the urgent need to implement the United Nations resolutions on the Industrial Development Decade for Africa.

*For example, according to a recent study by Misawa of Nihon Kogyo Bank of Japan, the hourly industrial wage rates observed in different countries and areas (adjusted on the basis of the exchange rates of 12 May 1986) were: Japan, $10.42; United States, $9.52; Singapore, $2.03; Taiwan Province, $1.60; Republic of Korea, $1.29; and Mexico, $1.08.

recession and sustaining it almost single-handedly ever since. In the process, the United States balance of trade has deteriorated continuously, reaching a deficit of $164 billion in 1986. The United States Government is projecting a 3 per cent GDP growth in 1987 because of strong domestic demand supported by improved capacity utilization and productivity. However, the United States is making it very clear to the world that its deficit must come down to nearly $120 billion in 1987. This means that there has to be an increase in United States exports of approximately $44 billion or an import cut of the same magnitude or a mixture of both. Regrettably, an official appeal by the United States Government for "adjustment through global growth" has not so far been heeded by the rest of the world.

Adjustment through export expansion rather than forced import cuts has been the long-standing plea of debt-ridden developing countries, and the case for such a positive-sum game for the world economy was presented in *Global Report 1985*. In reality, however, the world economy has been operating with its gear firmly reversed for some time. Since 1982 even international agencies responsible for development have been preaching the virtue of financial discipline to developing countries and have become, in some instances, an instrument for the introduction of austerity programmes in those countries. The result has been striking. In 1981 there were only three non-OPEC developing economies with current account surpluses, namely Panama, Trinidad and Tobago and Uganda, the combined current account surplus of which amounted to approximately $450 million. Since then there have been 24 additional entries (not all at the same time): Barbados, Brazil, Grenada, Mexico, Peru and Venezuela in Latin America; Botswana, Chad, Congo, Côte d'Ivoire, Lesotho, Liberia, Nigeria, Sudan and Zaire in Africa; and Pakistan, Philippines, Republic of Korea, Samoa, Solomon Islands, Sri Lanka, Taiwan Province, Thailand and Vanuatu in Asia. Very few of these economies became "solvent" without curtailing imports drastically. Indeed, their total imports dropped by 23 per cent within a four year period after 1981, while exports stagnated. During the same period, the total import bill of all developing countries dropped from $494 billion to $447 billion, or by 10 per cent.

If the United States reduces imports by $40 billion in 1987, it will have an enormous impact on the world economy at a crucial juncture. The huge balance-of-payments deficit of the United States has to be reduced at some stage for political if not for purely economic reasons. It will, however, not only trigger another contraction in world trade, but might fundamentally change the existing institutional framework for foreign trade. Already in the United States there is discussion of the establishment of a quota system and import licensing scheme. To a certain extent, State-controlled imports are inevitable when, under the present system of international payments, the burden of adjustment always falls exclusively on the deficit country and the external debt incurred during the process increasingly becomes a threat to national sovereignty. The situation is somewhat ironic, however, in that many developing countries are now in the process of liberalizing their trade regimes.

E. The plight of primary product producers and the increasing software content in manufacturing

Steadily, and sometimes imperceptibly, manufactured products are becoming not only more efficient and better, but also smaller, lighter and cheaper. The automobiles of today are not only fuel-efficient, but come in smaller sizes with lower price tags in real terms. The introduction of pocket calculators and portable radios, personal computers and desk-top copying machines, mini-vans and mini-forklifts, all have extended the range of uses these products could be put to because they are smaller and lighter. If these products have brought convenience and economies to consumers and producers, they have also brought about enormous savings in the use of raw materials to their manufacturers and to the world economy as well.

Smaller and lighter products are one visible aspect of the current technological revolution that has made it possible to save natural resources and energy. Laying a new transoceanic communications cable with fibre-optic material would replace much heavier and more expensive installations of the old copper-wire type. One or two communications satellites consisting of 2,000 kilograms of metallic and non-metallic material each could replace the need for such transoceanic cables altogether. Computer-aided design (CAD) and automated production processes reduce material waste. Numerically controlled machines eliminate the need to install several machines to tackle a similar job with different specifications. There is a host of new materials such as carbon fibres, boron, sapphires and various polymers and ceramics, a tiny amount of any of which could effectively replace tonnes of steel and other metallic products.

Today, the average family in the United States is estimated to possess 10 radios, including two in the family cars and several pocket-sized types. It would not be surprising if the combined weight of these 10 radios happened to be less than one cabinet-styled stereo set of 10 years ago, or even one wireless set with vacuum tubes. In the production of Japanese cars, the amount of steel used to produce one unit has declined from 1,001 kilograms in 1975 to 841 kilograms in 1983 and to below 800 kilograms in 1985. Statistics relate the story eloquently. Between the years 1979 and 1984, the world population increased from 4,397 million to 4,781 million. Despite this 8.7 per cent growth, the world as a whole consumed less steel (721 million tonnes in 1979 versus 685 million tonnes in 1984), less tin (255 million tonnes to 216 million tonnes), less copper (9.3 million tonnes to 9.28 million tonnes), and less crude oil (3,139 million tonnes to 2,711 million tonnes). On a per capita consumption basis, the list of industries that underwent contractions in demand would cover most of the natural-resource-based industries, including aluminium, wood pulp and bulk chemicals.

In September 1986 the Dow Jones primary commodity price index plunged to a record low of 112.4 after an almost continuous price slide from the peak of 218.59 in January 1980. This prolonged depression in primary commodity prices in the 1980s stems from three factors. The first reason is that demand for primary commodities has become stagnant. Not only

is economic growth world-wide slowing down, but the trend towards lighter and smaller products has resulted in a drastic lowering of the raw material content of most modern manufactured products. The second factor is the sudden expansion in supply capacity. The extraordinary commodity price boom during the 1970s encouraged many developing countries to expand their production capacities. For example, the total copper-refining capacity in market economies increased from 8.6 million tonnes in 1975 to 9.8 million tonnes in 1985. Three developing countries, namely Chile, Peru and the Philippines, accounted for more than half of this expansion.

The third and perhaps the most paradoxical factor is that developing countries that borrowed to finance their expansion have no choice but to go into the production stream in order to service accumulated external debts. Brazil, Chile, the Republic of Korea and Venezuela are all trying hard to sell the products from their newly expanded steel mills. Both Brazil and Venezuela expanded their aluminium smelting capacities in the 1970s and are currently producing three to seven times their 1975 output, while the price of primary aluminium is being driven down. Indonesia and Thailand became major producers of unwrought tin in 1981 when the world tin price had already started to come down. Countries that have invested heavily in crude oil and petroleum derivatives are experiencing the same difficulties. For example, the price of methanol, the basic raw material for high-quality plastic products for industrial use, dropped by 39 per cent in 1986, when both Indonesia and Malaysia commenced production.

Will the prices of primary products recover? If so, how soon? These are not easy questions to answer. There are, however, some indications that the slide may have come to an end. A number of desperate efforts have been made by the producers of primary products to stabilize prices through production controls. Although the results are still meagre, the agreement by OPEC member countries to hold the crude oil price at $18 a barrel, the Kuala Lumpur announcement by seven major tin-producing countries to bring down the world supply of tin to about 7 million tonnes a year, the agreement between Zaire and Zambia not to expand their respective market shares, so as to hold the cobalt price at $7 a pound, and the Canadian-inspired discussions among aluminium-producing countries, all will contribute to bring some price stabilization to the world market.

The second and more direct reason for expecting some price stabilization in the near future is that the prolonged price depression has finally convinced many producers of primary products in developed countries to cut back or phase out their operations. In the United States, oil exploration has practically stopped and many unprofitable oil wells are being closed. The steel industry in the United States and in most European countries has curtailed production drastically and more or less permanently. During the last seven years Japan, once again the first country to see the inevitable, has phased out the production capacities of copper smelting from 116,000 to 20,000 tonnes, aluminium from 1,040,000 to 130,000 tonnes, and tin from 254,000 to 220,000 tonnes. This world-wide process of contraction is expected to continue until it becomes all-pervasive, leaving only the cheapest producers to survive.

Total domestic production of crude steel, regarded as an important factor in the development of a fully fledged capital goods sector, increased in developing countries at an annual rate of 10.3 per cent from 1975 to 1985, whereas in developed countries it decreased in absolute terms (by 9 per cent over the same period). The share of developing countries thus doubled from 9.2 per cent in 1975 to 18.2 per cent in 1985. On the demand side, developing countries, which accounted for 15.6 per cent of total world steel demand, now account for a little over 25 per cent. This world-wide restructuring of industry has been characterized by the increasing dominance of mini-mills in steel-making technology. The modern mini-mills already look very much different from the earlier basic furnace-caster mills, with the adoption of innovations such as water-cooled panels and roofs, scrap pre-heating, ladle refining, turndish shrouding and in-line rolling. It was the new technology for combining electric furnace melting and continuous casting of billets that made the traditional concept of scale economies in steel-making increasingly obsolete. The continued success of mini-mills in future would depend on the possibilities for further incorporating new technologies in ladle metallurgy, horizontal casting, hot charging, direct rolling etc. As in other industries, the use of computer controls has already become popular with steel-makers in both developed and developing countries. Further developments are foreseen in the application of process computers that would make possible savings of energy, electrodes and refractory materials.

Primary commodity producers in developing countries are doubly challenged by the emerging technologies. The growing use of new substitute materials threatens their immediate income-earning capacity, while those who wish to expand their industrialization plans to include domestic processing of hitherto exported primary commodities will have to keep abreast of the continuing innovations in process technologies. The real threat to the future North-South relationship lies not so much in the disparities in current income and consumption levels as in a widening technology gap that could not be closed by even a massive transfer of resources, technological or financial. A determined policy aimed at long-term technological self-reliance in each developing country, coupled with enhanced programmes of technical assistance from the international community, would be essential.

Another equally important and still somewhat neglected aspect of the challenge to traditional manufacturing is that what the material inputs industry is saving often happens to be its own output. The manufacturing sector as a whole has begun to lose its relative economic position to non-material productive sectors such as services.* Thus, the current technological revolution is making manufacturers in developed countries more and more service-conscious—a trend that has some unsettling implications for future

*Although developed countries have been losing manufacturing employment to the services sector for some time, the relative economic importance of the manufacturing sector measured in terms of output started to decline after 1973. See "Is there deindustrialization in the North?", in *Global Report 1986* (UNIDO publication, Sales No. E.86.II.B.5), p. 99.

Oil price fluctuations: ominous clouds or ... horizon

After a decade of record high oil prices, initially quadrupled by the Middle East crisis in 1973, and further doubled by the Iranian Revolution in 1979, oil prices fell for the first time in nominal terms to $29 from $34 per barrel in March 1983, and since then continued their rapid slide to $9.64 per barrel in July 1986 before rising to the current level of $18 per barrel (Saudi Arabian light crude spot price). The fall in oil prices marked the beginning of a period of uncertainty and instability in the oil-exporting countries as well as in the world economy.

Oil price movements during the period 1973-1986, in both current and constant (1974) United States dollars, are plotted in the accompanying figure. In 1975-1978 and in 1986, the constant dollar oil price (deflated by the United States GNP deflator, 1974=100) remained lower than the 1974 level of $11.5 per barrel. In July 1986, the constant price was about half the 1974 level. By contrast, the real price more than doubled to $22 per barrel between 1978 and 1979, and jumped another 30 per cent in 1980.

There is a strong likelihood that nominal oil prices will remain between $15 and $20 a barrel through the end of the 1980s, and begin to rise on average by 1 to 2 per cent a year in real terms over the period 1990-1995, although the actual upward movement may take the form of a sudden sharp increase, as occurred in 1973 and 1979, followed by a flat but higher nominal price level being maintained up to 1995.

The following points tend to support this assessment of the possible trajectory of oil prices:

(a) The current recession in developed countries, with over 33 million unemployed in the OECD area, could trigger off social and political upheavals. The only means of averting the crisis is by reflating the economies of developed countries. When the world economy picks up, so will energy demand;

(b) Much of the energy conservation achieved so far has been the result of an exceptional combination of circumstances, and no further significant improvement is likely to occur;

(c) The recession has reduced the development of non-OPEC sources. Although the OPEC share of world crude oil production dwindled from over one half of the 1973 total to less than one third by the end of 1985, OPEC could reassert itself in the crude oil markets by using production controls if the world economy surges upward and oil demand grows. Many of the existing non-OPEC and some OPEC sources are operating at peak levels, with the prospect of exhausting their reserves in the near future. For instance, North Sea production will reach its maximum output of 2.5 million barrels per day (mbd) before 1990; the Union of Soviet Socialist Republics is believed to have already peaked at 12.5 mbd; no additional output is expected to flow from the fields of Alaska; Mexico has reduced its exports to 1.5 mbd; and major discoveries are yet to be made from oil exploration activities in China and the United States continental shelf.*

The longer-term trends seem easier to discern, with critical shortfalls looming on the horizon beyond 1995. All the adjustment has so far been on the demand side, and none of the oil exploration or development over the last decade has fundamentally changed the prospect of a world with progressively shrinking reserves. Moreover, no significant progress in the development of alternative energy sources to replace oil has been under way. Worse still, the current weakening in oil markets may have seriously hurt the belated and already faltering efforts to develop an alternative to oil. Given the lead time of 10 to 20 years needed for the development of alternative energy sources, it would not be far-fetched to expect in the second half of the 1990s a succession of oil shocks similar to those of the 1970s, forcing oil prices up to well beyond $40 a barrel.

A closely related problem is that of a threshold price of oil below which irreparable damage is likely to be done to the future expansion of energy supplies. This natural floor for the oil price is commonly fixed in terms of the cost of producing oil in high-cost areas such as the North Sea and Alaska. Such a critical lower boundary is estimated to be within the range of $10-$15 a barrel at current prices. Even within this price range, most higher-cost oil production would have to be shut down, and any plans for developing offshore oil and long-distance gas transportation, not to mention far more costly new and renewable sources of energy, would have to be shelved. For instance, at $15 a barrel only 13 of the 39 fields on stream or under development in the North Sea would have a positive net present value.* Meanwhile, world-wide hydrocarbon exploration activities are estimated to have dropped by 25 to 30 per cent between 1982 and 1984, and by around 50 per cent in 1984-1985. The North Sea is estimated to have lost about 80 per cent of its exploration activities during this period.**

Whatever the oil price level, be it $20, $15 or $10 a barrel, it should be kept stable, or changed only gradually, in an orderly and predictable manner, over a longer stretch of time than just a few years. Otherwise, the long-term damage caused by wild swings between cheap energy and new price hikes would more than outweigh the temporary benefits to be gained from short-lived low prices. The violent fluctuations in oil prices could have a destabilizing and devastating impact on the world economy. They destabilize all commodity and service prices, including currencies linked directly or indirectly to oil. They destroy business confidence and undermine the forecasting of future trends in prices, exchange rates, production, inventory, imports, exports, investment and many other strategic variables. They would thus thwart an orderly transition to a non-oil energy system and raise the spectre of acute energy shortages accompanied by widespread social and political tensions.

The core of the problem appears to lie in the inherent instability of oil prices. The capricious fluctuations of commodity prices are well known. The oil price is even more capricious than most commodity prices, being extremely sensitive to a host of political, socio-economic and psychological factors. This instability may be partly attributed to the existence of a widely divergent cost structure among oil producers. Instability is inevitable in any market in which commodity prices exceed the pro-

*See "World oil situation", *The World Economic Outlook* (Washington, D.C., International Monetary Fund, 1985).

*See *Petroleum Economist*, May 1986.

**See *Energy Policy*, August 1986.

duction costs of major producers severalfold.

A cursory review of recent oil price movements clearly reveals the fragility and volatility of oil prices. An excess supply of approximately 3 mbd in the world market, about 5 per cent of total world oil production, triggered the recent collapse in oil prices. Oil market hypersensitivity to a temporary supply disruption of less than 9 per cent of the total also resulted in the 1979-1980 oil crisis, with the oil price soaring from $12 a barrel to $38 a barrel in a few months.*

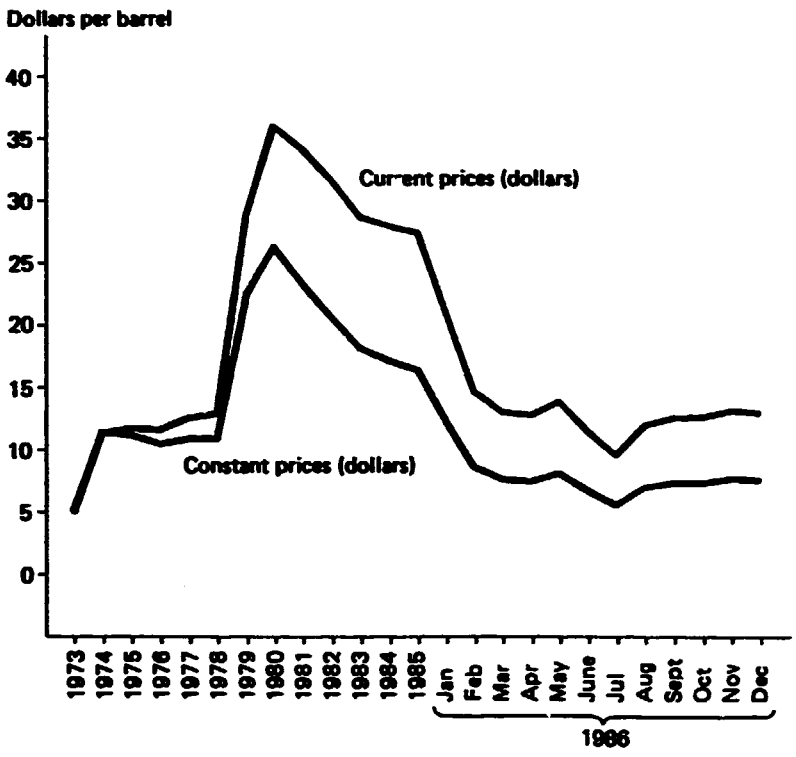
In a sense, the interest of the major oil producers could be better served by the market price mechanism. For the oil price will probably continue to fall until the surplus oil disappears and an equilibrium price balancing supply and demand is established. However, such an equilibrium price may be so low as to drive marginal producers out of the market, pushing the output of OPEC swing producers back up to maximum capacity and cutting non-OPEC output substantially. Low-cost producers could then reassert their dominance over the oil market.

Two fundamental questions remain. The first relates to the right price of oil and the viewpoint from which it should be considered. The right price for consumers is bound to differ greatly from that for producers. Even within the OPEC group, the issue is far from clear. The right price may refer to the price that enables OPEC to secure a fair share of the market, whatever a fair share may mean in practical terms, or to the price that generates equitable export incomes for member countries consistent with the reserve capacity of crude oil and the financial requirements of their socio-economic development. However, conflicting interests and widely divergent views of development needs and oil revenue requirements between "low absorbers" and "high absorbers" may prove to be extremely difficult to reconcile.

The second unresolved question relates to price stability. Given the inherent fragility of the oil market as mentioned above, the market forces of supply and demand cannot be counted on to achieve sustainable oil prices. It seems clear that violent price fluctuations generated by capricious market forces, intensified by new speculative practices such as those of the oil futures and forward markets*, must be contained by non-market measures, such as an agreement on oil production limits or a co-operative dialogue between consumers and producers on pricing and demand and supply management. Whatever practical measure may be contemplated, they must still relate to the underlying market forces of supply and demand. Elementary economic theory provides a clear pointer. Any price-fixing that deviates far from the equilibrium level will soon collapse, creating excess demand or supply. It is therefore imperative that more effort and resources be devoted to improving the techniques used in the analysis of rapidly shifting oil market conditions and the underlying factors affecting supply and demand, and in the forecasting of future oil price movements to permit the identification of the best target range for pricing.

There is an inherent contradiction, at least in the short run, between the commitment to stake out a "fair share of the market" and the commitment to defend prices, that is, price stability. Once again, economic fundamentals suggest that even in the case of a pure monopoly with a single producer in the market, either price or quantity can be controlled, but not both. It must be decided which objective to pursue, a market share or price stability. New approaches, more innovative schemes and imaginative ideas must be generated to foster a co-operative endeavour between OPEC and non-OPEC producers, and between producers and consumers, stressing the strong mutuality of interest between these groups. The need for a constructive dialogue between producers and consumers cannot be over-emphasized.

Oil price movements, 1973-1986



Source: Petroleum Economist; World Oil Trade; Organization of Arab Exporting Countries, *Annual Statistical Report,* various issues.

*See J. Amuzegar, "The oil price turmoil", *Finance and Development*, June 1986, pp. 14-15.

*See *The Economist*, 23 May 1987, p. 85. The article describes how oil market futures and options are increasingly analysed and programme-traded and hence become extremely sensitive to psychological factors rather than to the fundamentals of supply and demand.

exports of manufactured products from developing countries.

Partly to protect their declining shares in value added, manufacturers in developed countries are increasingly adding services or software contents to their product. It has already become a tradition in the United States that most durable consumer goods are sold with a one-year service component included in the product price. Motor car manufacturers are competing with one another not only in the terms of loans provided to customers, but also in their leasing and renting business. Manufacturing can be done anywhere in the world, but customer servicing has to be done locally. One reason frequently cited for the apparent failure of United States and European manufacturers to secure reasonable market shares for their products in Japan is that they do not pay enough attention to their customers' needs before and after their products are sold in that country. This has become an important part of the dispute about entry barriers.

It was almost impossible in the past for a developing country to market its products in developed countries without the help of local distributors. Until very recently, no developing country dared to attempt to break into the markets of developed countries with its own brand of products. Most of the manufactured products of developing countries have entered the markets of developed countries on a consignment basis. A manufacturer or wholesaler in a developed country with a well-established national market subcontracts factories in developing countries to produce goods according to its own design and specifications. With more and more manufacturers turning into multi-product and multi-business concerns in developed countries, the process of farming out part of their production processes to developing countries will continue to increase, especially since profit margins can often be greater in designing, developing, distributing and marketing new products than in manufacturing them. This new international division of labour involving manufacturers in developed countries and factory owners in developing countries shows signs of flourishing with an increasing deregulation of industries in developed market economies and the consequent price competition both at home and abroad.

Besides the imminent danger of being singled out for official trade sanctions, export-oriented and finished-product-oriented developing countries are faced with the challenge of a qualitative change taking place in the consumer markets of developed countries. Affluent consumers in developed countries are becoming more and more individualistic and increasing their purchases of speciality goods. Consumer tastes appear to be changing more quickly and frequently. Yet the real concern of producers in developing countries is not just market segmentation, but the likely changes in the structure and relative behaviour of the segmented markets in the future. Consumer market analysis today commonly uses differentiated estimation models for speciality brands and standardized low-price categories of each product group. The latter categories, now being increasingly catered for by imports from developing countries, tend to have lower income elasticities and higher price elasticities than the former. Developing countries have so far been, and will be for some time, confined to exporting mass-produced and lower-priced products. However, this may not necessarily be damaging to these countries since most of them, being small, have not yet had the opportunity to exploit the economies of scale offered by mass production.

As is well known, technology has both "hardware" and "software" aspects. Also, science and technology policy analysts often speak of "systems" of technology as distinguished from individual "elements" of technology. More complex technology involves a greater number of hardware and software elements and a larger "system software" that enables effective combinations to be applied. Hardware elements are physically tradable. Software elements, too, are likely to become increasingly transferable from one culture to another (or learned through *ad hoc* training), with the help of micro-electronics. But system software is something that has to evolve through actual productive experience in each socio-economic environment, since it represents the collective know-how and societal mechanisms for ensuring a proper interface between physical science disciplines and given particular socio-organizational structures. It includes not only technical and financial management capabilities at the enterprise level, but the entire gamut of institutional mechanisms for providing the necessary infrastructures and policy support for industrialization. Thus, the process of industrialization requires the mastery of increasingly complex system software. Historically, the phase of mass production may be viewed as a condition that has facilitated the latter process. It constitutes, therefore, an important part of the conditions necessary for developing countries to build up robust endogenous technological capabilities for industrial development. And, for that matter, the recent phenomenon of more service-conscious product differentiation in developed countries may be viewed as an indication of the emergence of ever more complex system software that goes with increasingly sophisticated hardware elements and systems.

II. Industrial performance and the outlook in different regions

In this chapter a detailed review of the industrial sector and the outlook for the near future are presented for four developed and six developing regions, and within each region certain countries are considered individually for purposes of illustration. The specific circumstances of these countries should be borne in mind in assessing their overall performance. While such problems as the fall in prices of primary products or the rise in real rates of interest are common to all, it is the differences between countries in the various developing regions that give insight into the process of industrial adjustment and development.

While much happened in 1986 that was a continuation of slow growth, falling prices and rising indebtedness, there are also clear signs that many developing economies have learned the importance of coping with adversity by adapting and by using local skills and resources instead of depending on a guaranteed flow of imports. This positive outlook should be set in the balance against the many negative aspects of the economic situation in recent years.

An attempt will be made to answer the following three specific questions throughout this chapter: what are the main features of recent trends in the composition and size of industrial output; what industrial reforms and policy changes have individual Governments adopted to cope with the external and internal disequilibrium; and what effects are those policy changes likely to have on industrial growth in the immediate future (1987 and 1988).

A. North America

Healthy economic growth in the United States and Canada, the combined markets of which take more than half the manufactured exports of the South, is of great importance to developing countries. The GDP of North America is expected to grow in 1987 and 1988 by 2.7 per cent and 3.1 per cent respectively (compared with 2.8 per cent in 1986). The reasons for this guarded optimism are several. The region's industrial sector, after an extensive restructuring in 1986, should be more efficient and profitable. The level of inventories, after dramatic declines, should begin to recover with increased factory orders for manufactured goods, although consumer demand appears somewhat hesitant and government spending uncertain. The weaker dollar and less stringent licensing rules for technology exports are expected to help the international competitiveness of the region's manufactures. In fact, from the third quarter of 1986 onward, United States exports have begun to rise, with the fourth quarter recording a 9.4 per cent growth of exports in volume terms over the corresponding period of 1985. United States exports to Japan jumped by 12.6 per cent in 1986. If this is the start of a new trend, the revitalized manufacturing sector is likely to be the driving force in the economy of the region. UNIDO projections show that the regional manufacturing value added (MVA) is likely to grow by 2.8 per cent in 1987 and 3.3 per cent in 1988, representing an improvement far above the 1.1 per cent growth achieved in 1986.*

Despite many favourable factors in the recent past, such as sharply falling oil prices, the devaluation of the dollar against the yen and other competing currencies, a reflationary fiscal stance and an accommodating monetary policy, manufacturing growth has been weak and uneven. In 1985, the durables and non-durables industries grew at roughly the same rate (2.3 and 2.5 per cent respectively). In 1986, non-durables surged ahead to 4.8 per cent, leaving the durables industries far behind, growing at only 0.1 per cent. All the signs point to growth in industries geared to domestic consumption rather than to exports or investment (see table 3). Growth in the non-durables industries is unlikely to sustain continued growth; capital formation and durable goods must be relied on for that. The evidence for 1986 indicated retrenchment and restructuring in iron and steel (−10.4 per cent), non-electrical machinery (−2.4 per cent), non-ferrous metals (−3.7 per cent) and motor vehicles (−1.3 per cent). The only bright spot in the durables industries was furniture (6.2 per cent), obviously boosted by the growth of domestic consumption. It is noteworthy that iron and steel has also been declining for a long time compared with other industries. Figure IV shows relative longer-term changes in the industrial structure of North America.

The hard-hit industries have struggled to restructure and increase efficiency through mergers and acquisitions. During 1985 and the first nine months of 1986, mergers and acquisitions worth $12.9 billion and $3.8 billion, respectively, were transacted in the transport equipment industry, worth $5.9 billion and $12.0 billion in the electrical and electronic machinery

*In the North American region the United States dominates, producing 91 per cent of GDP and 92 per cent of MVA, while Canada produces 9 per cent of GDP and 8 per cent of MVA. Other economies of the region are those of Bermuda, Puerto Rico and the Virgin Islands, producing a negligible sum of manufactured goods compared with the United States and Canada.

Table 3. Growth rates of manufacturing output by industry,[a] United States, 1985 and 1986

(Percentages)

Industry	Growth rate 1985	Growth rate 1985/1986[b]
Manufacturing total	2.4	2.0
Non-durables	2.3	4.8
Food	2.3	2.8
Tobacco	−0.2	−1.2
Textiles	−1.0	8.2
Apparel	−1.8	2.2
Paper	0.3	7.5
Printing	5.1	6.9
Chemicals	4.5	5.5
Petroleum	−0.7	3.7
Rubber and plastics	2.4	4.1
Leather	−11.7	−15.3
Durables	2.5	0.1
Lumber	3.9	6.2
Furniture	4.2	2.2
Clay, glass, stone	1.9	2.0
Primary metal	−2.2	−7.4
Iron and steel	−4.3	−10.4
Non-ferrous metal	0.4	−3.7
Fabricated metal	4.6	−0.7
Non-electrical machines	2.5	−2.4
Electrical machines	−1.3	1.0
Transport equipment	8.2	3.1
Motor vehicles	6.8	−1.3
Instruments	1.8	−1.2

[a]Based on index of industrial output (1977 = 100) published by the United States Department of Commerce.

[b]From July 1985 to July 1986.

industries, and worth a combined total of $8.6 billion in the non-electrical machinery industry for the first nine months of 1986 alone (see table 4 for other industries). An estimate shows that 4,000 of the largest United States companies spent nearly $200 billion on their financial restructuring in 1986, or four times the amount spent in 1984 [8]. Merger and acquisition activities are expected to subside substantially in 1987 because of new United States tax legislation (effective 1 January 1987) eliminating favourable depreciation allowances and investment tax credit.

Since the beginning of 1983, 12,000 companies and corporate divisions (total worth at over $490 billion) are reported to have changed hands. This has had an effect of raising the market value of total assets, with the Dow-Jones average reaching the historic pinnacle of over 2,000 in January 1987. What worries analysts, however, is the fact that on average the debt-asset ratio of enterprises that acquired new assets has gone up at the same time, reflecting loan-financed mergers and acquisitions.

Though mergers and acquisitions tend to "improve" the profitability of sellers and buyers on paper, the crucial question remains whether the financial reshuffling will translate into greater competitiveness through product and process innovations supported by investment in new technology and equipment. By and large, companies are trying to focus on a few products that outperform others by using their existing management skills and resources. These companies and the whole economy could become more efficient as a result.

For capital formation 1986 was not a good year. The evidence suggests that in 1986 industrial enterprises intended to reduce the rate of planned expenditure on new plant and equipment. According to a quarterly survey conducted by the Bureau of Economic Analysis of the United States Department of Commerce, the manufacturing sector as a whole planned to reduce plant and equipment expenditure by −6.2 per cent in 1986 (surveyed in July-August 1986), down from −0.1 per cent (surveyed in October-November 1985). Table 5 provides detailed survey results by industry.

The greatest reduction in planned investment is observable in petroleum (−27.5 per cent), followed by non-electrical machinery (−16.9 per cent), motor vehicles (−12.4 per cent), and steelworks (−10.5 per cent). These industries have suffered fierce international competition and experienced a high volume of merger and acquisition activity. Being challenged by international competition, they are forced to restructure financially, but their effort to re-equip themselves with new products and technology appears relatively weak, mainly reflecting their existing overcapacity.

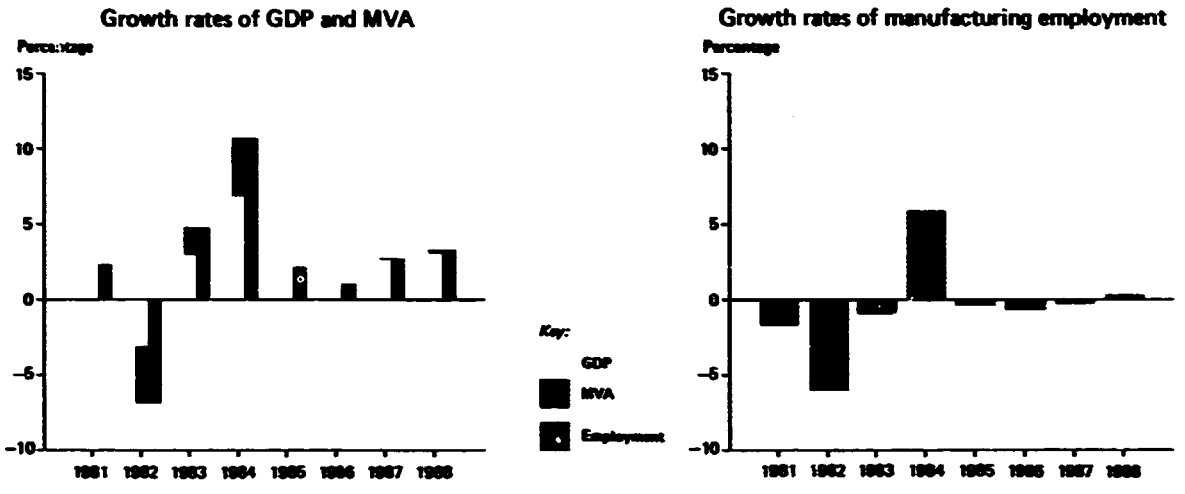
Table 4. Industries with the most merger and acquisition activity in the United States, 1985 and 1986

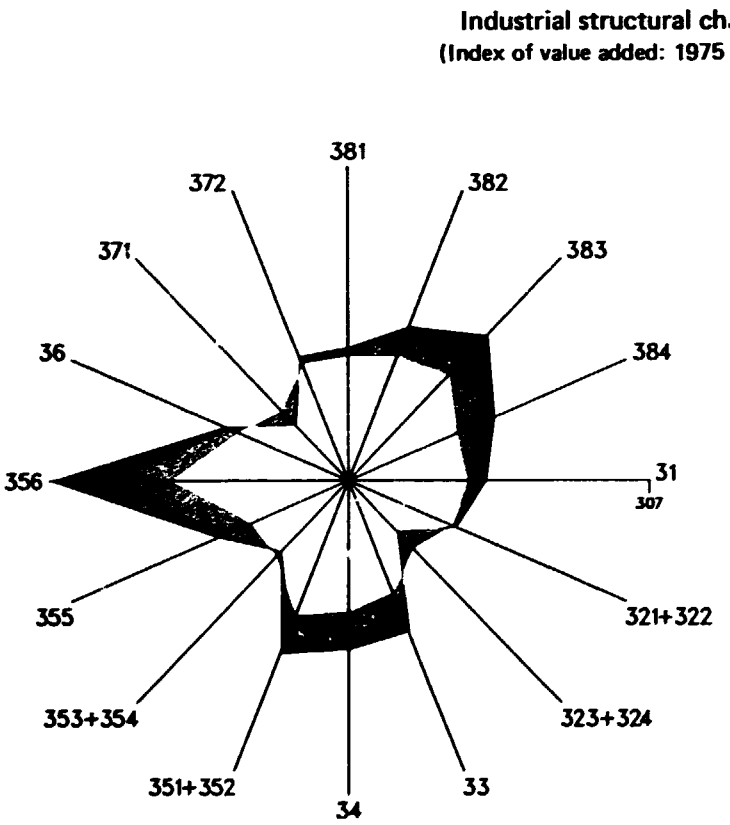
Industry	Volume in 1985 (billions of dollars)	Industry	Volume in 1986[a] (billions of dollars)
Mining, oil and gas	15.3	Communications	13.4
Food	14.6	Electrical and electronic machinery	12.0
Transportation equipment	12.9	Food	11.9
Chemicals	12.3	Retailing	9.2
Banking	7.1	Non-electrical machinery	8.6
Communications	7.1	Utilities	5.7
Retailing	6.3	Chemicals	5.3
Utilities	6.2	Banking	5.1
Electrical and electronic machinery	5.9	Transportation equipment	3.8
Photo, medical and optical instruments	5.4	Mining, oil and gas	3.7

Source: Mergers and Acquisitions Magazine, quoted in *Business Week*, 12 January 1987, p. 32.

[a]Through 30 September.

Figure IV. Growth rates of GDP, MVA and manufacturing employment, 1981-1988, and industrial structural change, 1975-1988: North America





Key:

ISIC code	(industries):
31	(Food products)
321, 322	(Textiles)
323, 324	(Leather industries)
33	(Wood and furniture)
34	(Paper and printing)
351, 352	(Chemicals)
353, 354	(Petroleum and coal)
355	(Rubber products)
356	(Plastic products)
36	(Non-metal mineral products)
371	(Iron and steel)
372	(Non-ferrous metals)
381	(Metal products)
382	(Non-electrical machinery)
383	(Electrical machinery)
384	(Transport equipment)

Constant prices of 1980

g = Average annual growth rate, 1970–1988 (percentage)

θ = Index of structural change, 1970–1988

1985–1988 forecast
1980–1985
1975–1980

Sources: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

Table 5. New plant and equipment expenditures by United States business, 1984, 1985 and 1986

(Percentage change from preceding year)

Industry	Actual		Planned in 1986			
	1984	1985	October-November 1985 survey	January-March 1986 survey	April-May 1986 survey	July-August 1986 survey
All industries[a]	16.3	9.2	2.4	2.3	0.2	−1.9
Manufacturing	19.5	10.6	−0.1	−0.9	−2.6	−6.2
Durable goods	24.8	10.6	−2.5	−2.9	−1.4	−6.9
Primary metals[b]	18.4	8.5	−3.3	−0.1	0.1	−3.4
Blast furnaces, steelworks	8.9	16.5	−6.8	−2.1	−2.2	−10.5
Non-ferrous metals	22.6	−11.8	−1.4	−1.9	−0.6	2.6
Fabricated metals	22.5	3.9	−0.5	7.5	13.2	11.7
Electrical machinery	27.9	5.9	−10.2	−10.7	−4.7	−6.3
Machinery, except electrical	14.1	3.7	−3.7	−3.9	−7.9	−16.9
Transportation equipment[b]	42.8	20.3	2.4	0.5	1.1	−8.5
Motor vehicles	53.7	30.6	3.7	1.8	−0.3	−12.4
Aircraft	22.7	−3.3	3.0	2.8	13.9	11.9
Stone, clay and glass	11.6	10.1	0.7	−4.6	−5.0	−6.8
Other durables	22.2	19.7	2.3	−0.9	5.5	5.0
Nondurable goods	15.0	10.5	2.1	1.1	−3.6	−5.5
Food including beverage	13.3	17.1	−0.2	4.6	1.7	−0.2
Textiles	23.7	−7.6	−11.8	0.9	−4.3	−7.0
Paper	21.8	19.2	3.6	3.8	6.7	3.2
Chemicals	18.3	7.3	−0.7	5.6	4.3	5.1
Petroleum	10.3	4.6	3.4	−8.1	−24.4	−27.5
Rubber	26.2	24.3	6.3	3.1	4.4	3.4
Other non-durables	14.8	17.1	4.5	9.3	16.4	14.4
Non manufacturing[a]	14.3	8.4	4.1	4.3	2.1	0.8
Mining	11.0	−5.8	−6.2	−12.5	−22.2	−28.9
Transportation	18.3	9.1	5.1	5.8	1.1	1.8
Railroad	39.1	4.3	2.3	−2.2	−8.8	−6.9
Air	−18.3	34.5	19.3	28.5	20.1	22.6
Other transportation	30.6	−0.4	−2.0	−2.6	−2.5	−4.4
Public utilities	5.6	2.8	−4.4	−0.5	−4.8	−5.3
Electric	−0.6	−2.5	−7.0	−1.8	−6.8	−6.9
Gas and other	35.6	21.6	3.0	3.4	1.0	−0.6
Commercial and other	17.7	12.0	7.7	7.4	7.0	−5.8

Source: United States Department of Commerce [9].

[a]Surveyed quarterly.

[b]Includes industries not shown separately.

In addition to the supply-side picture of industrial adjustments as outlined above, the demand side contains certain elements of uncertainty, relating in particular to government spending and consumer expenditure. It is uncertain whether the Gramm-Rudmann Act will be effectively applied to reduce the federal budget deficit of over $220 billion in 1986. If the original target of $144 billion for 1987 were to be maintained, the deflationary impact could turn out to be costly in the short run. On the assumption that the economy will grow at a 3.2 per cent rate, the $1 trillion budget proposed for the fiscal year 1987 projects a deficit of $173 billion, still a sharp reduction from the 1986 level. Canada is also adopting a restrictive fiscal policy to curb budget deficits (6 per cent of GDP in 1986, compared with 3 per cent in the United States).

In 1986 consumer spending was at its peak. During the first nine months of 1986, personal consumption expenditure grew at an exceptionally high rate of 5.6 per cent, while disposable income grew at 2.3 per cent (all valued at nominal figures). The gap has been filled by consumer debt. With such a debt burden, it is difficult to imagine that consumers will continue to spend so much in 1987. In September 1986 household saving declined to 1.9 per cent of disposable income (a record low), and outstanding debt rose to 19.2 per cent of household income (a record high). According to the latest reports, household consumption declined by 0.5 per cent during the fourth quarter of 1986, the first drop since the 1981-1982 recession. But consumer spending may be rising again by the second half of 1987, when the effects of the new tax legislation begin to be felt on consumer income.

The one hopeful spot has been the expected effect of the devaluation of the dollar against major currencies since September 1985. The dollar value was pushed down by 50 per cent against the yen and 40 per cent against the deutsche mark. The cheaper dollar helped to revive somewhat the export competitiveness of United States computers, processed food, paper products and aluminium. Exports of these products are expected to continue increasing. Exports of computers by Hewlett-Packard to the European market increased by over 150 per cent in 1986, while International Business Machines (IBM) sold 20 per cent more abroad than in 1985. Processed food exports are expected to increase by over 7 per cent in 1987. In contrast, the devalued dollar helped the iron and steel, textiles, motor car, semiconductor, general machinery

and electrical machinery industries only to slow down the rapid erosion of their domestic market share. Despite this large devaluation, or because of it, as implied by the J curve effect, the United States deficit of $170 billion in 1986 was larger than the $146 billion deficit in 1985. Over the same period, Japan increased its trade surplus by 23 per cent to $82.7 billion in 1986, $51.1 billion of which was with the United States.*

Has the dollar fallen far enough? Until recently, conventional wisdom was that only a small correction in United States relative prices (as little as 0.25 per cent per year was suggested) would be necessary to restore the balance of manufacturing balance of trade.** Currently, the view is that the dollar needs to go down much further to improve United States competitiveness.

The devaluation already accomplished may have the effect of forcing Japan and the Federal Republic of Germany to counteract the deflationary pressure through expansionary fiscal and monetary policies. As a result, United States trade deficits could be reduced and the external stimulus could help the United States economy to revive.

To sum up, the North American region as a whole appears to be looking forward to receiving expansionary stimulus from abroad. It is therefore unlikely to provide a strong, buoyant market for merchandise exports of developing countries, with the possible exception of certain developing economies in Asia that could compete with a limited number of Japanese manufactures in the North American market. Moreover, the outlook for foreign direct investment is not encouraging. Some United States transnational corporations have reportedly begun to cut back production in developing countries and return to the United States, because the devaluation of the dollar has made cheap labour abroad less profitable. But the magnitude of such divestment is not fully known.

B. Japan

Following an unprecedented appreciation of the yen, growth in Japan slowed down in 1986 (2.5 per cent in real terms), but is expected to improve to 3 per cent in 1987 and 3.3 per cent in 1988, with extensive industrial adjustments. To some extent, the problems of Japan are the mirror image of those of the United States. Given the accumulating trade surplus and the appreciation of the yen against the dollar, Japanese industries have had to adjust to restore competitiveness in the short term. In the medium term, however, Japan is being urged to reduce its export orientation and give a larger role to domestic demand. Thus the policies needed for the short term are not the same as those for the medium term. The former are largely the responsibility of the individual companies with a minor role for Government. The latter require an integrated mixture of macro-economic and structural policies.

The growth record and prospects of Japan will be briefly reviewed. According to UNIDO estimates, Japan's industrial growth went into reverse in 1986, when it recorded an MVA growth of −0.1 per cent, its first negative growth rate since 1975. The negative growth has been a consequence of exchange rate changes that have wreaked havoc on many export-oriented industries. However, with concerted efforts to restructure industries and robust domestic demand resulting from declining prices, MVA growth is expected to bounce back to 4.3 per cent in 1987 and 4.8 per cent in 1988. A breakdown by industry shows that high-technology industries will be leading the others. For instance, electrical machinery is expected to grow by 8.8 per cent and 9 per cent in 1987 and 1988, respectively, and professional and scientific equipment by 9.1 percent and 9.3 per cent. This follows the longer term pattern of change in industrial structure as reflected in figure V.

In contrast, industries facing severe international competition are lagging behind. In 1986 the following industries experienced negative growth: non-electrical machinery (−8.6 per cent), iron and steel (−6.5 per cent), transport equipment (−4.5 per cent) and textiles (−4.1 per cent). These industries also appear to be planning more severe investment cutbacks than others (see table 6).

In the case of steel, the "big five" mills (Nippon Steel, Nippon Kokan, Sumitomo Metal, Kawasaki

Table 6. Planned investment for plant and equipment in Japan, 1986 and 1987

(Percentage change over previous year)

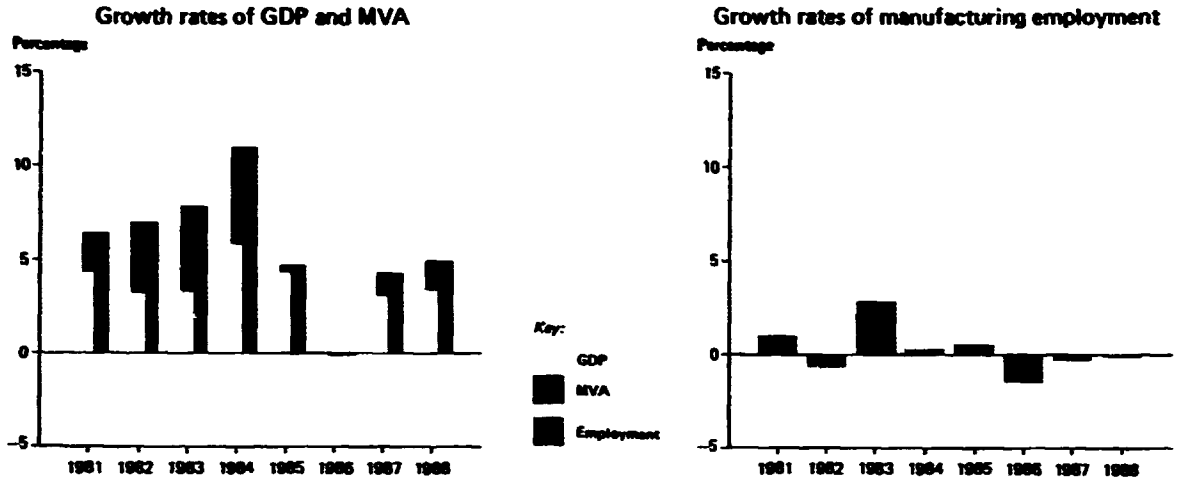
Industry	*1986*	*1987*
All industries	5.5	0.9
Manufacturing	−6.9	−8.0
Food processing	12.0	27.6
Textiles	−15.1	−4.8
Paper and pulp	−7.0	−12.6
Chemicals	7.1	−9.6
Petroleum refining	−3.5	−18.7
Pottery and stoneware	−9.2	−21.0
Iron and steel	1.1	−24.2
Non-ferrous metal	−14.8	−5.1
Metal fabrication	22.4	−29.1
Non-electrical machinery	−29.4	−6.2
Electrical machinery	−21.0	−3.0
Automobiles	−0.5	−3.3
Shipbuilding	−3.7	−16.4
Other manufactures	−2.5	12.7
Non-manufacturing	13.5	5.7
Agriculture, fisheries and mining	7.0	−4.7
Construction	17.4	9.3
Wholesale and retail	14.2	12.4
Real estate	8.1	0.2
Transportation	7.2	2.0
Inland	9.9	3.0
Marine	−15.0	−39.6
Electricity	16.5	0.2
Gas	11.5	11.0
Equipment rental	13.5	12.7
Other non-manufacturing	−10.9	−11.7

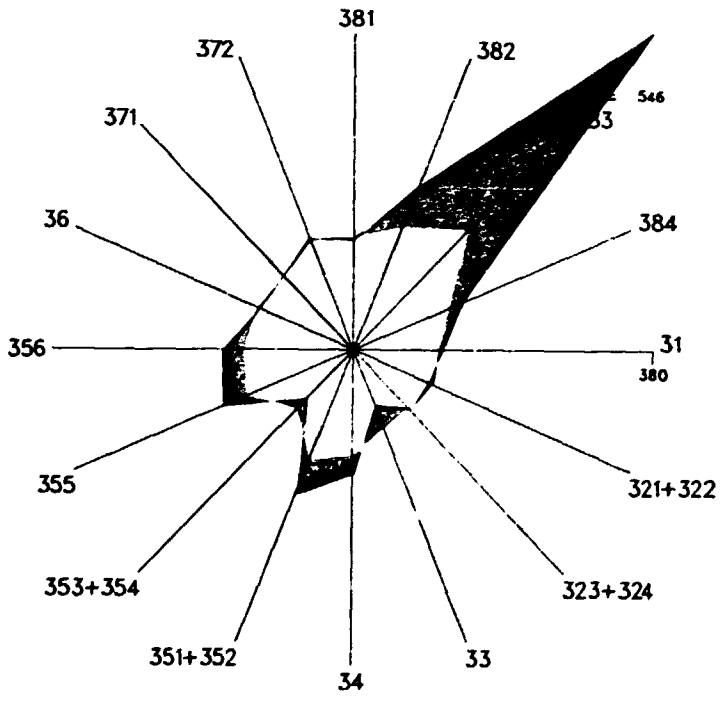
Source: Survey conducted by Japan Longterm Credit Bank in February 1987, based on 1,169 enterprises sampled.

*For an analysis of the various issues, see [10], [11] and [12].

**For instance, it has been stated that ". . . an improvement of less than 0.25 per cent per year in relative United States prices would suffice to ensure balanced trade in manufactured products". See Robert Lawrence [13], p. 48. The previous statement has been endorsed in the following terms: "This result is suggestive. It signals a slight secular deterioration in the United States manufacturing sector's competitiveness, which can be offset by relatively small exchange rate movements." See R. D. Norton [14], p. 16.

Figure V. Growth rates of GDP, MVA and manufacturing employment, 1981-1988, and industrial structural change, 1975-1988: Japan





g = 4.44
θ = 33.19

Key:

ISIC code	(industries):
31	(Food products)
321, 322	(Textiles)
323, 324	(Leather industries)
33	(Wood and furniture)
34	(Paper and printing)
351, 352	(Chemicals)
353, 354	(Petroleum and coal)
355	(Rubber products)
356	(Plastic products)
36	(Non-metal mineral products)
371	(Iron and steel)
372	(Non-ferrous metals)
381	(Metal products)
382	(Non-electrical machinery)
383	(Electrical machinery)
384	(Transport equipment)

Constant prices of 1980

g = Average annual growth rate, 1970–1988 (percentage)

θ = Index of structural change, 1970–1988

1985–1988 forecast
1980–1985
1975–1980

Sources: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

Steel and Kobe Steel) have launched a programme to reduce by 1990 their combined capacity (150 million tonnes a year) to 90 million tonnes, to lower the workforce by at least 25 per cent, and to diversify into coal-based chemicals, computer software, silicon wafer manufacture and special metals (including titanium) using their in-house know-how generated in recent years. The big five had already drawn up a medium-term retrenchment plan even before the yen exchange rate shock in September 1985, but these plans are now being revised further to accelerate the speed of adjustment.

The shipbuilding industry provides another example of drastic adjustment. A government committee has recommended that the industry should reduce its building capacity by 20 per cent by the end of 1987 in order to survive the high yen rate, the world slump in demand for new ships and fierce competition from developing countries with competitive capability in the industry. Ishikawa-Harima Heavy Industries Co., a leading shipbuilder, planned to shed 7,000 full-time workers by December 1986 out of 17,000 employed, and to cut its capacity by 60 per cent over the next two years. Likewise, Hitachi Zosen planned to sell three plants and reduce 3,000 of its 10,500 workers, as soon as feasible, with the co-operation of the labour union.

The motor car industry, which produced a greater number of cars (12.3 million) in 1986 than any other country, has experienced an estimated 27 per cent drop in the value of sales to 1.4 trillion yen (or $8.9 billion) in the year ending March 1987. The profit squeeze arising from the sales drop and adverse changes in the yen-dollar exchange rate prompted car makers to search for adjustment strategies. The options considered included production relocation overseas (to the Republic of Korea, the United Kingdom, the United States and Taiwan Province), purchase of parts from cheaper overseas sources, stepping up sales efforts in the domestic market, cutbacks in new hiring of graduates (−18 per cent in the case of Toyota), electronic innovations to upgrade the quality of existing models and other cost-cutting measures, such as reducing the number of option packages on cars.

The electronics industry, also hard hit by high yen-dollar exchange rates and sagging export sales, is resorting to overseas production as a major adjustment strategy. The Electronics Industry Association of Japan estimates that total output of the industry declined by 0.2 per cent to 17.9 trillion yen ($112 billion) in 1986 compared with an annual average growth of 14 per cent in the four years up to 1985. Besides a high yen, the collapse of sales to China, competition from developing economies in Asia (Hong Kong, Republic of Korea, Singapore and Taiwan Province) and trade disputes with the United States contributed to the declining output. To cope with rapidly changing market forces, electronics companies are moving abroad. Currently about 10 per cent of total production by almost 100 firms is with overseas subsidiary plants and is increasing. During 1986 for instance, Matsushita unveiled six overseas projects; TDK decided to build or acquire factories in the United States and the Federal Republic of Germany; Toshiba announced plans to produce half of their colour television sets in Singapore and to increase production of television chassis in Mexico to feed its North American plants.

A recent Japanese study revealed that factory wages in Japan are now on average 12 per cent higher than those of the United States at recent exchange rates (155 yen to the dollar). Japanese companies are being compelled to move factories to countries where labour costs are cheaper, including the United States, the protectionism of which spurs further Japanese direct investment. Japanese investment in North America jumped by 55 per cent in 1985 alone to approximately $6 billion, raising the United States share of Japanese total foreign direct investment from 35 per cent in 1984 to 45 per cent in 1985. An even higher share is presumed in the United States for 1986.

Developing countries in East and South-East Asia have also received a big chunk of Japanese foreign direct investment, mostly in manufacturing. By March 1986, 11,530 Japanese projects had been initiated in the Asian region, 51.4 per cent of which were accounted for by manufacturing. Five countries of the Association of South-East Asian Nations (ASEAN) accounted for 5,772 projects, or half of the Asian total, the other half going mostly to Hong Kong, the Republic of Korea and Taiwan Province. These economies provide supply sources of intermediate manufactures to Japanese industry or finished products to be exported to world markets. This process of industrial redeployment to Asia is expected to pick up speed even further in the next couple of years, so long as high yen exchange rates persist and Asian wage rates in industry remain well below those in Japan and the United States.

Japan's overall strategy for adjustment today is therefore to seek investment opportunities abroad. But the new strategy represents a shift from the past behaviour of building a complete input-output industrial linkage within Japan,* coupled with the policy of saving on the raw materials content of output by maximizing value-added per unit of imported raw materials before exporting. Thus during the 1960s the composition of Japanese industrial production shifted away from labour-intensive products (such as textiles and toys) to capital-intensive products (such as steel, motor cars, industrial plants, calculators and colour television sets) in the 1970s, and to high-technology-intensive products (electronics, computers and videotape recorders) in the 1980s. Consequently, Japan has come to possess an industrial structure capable of producing virtually a complete set of manufactured goods. At the same time, its import composition has remained stable, with the lion's share consisting of primary goods (raw materials), as well as basic chemicals and some special machines. Thus, compared

*Japan's industrial input-output system is characterized by a closely knit quasi-hierarchical structure, known commonly as the *Keiretsu* system. A business conglomerate has a large number of small- and medium-scale input suppliers under a long-term contract. Close relationships and constant feedback between them help to accommodate quick changes in product specifications to achieve raw materials savings at a minimum of information-and-transaction costs. United States and EEC suppliers have had difficulty in breaking into this hierarchical structure by lowering the price of their wares alone, since price is only one of the many aspects of competition, which includes those arising from organizational efficiency. For a discussion of Japan's parent firm and subcontractor relationships, see Masahiko Aoki [15], pp. 973-976; see also Banri Asanuma [16], pp. 32-53.

with other developed countries, Japan has been able to keep a low level of manufactured imports as a proportion of GDP (see table 7).

Table 7. Ratio of imports of manufactures to nominal GDP of selected developed countries

(Percentages)

Country	*1962*	*1973*	*1982*	*1985*
France	4.8	9.5	12.3	12.9
Germany, Federal Republic of	6.0	9.1	13.0	14.9
Japan	2.8	2.8	2.8	2.7
United Kingdom	4.7	12.0	13.4	17.8
United States	1.3	3.4	4.7	6.1

Sources: *Comparative International Statistics* (Tokyo, Bank of Japan, 1985); and the International Monetary Fund.

The above account provides a background against which the chronic export surplus of Japan in the past should be seen. The falling price of raw materials in international markets (along with price inelasticity of demand for them) was apparently an important factor (among others) in explaining Japan's import behaviour. However, the situation is changing under the pressure of the high yen. In 1986, Japan's exports declined by 1.3 per cent in volume terms, while its imports rose 12.5 per cent, led by imports of manufactured goods, which surged by 22.4 per cent. Such a drastic change in trade reflects in part a shift from domestic to overseas sources of intermediate input supply. This implies a partial dismantling of the *Keiretsu* system.

As far as the medium-term goal of converting to a less export-oriented economy is concerned, the major role is played by the Government. Steps have been taken to reflate the economy and incentive packages introduced to adapt industry away from exports. A 3.6 trillion yen supplementary budget package (1.2 per cent of GNP) was unveiled by the Ministry of Finance in October 1986 to provide a stimulus to the economy. The package included 1.4 trillion yen worth of extra public works and 400 billion yen for investment in plant and equipment for the electricity, gas and telecommunications industries.

Together with the spending plan, monetary policy has been eased somewhat. The discount rate of the Central Bank was lowered further to 2.5 per cent towards the end of 1986, the lowest rate on record. As a longer-term measure, a drastic tax reform is planned. The Government's Tax Advisory Council has advocated an across-the-board drop of the top marginal personal income tax to 50 per cent from the current 70 per cent, a new 20 per cent levy on previously tax-free interest on savings accounts, a more comprehensive capital gains tax on securities transactions and a broad-based indirect tax, akin to a value-added tax. The aim of the reform is to induce the Japanese to earn more and spend more (rather than save), so that the domestic economy can be stimulated while budget deficits contract.

The main measures in the structural policy package include a series of new acts designed to assist small and medium-size industrial enterprises, hurt by the high yen exchange rate, in converting to new lines of production (high-technology and quasi-service activities), to encourage construction of housing and leisure facilities, and to assist laid-off workers in retraining during the period of unemployment and help them to find new employment.

Under the temporary measures, effective for the next five years, eligible enterprises are entitled to low-interest (3.95 per cent) loans with an eight-year grace period for modernization of equipment (worth up to 100 billion yen), exemption from land-site tax, an acceleration of depreciation allowances, the privilege of credit insurance with no requirement of collateral and access to extension services on technology and management. The aim is to encourage the conversion of these enterprises to the production of high-quality products for domestic markets.

The Ministry of Construction recently announced a new policy to encourage private housing investment, hoping to create a locomotive force to support GDP growth. The incentive measures comprise a reduction of new housing tax and rental income tax, loans at low interest rates for second home ownership etc. The measures are expected to increase housing investment by 5 per cent (contributing an additional 3.3 billion yen to GNP).

The Ministry of Labour is to assist in the retraining and relocation of workers laid off from industrial enterprises hurt by high yen exchange rates. The labour adjustment fund will subsidize the unemployed during the period of skill training and relocation, as well as employers who co-operate with the training programmes.

In view of the complex and contradictory pressures that Japan is being subjected to, the question will remain as to whether the short-term success in industrial restructuring will keep the Japanese economy in continuing surplus, or whether conversion to meet the needs of the domestic market will become dominant. The former will have a more stimulating effect on the world economy than the latter, since foreign suppliers find it hard to break into Japanese markets. Japan, which has long played a key role in the rapid growth of world trade, may give conflicting signals in the near future. These differences in industrial growth appear broadly consistent with the longer-term pattern of structural change in industry as shown in figure V.

C. Western Europe

The economies of Western Europe, the largest market area for merchandise exports of developing countries, grew by 2.3 per cent in 1986 and is expected to perform only slightly better in 1987 and 1988 (2.6 per cent for both years). These figures are well short of the average growth needed (3.5 per cent) to meet the EEC target of an 8 per cent reduction in unemployment by the end of this decade, nor are they sufficient to help reflate the world economy. The projected growth of MVA is 2.2 per cent and 2.3 per cent in 1987 and 1988 respectively, reversing the leading role that the manufacturing sector has played since 1984 for the region as a whole. However, the

manufacturing sectors in Italy and, to a somewhat lesser extent, the Federal Republic of Germany are expected to lead other countries in the region with a growth of 4.0-4.2 per cent and 3.6-2.7 per cent respectively in 1987 (see table 8).

Table 8. Growth rates of GDP and MVA: selected countries in Western Europe, 1983-1988

(Percentages)

Country or area	1983	1984	1985	1986	1987	1988
Western Europe						
GDP	1.3	2.1	2.4	2.3	2.6	2.6
MVA	1.1	2.4	3.0	2.0	2.2	2.3
Germany, Federal Republic of						
GDP	1.2	2.6	2.6	2.5	2.8	2.4
MVA	1.0	3.1	4.5	3.4	3.6	2.7
France						
GDP	0.7	1.3	1.4	2.3	2.8	2.9
MVA	1.2	1.6	0.6	2.0	2.6	2.8
Italy						
GDP	−0.4	2.6	1.8	3.1	3.4	3.5
MVA	−2.4	−4.1	1.4	2.5	4.0	4.2
United Kingdom						
GDP	3.3	1.8	3.7	2.1	0.9	1.1
MVA	2.4	4.9	4.0	0.9	−2.2	−1.8

Source: Estimates and forecasts by UNIDO/SR/GLO.

Table 9. Growth rates of GDP and industrial output: EEC countries,[a] 1983-1986

(Percentages)

Item	1983	1984	1985	1986
Gross domestic product	1.1	2.1	2.4	2.5
Consumption	1.1	0.8	2.3	3.7
Investment	0.2	1.3	2.4	4.2
Imports	1.9	5.7	5.2	6.3
Exports	6.2	7.6	5.4	2.1
Industrial output	0.7	2.7	3.3	2.0
Intermediate goods	1.5	3.1	2.2	1.1
Investment goods	−1.4	3.0	5.8	2.6
Consumption goods	1.7	2.1	1.8	3.5
Metals	−1.3	6.1	1.6	−3.7
Chemicals	5.9	5.9	3.6	0.8
Engineering[b]	0.3	2.1	5.3	2.4
Electrical engineering	2.3	6.6	6.8	5.1
Transport equipment	2.1	−3.5	2.6	3.7
Iron and steel	−0.5	6.9	2.9	−7.0[c]
Textiles	−2.5	3.5	2.4	0.2
Food, drink and tobacco	1.6	1.0	2.5	0.9
Clothing	−2.9	2.7	0.4	5.2
Footwear	−3.7	−2.4	−3.7	−5.3
Paper products	2.6	5.3	1.1	1.8

Source: Based on *Eurostatistics*, November 1986 and March 1987.

[a]Belgium, Denmark, France, Germany, Federal Republic of, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and United Kingdom.

[b]Fabricated metal products including non-electrical machines.

[c]Third quarter of 1986 over similar quarter of 1985.

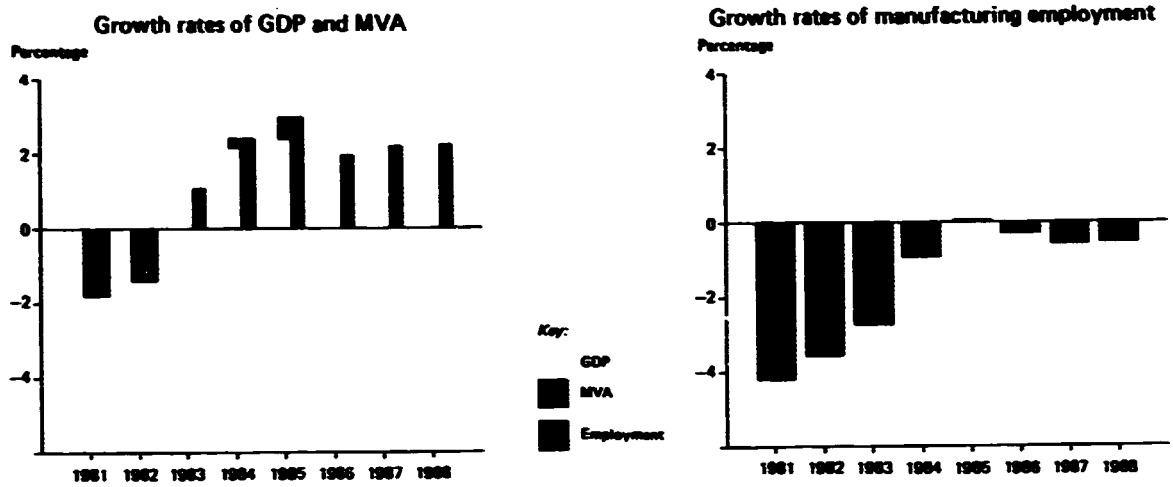
A breakdown by industry shows that in 1986 the growth leaders included clothing (5.2 per cent), electrical engineering (5.1 per cent) and transport equipment (3.7 per cent) (see table 9). These results are encouraging, since the electrical engineering industry largely includes the high-technology branches in which Western Europe has been lagging behind Japan and the United States—a serious concern for policy-makers in the region. It seems that perhaps the catching-up process in the high-technology arena may be gathering momentum (this point will be further discussed later).

The negative-growth industries include footwear (−5.3 per cent), iron and steel (−7 per cent) and metals (−3.7 per cent). They are industries in which developed countries have lost comparative advantage to a growing number of developing countries. Unless protective measures are taken to cope with conditions of slower growth in Western Europe, a steady decline may be expected in these industries. These industry differences in growth appear broadly consistent with the longer-term pattern of structural change in industry as shown in figure VI.

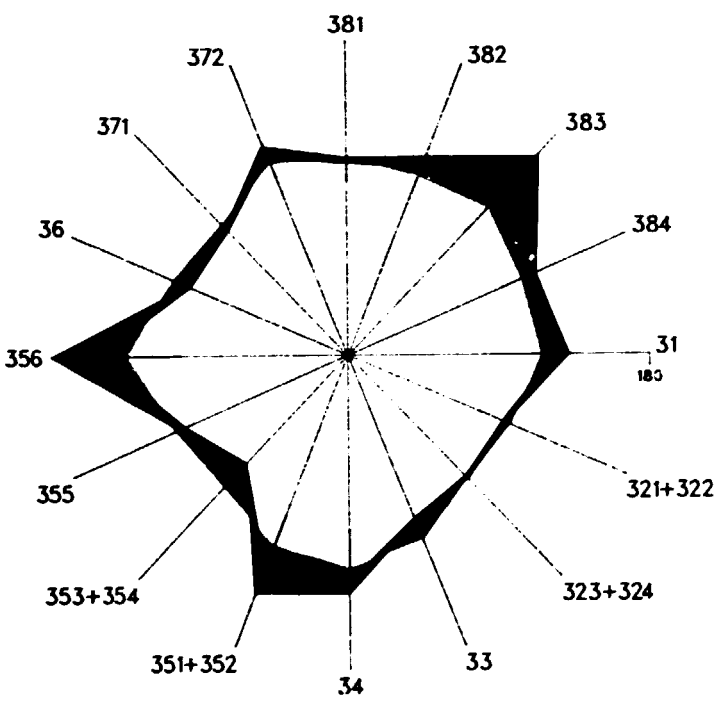
Despite the favourable conditions for industrial restructuring in the region, policy makers appear reluctant to adopt a package of effective reflationary measures. According to the OECD, the impulse derived from fiscal measures might be either nil or negative in 1987 and 1988. As the pull of external demand weakens owing to the cheaper dollar, reflation in the region would depend on internal investment and consumer demand. Fortunately, both factors have been picking up strength, though modestly, since 1984, when external demand peaked. Investment demand grew by 4.2 per cent in 1986, up from 1.3 per cent in 1984, and consumer demand by 3.7 per cent in 1986, up from 0.8 per cent in 1984. These recent trends are expected to continue in 1987 and 1988, supported partly by declining interest rates. However, deteriorating trade, if too rapid, could jeopardize the moderate growth prospects. According to an EEC report, the contribution by export demand to GDP growth has been declining, by −0.2 per cent and −0.9 per cent in 1985 and 1986, and there may be a further drop of −0.6 per cent in 1987. Given the moderate overall prospects for demand growth, the capability of domestic suppliers to compete with industrial suppliers abroad becomes a crucial element determining the pace of growth in the region.

A variety of reasons have been put forward to explain the slow growth of the region. One suggested reason is the region's apparent inability to keep up with internal demand for high-technology products, which has been growing faster than demand for other product groups (see table 10). Products in strong demand include industries such as electrical equipment, electronics, information technology, automated office equipment, precision instruments, chemicals and pharmaceuticals. Demand for products of this group grew on average by 5.2 per cent during the period 1972-1982. This compares with moderate-demand industries, such as rubber, plastics and transport equipment, with a growth rate of 1.9 per cent, and weak-demand industries, such as textiles and metal goods, with a growth of 0.2 per cent during the same period. However, EEC industries have been losing their share of the regional market. Between 1973 and 1982, in the sales of products of high-demand growth industries, the share of imports as a

Figure VI. Growth rates of GDP, MVA and manufacturing employment, 1981-1988, and industrial structural change, 1975-1988: Western Europe



Industrial structural change
(Index of value added: 1975 = 100)



g =	1.73
θ =	7.92

Key:

ISIC code	(industries):
31	(Food products)
321, 322	(Textiles)
323, 324	(Leather industries)
33	(Wood and furniture)
34	(Paper and printing)
351, 352	(Chemicals)
353, 354	(Petroleum and coal)
355	(Rubber products)
356	(Plastic products)
36	(Non-metal mineral products)
371	(Iron and steel)
372	(Non-ferrous metals)
381	(Metal products)
382	(Non-electrical machinery)
383	(Electrical machinery)
384	(Transport equipment)

Constant prices of 1980

g = Average annual growth rate, 1970–1988 (percentage)

θ = Index of structural change, 1970–1988

1985–1988 forecast
1980–1985
1975–1980

Sources: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

Table 10. Growth of domestic demand in volume terms by industries in selected EEC countries, the United States and Japan, 1972-1982

(Percentages)

Industry	*EEC*[a]	*United States*	*Japan*	*EEC,*[a] *United States and Japan*
Strong-demand industries	*5.2*	*4.8*	*13.5*	*6.7*
Electrical equipment and electronics information technology, automated office equipment and precision instruments	8.9	5.7	6.8	7.0
Chemicals and pharmaceuticals	5.5	3.7	11.8	6.4
Moderate-demand industries	*1.0*	*2.3*	*4.8*	*2.5*
Rubber and plastics	3.2	5.0	1.2	3.5
Transport equipment	3.2	1.4	7.1	2.9
Paper pulp, packaging and printing	1.8	2.9	3.7	2.6
Food, drink and tobacco	2.0	1.7	3.8	2.2
Industrial machinery	0.2	3.2	3.6	2.0
Weak-demand industries	*0.2*	*0.5*	*3.0*	*1.1*
Miscellaneous products	1.3	1.8	1.4	1.5
Textiles, leather and clothing	0.2	1.5	2.7	1.2
Steel and metal ores	0.7	−0.7	3.7	1.3
Metal goods	−0.5	0.0	4.2	1.2
Construction materials, non-metallic minerals	0.9	0.3	1.8	1.0
Total manufactured products	1.9	2.3	6.4	3.1

Sources: *Eurostatistics* and Commission departments.

Note: Based on United States dollars and at 1975 prices and exchange rates. The average annual growth rate is calculated on the basis of data smoothed over two years: average for 1981-1982 compared with average for 1972-1973.

[a]Belgium, Denmark, France, Germany, Federal Republic of, Italy, Netherlands and United Kingdom.

percentage of domestic demand rose from 9.3 per cent to 17 per cent.*

The policy makers of the region have broadly agreed to adapt the common policy framework to the needs of industrial revitalization. Their strategy includes less government intervention and more market competition (for example, business deregulation, less taxes and subsidies, elimination of trade barriers among themselves and privatization of State enterprises) and encouragement of technological progress and industrial restructuring (for example, research and development through the establishment of joint programmes, permission of cross-State mergers and acquisitions, encouragement of joint ventures with United States and Japanese firms, and retraining of the unemployed). However, the scope and relative priority of these activities are determined by the enterprises and Governments concerned. Flexibility is needed to accommodate the diversity of interests among the different countries.

A general trend towards less government intervention and a greater reliance on market competition would appear to be slowly taking root. In France, where for decades subsidies have been used to assist industrialists, there has been a policy change. In the budget for 1987 subsidies for industry are reduced by 11 billion French francs, while State agencies such as the *Fonds industriel de modernisation*, founded in 1983, are to be abolished. The Ministry of Industry has already slashed funds available for the electronics sector by 22.6 per cent (by 41 per cent if space industries are excluded). Ailing industries such as steel, shipbuilding and motor cars have been warned that subsidies for them will be gradually phased out.

In the Federal Republic of Germany, the philosophy of less government intervention expressed itself in a reduction of the federal budget. Public sector spending as a share of GNP fell from 50 per cent in 1982 to 47 per cent in 1986. It is expected to fall further in 1987, since the forecast for GNP growth (2.8 per cent) is greater than that of budget growth (1.9 per cent). Tax revenues are also expected to fall by 2.9 billion deutsche mark in 1986 and 1987.*

Privatization (or denationalization) represents another aspect of the regional trend towards less government intervention.** Governments claim that privatization improves enterprise efficiency and generates the revenues needed to reduce the public debt. France has announced plans to privatize as many as 65 public enterprises, including several manufacturing firms. Table 11 lists a number of companies to be returned to private ownership in France and other Western European countries. In the Federal Republic of Germany the State share in VEBA has been reduced from 46 per cent to 25 per cent, and in VIAG (an energy, chemicals and aluminium producer) from 100 per cent to 60 per cent.

*More specifically, the EEC currently imports 50 per cent of the microprocessors sold to meet internal demand, 75 per cent of the videotape recorders, and 80 per cent of the microcomputers. Europe's declining share of the market for high-technology products is largely the result of its lagging behind the United States and Japan in investment spending on research and development and capacity expansion. For an analysis of the issue, see Commission of the European Economy [17], chap. 2.

*The government financial deficit fell from 3.7 per cent of GNP in 1981 to 1.1 per cent in 1986.

**See [18], pp. 51-60; [19], pp. 145-162; [20], pp. 18-32; and [21].

Table 11. Sales of public assets in selected Western European countries, 1986-1987

Country	*Utilities*	*Industrials*	*Others*
Austria	Graz-Koflacher Eisenbahn und Bergbau GmbH[p] OMV[p]	Bayou Steel Co. Fepla-Hirsch GmbH[p] Futurit Werk AG[p]	
Denmark		Kryolitselskabet*	
France	TFI[p]	Elf-Aquitaine* St. Gobain* Paribas[p] AGF[p] CGCT[p]	
Germany, Federal Republic of	I.V.G.[p]	VEBA VIAG* Volkswagen[p]* Deutsche Pfandbrief-anstalt[p]* Deutsche Siedlung und Landesrentenbank[p]* Deutsche Verkehrs-kreditbank[p]	
Italy	Alitalia[p]*	Aeritalia* Sirti* Selenia Alfa Romeo[p] Banco Nazionale del Lavoro[p]	
Spain	GESA Iberia[p]	SEAT Secoinsa Textil Tarazona SKF ENTURSA Viajes Marsans	
United Kingdom	Associated British Press British Gas British Telecom Sea Link National Bus Company British Airways[p] British Airports Authority[p]	British petroleum* Cable Wireless Britoil Enterprise Oil British Aerospace Jaguar Inmos Amersham International International Aeradio British Sugar Corporation	British Rail Hotel Uniparts[p] Shorts[p] Rolls-Royce[p] Royal Ordnance[p] North Sea Oil Licence Land Council House Miscellaneous

Source: Organisation for Economic Co-operation and Development.

Note: A superscript "p" refers to prospective. An * indicates initial public sector shareholding less than 100 per cent.

In addition to privatization, Governments are trying to raise the level of cross-country market competition among industrial enterprises in EEC member countries. Many obstacles still remain against the free flow of goods and services in the Community. To eliminate all existing barriers and stimulate competition, the Commission of the EEC unveiled in June 1985 a detailed timetable of measures to be implemented by 1992, including the complete abolition of tariffs, quantitative restrictions and customs formalities, the standardization of tax systems and of regulations to protect consumers and the environment, and new rules for fair competition embracing State subsidy policies.

The enlarged EEC, now including Spain and Portugal,* is expected to provide industries in the Community with the advantages (such as scale economies in research and development, production and marketing) already enjoyed by their competitors in the United States and Japan. To exploit those advantages, a set of common strategy and policy measures has been adopted, including promotion of common research and development activities, encouragement of regrouping and restructuring to master the new technologies and co-operation in labour retraining programmes.

There is an awareness of the urgent need to co-operate in research and development activities so as to form a European technology community large enough to meet technological challenges from Japan and the United States. A number of EEC-wide programmes have been established to this end, including the following:

(a) The European Strategic Programme for Information Technology (ESPRIT), a five-year programme (1984-1988) under which the Community could finance up to 50 per cent of research and development work jointly undertaken by enterprises in different member countries with universities and research institutes as

*The accession of these two countries in 1986 has increased the gross value added of Community industry by 8 per cent and the industrial work force by 14 per cent, and added 50 million new consumers. The value of industrial output has become about equal to that of the United States.

partners in the fields of micro-electronics, high-integration circuits, software techniques, advanced information processing, the computerization of offices and computer-controlled production techniques;

(b) Research and Development in Advanced Communication Technologies for Europe (RACE), designed to encourage research in wide-band fibre-optic networks capable of simultaneously transmitting sound, pictures and computerized information and to build integrated telecommunication services by 1995;

(c) Basic Research in Industrial Technologies for Europe (BRITE), a four-year programme (1985-1988) to develop and spread new processes of manufacture, new products in traditional industries involving assembly techniques, and computerized testing methods to improve product reliability and reduce wear and tear in industries such as textile, leather and household goods;

(d) A common research programme in biotechnology (1985-1989), applicable to agriculture, chemicals and pharmaceuticals involving bioinformatics, enzymes, genetic engineering and toxicology;

(e) EUREKA, a programme established in June 1985 linking the member countries of the EEC and the European Free Trade Association (EFTA) in research and development activities. The programme, with no central fund, only facilitates and promotes direct contacts between European industrialists and researchers by eliminating obstacles, and participants themselves negotiate and determine the type of co-operation and establish the form of project management and funding.

The birth of these institutions reflects the need to break the barriers, such as insularity among technology-using companies and protective national technology policies, that have hindered technological progress in Western Europe. The need to apply research results at the production and marketing stages will require a level of investment beyond the capabilities of individual firms. Policy makers must therefore decide whether to encourage joint ventures, mergers and acquisitions across national boundaries, an example of which is provided by the January 1987 agreement between SGS-Ates of Italy and Thompson of France to merge their semiconductor business.

The heightened awareness of the need for economic integration among Western European countries has been accompanied by fears of an external threat that have led to an increasing number of protective measures in recent years.* The EEC Council has reportedly adopted a resolution that requires an 80 per cent local content for automobiles produced by foreign-owned enterprises in EEC member countries. Similar local content requirements might be applied to other products, such as electronic typewriters, excavators, weighing-machines, compact disc players, semiconductors and copying machines. Anti-dumping investigations and decisions also seem to be increasing (see table 12).

Particularly unsettling for the South is the EEC proposal to extend anti-dumping rules to cover components that developing countries supply to foreign enterprises based in Europe. Intra-industry trade between developed and developing countries typically involves low-price sourcing of intermediate inputs by transnational corporations, a practice that has provided a substantial impetus to the industrialization of selected developing countries (see table 13). If the recent EEC proposal is adopted, this practice may be restricted.

On the whole, the slow growth forecast for Western Europe in 1987 and 1988 (continuing the pattern of 1985 and 1986), combined with rising protectionist pressures, augur ill for trade-induced growth among Western Europe's trading partners. The accession of Spain and Portugal to the EEC may also have the effect of discouraging imports of labour-intensive manufactures from outside the region. Western Europe's contribution to reflation of the world industrial economy seems likely to remain weak.

Table 12. EEC anti-dumping measures, January 1985 to December 1986

Product	*Country involved*	*Type of measure*
Hydraulic excavators	Japan	DD
Electronic weighing scales	Japan	PD
Freezers	German Democratic Republic	PU
	Yugoslavia	PU
	USSR	DD
Photocopiers	Japan	PD
Acrylic fibres	Israel	PU
	Mexico	PU
	Romania	PU
	Turkey	PU
Silicon carbide	China	PU
	Czechoslovakia	PU
	Norway	PU
	Poland	PU
	USSR	PU
	Yugoslavia	PU

Source: Commission of the European Communities, cited in *Financial Times*, 4 February 1987.

Note: PU: price undertaking; PD: provisional duty; DD: definitive duty.

D. Eastern Europe and the Union of Soviet Socialist Republics

In their plans for 1986 the European centrally planned economies, including the Soviet Union, set targets that represented an improvement on the region's growth performance by an average of 0.8 per cent over the 1985 results. That objective was in fact attained, the figures recorded being well above the average for the period 1981-1985. While the economic performance of the smaller Eastern European countries fell short of the target, in the Soviet Union it was actually exceeded (see table 14 for country details of growth performance).

While the plans for 1986 were met for the region as a whole, in some countries, notably Hungary and Romania, economic planners have clearly felt that conditions will no longer be so favourable, and have set lower target for 1987. In contrast, planners in other countries, including Bulgaria, Czechoslovakia

*For a discussion of the "threat argument", see A. Pfaller [22].

Table 13. Average[a] levels of intra-industry trade[b] and stages of development, 1978

Country grouping	Total trade	Trade with market economies only	Trade with all developing countries	Trade with selected developing countries only
Developed market economies	0.59	0.64	0.21	—
Developing countries[c]	0.15	0.10	0.22	—
Selected developing countries	0.42	0.48	0.38	0.31

Source: David Greenaway and Chris Milner [23], p. 96.

[a]Arithmetic average across countries of the Grubel and Lloyd summary index.

[b]In manufactures.

[c]Excluding selected developing countries.

Table 14. Actual and planned growth rates of net material product: Eastern Europe and USSR, 1985-1987

(Annual average percentage rates based on constant prices)

Country	1981-1985		1985		1986		1987	1986-1990
	Actual	Planned	Actual	Planned	Actual	Planned	planned	planned
Bulgaria	3.7	3.7	1.8	4.1	5.5	4.0	5.2	5.4
Czechoslovakia	1.8	2.0-2.6	3.0	3.2	3.2	3.5	4.0	3.5
German Democratic Republic	4.5	5.1	5.2	4.4	4.3	4.4	4.5	4.6
Hungary	1.3	2.7-3.2	−1.4	2.3-2.8	0.5	2.3-2.7	2.0	2.8-3.2
Poland	−0.8	3.2-3.8	3.4	3.0-3.5	5.0	3.1-3.4	3.0-3.5	3.0-3.5
Romania	4.4	6.7-7.4	5.9	10.3	7.3	12.0	8.0-9.0	10.3
Subtotal	2.2	4.2	3.7	4.6	4.7	5.1	4.8	5.2
USSR	3.6	3.8	3.5	4.3	4.1	3.9	3.9	4.3
Total	3.2	3.9	3.5	4.4	4.3	4.3	4.1	4.6

Sources: National press, *Planovoe Khozyaistvo 3/1987*, and estimates by UNIDO/SR/GLO.

and the German Democratic Republic, have raised their earlier plan targets for 1987, while the target of the Soviet Union remains the same. Thus the region's planned growth for 1987 turns out to be 4.1 per cent —slightly below the 4.3 per cent achieved in 1986.

However, UNIDO forecasts growth rates of net material product (NMP) of 3.8 per cent and 3.6 per cent for 1987 and 1988 respectively, and MVA growth of 4.9 per cent and 4.6 per cent for the region as a whole. Within manufacturing, plastic products, electrical machinery and industrial chemicals will probably be leading other industries during the 1987-1988 period, following closely the conventional pattern of structural change in industry (see figure VII).

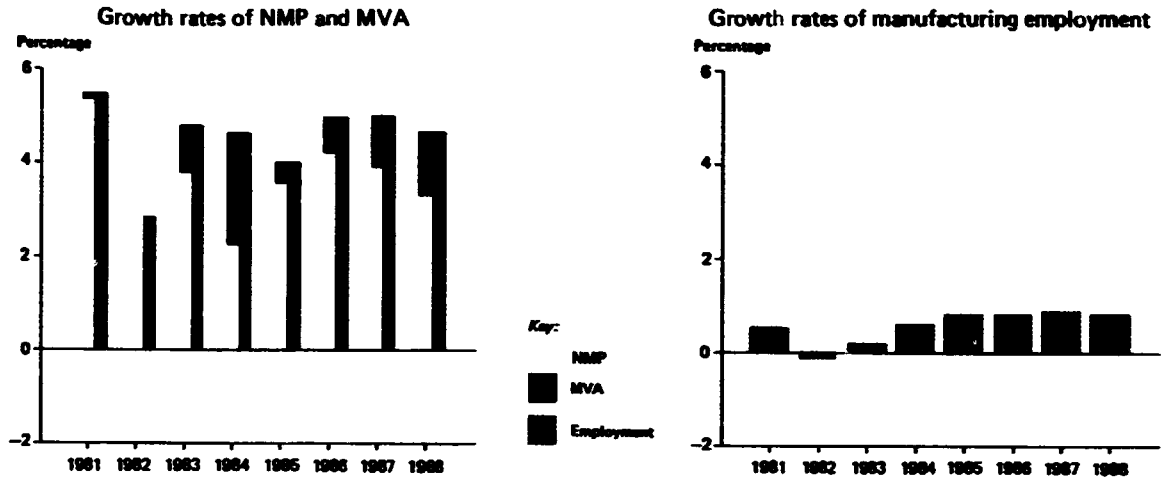
Behind these projection figures are several opposing factors working against each other. On the positive side, salient factors include the expected effects of the modernization drive and revitalization of existing firms, encouragement of joint ventures with enterprises of developed market economies, a structural shift towards high-technology areas supported by trade liberalization measures and decentralization of decision-making (although on an experimental basis) with incentives based on performance. Unfavourable factors include slow trade prospects due to a sluggish growth of the world economy, shortages in foreign exchange availability due to declines in oil prices (the major export item of the USSR), and consequently a somewhat lower level of planned domestic investment.

One of the main concerns is the sluggish outlook for trade. For 1986 the region's convertible currency foreign trade surplus fell from $2.1 billion to $1 billion. Exports of the OECD countries to the region fell by 8.4 per cent in real terms (though they rose by 9 per cent in dollar terms), with the drop in exports to the Soviet Union (of 15 per cent in real terms) being particularly marked. There was, however, an increase in purchases of technologically sophisticated capital goods such as oil and gas engineering goods and pipe manufacturing machinery. Food and live animals, traditionally the leading category in United States exports to the centrally planned economies, has now been displaced by machinery and equipment exports as the most important export item.* The bumper harvest in 1986 enabled the region, particularly the USSR, to curtail imports of foodstuffs. Whether 1987 will see similar bumper crops is difficult to predict.

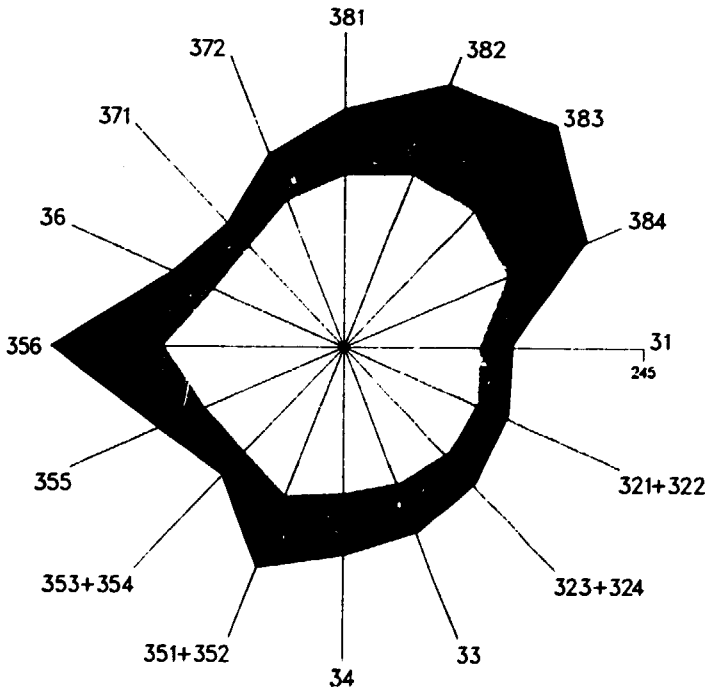
Another major concern relates to the price of oil. In the first half of 1986 alone, the fall in the price of oil led to a steep decline of 47 per cent in the export revenues of the Soviet Union, where energy exports account for three quarters of all foreign exchange earnings. In an attempt to compensate, the volume of oil exports was increased (as were gold sales) and the volume of imports from the West was sharply reduced. There was a reduction in imports of machinery and equipment from developed market economies, and numerous turnkey projects were cancelled. Efforts to economize on scarce foreign exchange appear to have compelled a shift in industrial investment priorities

*Based on data for January-September 1986.

Figure VII. Growth rates of NMP, MVA and manufacturing employment, 1981-1988, and industrial structural change, 1975-1988: Eastern Europe and USSR



Industrial structural change
(Index of value added: 1975 = 100)



g =	4.33
θ =	12.68

Key:

ISIC code	(industries):
31	(Food products)
321, 322	(Textiles)
323, 324	(Leather industries)
33	(Wood and furniture)
34	(Paper and printing)
351, 352	(Chemicals)
353, 354	(Petroleum and coal)
355	(Rubber products)
356	(Plastic products)
36	(Non-metal mineral products)
371	(Iron and steel)
372	(Non-ferrous metals)
381	(Metal products)
382	(Non-electrical machinery)
383	(Electrical machinery)
384	(Transport equipment)

Constant prices of 1980

g = Average annual growth rate, 1970–1988 (percentage)

θ = Index of structural change, 1970–1988

1985–1988 forecast
1980–1985
1975–1980

Sources: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

from very large new projects to the modernization of existing industrial plant and equipment.

Falling oil prices also means that the Eastern European countries have lost markets for their manufactured goods due to the loss in buying power of their most important third world markets (for example, Iran (Islamic Republic of), Iraq, Libyan Arab Jamahiriya and Syrian Arab Republic), where trade surpluses previously helped countries such as Bulgaria, Czechoslovakia, the German Democratic Republic and Poland finance imports from the developed market countries.

The slow growth of the region's trade, coupled with the scarcity of foreign exchange earnings, seems to have contributed, at least in part, to the lower level of investment envisioned for 1987. In 1986, the actual level of investment in the three largest economies of the region—USSR, German Democratic Republic and Czechoslovakia—exceeded the planned level, but for these same economies the level of investment planned for 1987 is below the level attained in 1986. Planners in these three major economies thus expect lower levels of industrial output in 1987 than were achieved in 1986 (see table 15). Indeed, industrial growth for the region as a whole is "planned" to decline to 3.9 per cent in 1987 from the 4.8 per cent achieved in 1986.

Table 15. Planned growth rates of gross industrial production: Eastern Europe and USSR, 1986-1990

(Annual average percentage rates based on constant prices)

Country	1986		1987	1986-1990
	Actual	Planned	planned	planned
Bulgaria	4.3	4.5	5.0	4.9
Czechoslovakia	3.1	2.6	3.0	3.0
German Democratic Republic	4.3	3.8	3.8	3.7-4.1
Hungary	1.8	2.0-2.5	2.0-2.5	2.7-3.0
Poland	4.4	3.2-3.6	3.4	3.0
Romania	7.7	8.0-9.0	6.0-7.0	7.5-8.3
Subtotal	4.7	4.4	4.1	4.4
USSR	4.9	4.3	3.8	4.6
Total	4.8	4.3	3.9	4.5

Sources: National press, *Planovoe Khozyaistvo 3/1987*; Economic Commission for Europe; and estimates by UNIDO/SR/GLO.

Against the background of the unfavourable external conditions, the general strategy to cope with them as announced in 1986 is to liberalize trade and foreign investment through joint ventures, coupled with some limited decentralization in decision-making at the enterprise level.

In the foreign trade sector, the region's foreign trade systems are being progressively decentralized. There is a desire to increase co-production arrangements and strengthen licensing agreements, and new legislation, such as that of Czechoslovakia, Poland and the Soviet Union on joint ventures, has created greater opportunities for the involvement of developed market economies in their industrial development. Experience suggests, however, that the process of change implied in the new legislation on joint ventures, for example, will not take the form of an overnight transformation, but that there will be a need for an extended process of learning-by-doing on both sides.

As the USSR authorities have stated, such reforms were introduced because of the realization that a closed economy runs counter to attempts to be among the technological leaders in a wide range of new and advanced technologies. Moreover, as is the case in economic policy-making in general, their success requires that the appropriate concomitant domestic policies be applied, including measures to increase the initiative of management and the industrial labour force and to delegate more decision-making authority to the industrial enterprises.

Despite the reforms, however, the reality of the continuing foreign exchange shortages and the fact that many Eastern European manufacturers do not find a ready market in the developed market economies—notable exceptions being iron, steel, some textiles and chemicals—suggest that the pressures to engage in counter trade will simultaneously increase rather than decrease.

A further aspect of the new approach to foreign trade is the increase in contacts between the individual countries of the region and the EEC, as opposed to the previous policy of bloc-to-bloc contacts. These efforts are in part at least motivated by efforts by the Eastern side to redress the existing trade imbalance, whereby 3-4 per cent of total Western European trade is with the countries of the Council for Mutual Economic Assistance (CMEA), whereas 20 per cent of CMEA exports go to Western Europe. Moreover, the Soviet Union has indicated that its decision to allow State companies to conduct foreign trade on their own under the new economic policies* was directly linked to its bid—which the delegates did not endorse—to participate in the Punta del Este round of global trade negotiations and gain observer status in the General Agreement on Tariffs and Trade (GATT).

Over the long run the European centrally planned economies have five major priority areas for investment, research and development and intra-regional co-operation. These areas—electronics, automation, nuclear power, new materials and biotechnology—will also be those where the interest in East-West trade will be the greatest. Each of the 93 selected projects in these areas, which will be jointly carried out in several different CMEA countries, will be directed by a separate leading body, which will bear responsibility for the technical level and quality of the products, the observance of the planned timetable in both research and production, as well as for controlling the costing of the project and its delivery to the final customer.

These high-technology industries are also areas in which the Eastern European countries feel an urgent need to innovate. Thus, even in the German Democratic Republic, one of the most technologically and economically advanced economies in Eastern Europe, large-scale production of personal computers only began in 1986, whereas the first ones came on the market in the United States in 1975 and in the Federal Republic of Germany in 1979/1980; and in micro-

*As of 1 January 1987 the right to engage in foreign trade was granted to 21 ministries and State communities and almost 70 enterprises, economic associations and research organizations.

processors and integrated circuits experts estimate that the country is roughly one "chip generation" behind the world technological leaders. At the same time, the German Democratic Republic is currently planning an annual increase of 26 per cent in the output of its electronics sector by 1990, when it also plans to attain an annual production of 80,000 robots and 90,000 computer-aided design and manufacturing (CAD/CAM) work stations.

A key element in the planned programme of closer integration within the Eastern European region is production specialization and co-operation at the enterprise level. While in the EEC intra-firm trade accounts for approximately 40 per cent of all trade in goods, in the European CMEA countries the corresponding figure is only 3-4 per cent. Existing enterprises are also said by experts from the region often to have production runs that are too small and to be insufficiently specialized. Such an observation is applicable to enterprises in Czechoslovakia, for example, which account for 65 per cent of the total machine-building industry of the region. The stimulation of joint enterprises involving two or more countries of the region would have an effect of stimulating competition, increasing the level of production technology and raising the quality of output.

In an attempt to broaden the scope of these new initiatives, UNIDO proposes to foster industrial investment co-operation at the enterprise-to-enterprise level and tripartite co-operation among developing countries, developed market economies and centrally planned economies. This new initiative would complement existing training programmes and workshops undertaken in technology acquisition and industrial project preparation, evaluation and financing.

East-South trade can be expected to represent the most dynamic component of world trade over the short to medium term, and developing countries may well offer the fastest expanding market for the exports of the European centrally planned economies and serve as the fastest growing source of imports. In this trade, the interests of the centrally planned economies in East-South trade will continue to be focused on obtaining raw materials, energy and agricultural products and marketing their manufacturing products.

E. Latin America

Despite the prevailing adverse external conditions (such as the net resource outflow from the region of some $22 billion), the year 1986 registered a substantial improvement in growth performance over the previous year. The region's GDP grew by 3.6 per cent compared with 2.9 per cent in 1985, and MVA by 6.7 per cent, more than double the 1985 growth of 3.2 per cent. In general, non-oil-exporting countries (for example, Argentina, Brazil and Chile) performed better than oil exporters in the region (Mexico and Venezuela).

Much of the driving force for growth on the demand side came from domestic factors, particularly consumer demand, supported by wage increases and government expenditures, albeit under price controls, in an attempt to suppress inflationary pressures. External demand for the region's commodities remained depressed, while investment expenditures declined owing to the shortage of savings, high domestic rates of interest (an extreme case being the 65 per cent real rate in Argentina), idle capacity and uncertainty about the future. Foreign direct investment, once a powerful factor in the region's industrial development, has virtually dwindled to naught except for a few debt-equity conversion deals.

On the supply side, a common characteristic of industrial growth in the region in 1986 has been the greater utilization of excess capacities. It will therefore be vital for many countries in 1987 to manage the transition from a demand-led growth pattern utilizing idle capacity to a growth path balancing demand and supply expansion. Encouragement of investment would seem a logical course of policy action, particularly in the case of falling international interest rates which should be translated into better credit terms for the industries of the region.

The outlook is for a growth performance in 1987 and 1988 similar to that achieved in 1986. GDP is expected to grow at 3.6 per cent and 4 per cent, and MVA at 4.4 per cent and 5.2 per cent for the respective years. Within the manufacturing industry, the growth-leading subsectors include petroleum and coal products, industrial chemicals and iron and steel. These resource-based industries appear to possess great comparative advantages in contrast to transportation equipment and non-electrical machinery, which actually contracted during the 1980-1983 recession period (see figure VIII).

These projections may be regarded as more of an optimistic target than a forecast, considering the constellation of external and internal problems that the region faces. The service requirement of the huge external debt (over $400 billion for the region) is likely to continue siphoning off the region's savings; the slow growth foreseen in the North can hardly be expected to spur demand for the region's exports.* On the domestic front, the mounting inflationary pressures and already severely distorted prices under a price control system seem to leave little scope for vigorous government spending through money creation. Some countries have suffered from the vicious circle of increasing budget deficits in order to pay interest on snowballing public debts. Curtailing budgets without counterbalancing thrusts from other sources would, however, give rise to deflationary pressure. The dilemma can perhaps be solved by business sector investment, but at the moment the prospects for such investment are still uncertain, though the situation differs considerably from one country to another.

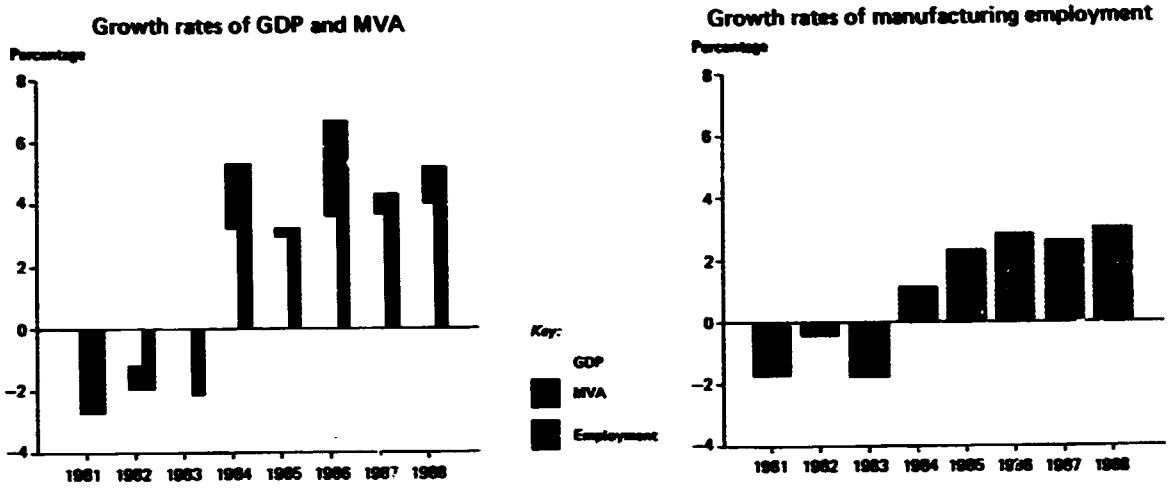
A brief review of the economies of Brazil, Mexico and Argentina below will help to illuminate the problems of industrial growth facing the region. These countries accounted for 76 per cent of the region's MVA and 73 per cent of its GDP in 1986.

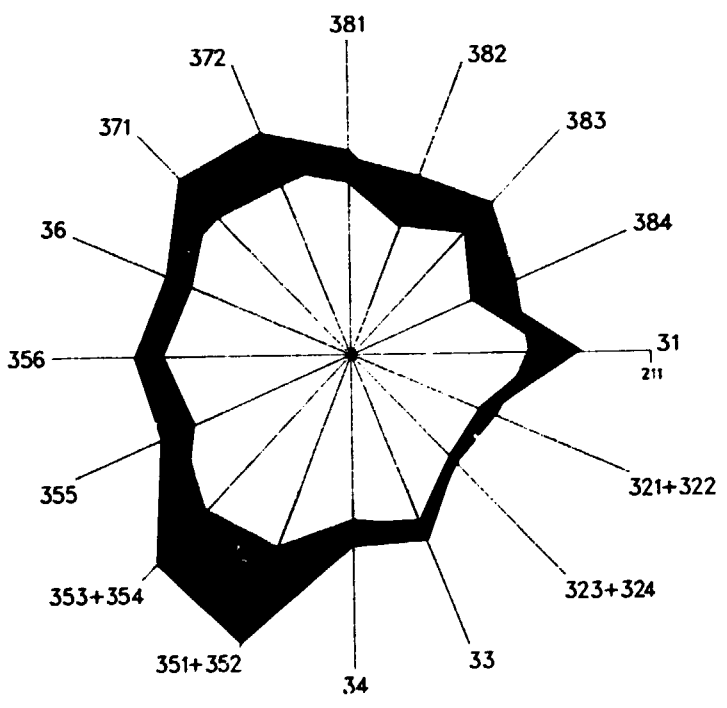
1. Brazil

Brazil, the largest economy in the region, recorded in 1986 an 8 per cent growth of GDP, led by the manufacturing sector with an MVA growth of over

*For a discussion of North-South interdependence in the western hemisphere, see Alfred J. Watkins [24].

Figure VIII. Growth rates of GDP, MVA and manufacturing employment, 1981-1988, and industrial structural change, 1975-1988: Latin America





g = 2.96
θ = 10.46

Key:

ISIC code	(industries):
31	(Food products)
321, 322	(Textiles)
323, 324	(Leather industries)
33	(Wood and furniture)
34	(Paper and printing)
351, 352	(Chemicals)
353, 354	(Petroleum and coal)
355	(Rubber products)
356	(Plastic products)
36	(Non-metal mineral products)
371	(Iron and steel)
372	(Non-ferrous metals)
381	(Metal products)
382	(Non-electrical machinery)
383	(Electrical machinery)
384	(Transport equipment)

Constant prices of 1980

g = Average annual growth rate, 1970–1988 (percentage)

θ = Index of structural change, 1970–1988

1985–1988 forecast
1980–1985
1975–1980

Sources: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

10 per cent.* Since 1983, when MVA declined by 6.3 per cent, the manufacturing sector has been pushing the economy at an accelerated pace, growing at 6 per cent in 1984 and 9.1 per cent in 1985 (see table 16 for a breakdown of manufacturing output growth in 1985). However, a somewhat lower MVA growth is expected in 1987 and 1988 (7.2 per cent each year). It seems that the well-publicized Cruzado Plan** ran its course during 1986, and now the economy, under the new austerity programme, is expected to slow down to 3-3.5 per cent GDP growth in 1987.

Table 16. Production of principal manufacturing industries: Brazil, 1985

(Percentages)

Industry	Share of value, 1980	Change of volume, 1985
Non-metal products	4.1	7.5
Metallurgy	13.8	7.0
Machinery	7.8	10.1
Electrical equipment	5.3	19.3
Transport equipment	7.7	11.7
Pulp and paper	2.8	6.4
Chemicals	19.1	6.5
Plastics	2.1	11.3
Textiles	6.9	13.6
Clothing, shoes and woollens	3.5	7.5
Food products	13.8	0.1
Total including others	100.0	8.3

Source: Fundaçao Instituto Brasileiro de Geografia e Estatistica.

The Cruzado Plan had some positive results in 1986. In 1984 the economy benefited from buoyant export demand, exports of manufactured goods growing by 37 per cent. But in 1985, during which the growth of the world economy slowed, manufactured exports plummeted to a negative growth, −5 per cent. Fortunately, domestic demand for consumer durables more than offset the decline in export demand, reflecting government action to increase wage income (an element in the Cruzado Plan). Real wages were raised twice in 1985, totalling an increase of over 12 per cent. Another 8 per cent increase in real wages was implemented at the end of February 1986. The change of the "locomotive force" from export demand to domestic consumption was carried into 1986 and helped maintain consumer demand for automobiles, colour television sets, clothing, manufactured foods etc.

*In contrast, the agricultural sector declined by 5 per cent in the same year

**In order to stem inflation and provide a more favourable climate for investment, the Government introduced a stabilization programme in February 1986—generally known as the Cruzado Plan. The main features of the Plan (abandoned as of February 1987) consisted in freezing retail prices, deindexation of all contracts (including wages, rents, bank deposits, bonds, pension insurance, loans and financial assets of enterprises) and the replacement of the cruzeiro by the cruzado, worth 1,000 units of the old currency. However, there remained a number of immediate policy problems to be tackled, such as properly phased decontrol of the price freeze in the face of increasing black market activities, mobilization of domestic savings by curtailing the consumption boom, stopping the flight of capital as exchange rates became increasingly out of line, and the mounting pressure of reinflation fed by the growing money supply.

Idle capacity decreased to an average of 10 per cent in 1985 from 50 per cent in 1983. Domestic sales proved to be stronger in contrast to the previous two years (1983-1984), when exports surpassed home sales. In early 1986, the waiting-time for capital goods purchases averaged 30 weeks.

Although complete data are not yet available, an upward trend in demand for capital goods was reported in 1986. According to one estimate, industrial investment demand increased by 9.6 per cent during the first half of that year and is expected to increase by a further 10.7 per cent during the second half. These estimates compare with an increase of 4.6 per cent and 8.5 per cent for the first half and second half of 1985, respectively. The breakdown of the investment growth by industry is shown in table 17. The textiles industry leads with 14.1 per cent growth of investment expected in the second half of 1986, followed by machinery (12.1 per cent), food products (12 per cent) and transport equipment (10.7 per cent).

Table 17. Semi-annual growth rates of investment for capacity expansion in Brazilian industry, 1985 and 1986

(Percentages)

Industry	1985		1986	
	First half	Second half	First half	Second half
All industries	4.6	8.5	9.6	10.7
Food	4.5	11.0	7.6	12.0
Textiles	6.6	13.5	10.3	14.1
Chemicals	5.5	11.1	9.3	9.0
Metal products	4.5	12.2	5.8	9.1
Machines	4.8	11.6	10.0	12.1
Electrical machines	2.1	3.6	9.6	6.8
Transport equipment	7.5	14.3	10.0	10.7
Construction	2.3	10.7	17.2	14.1
Commerce	3.9	8.9	6.9	12.9

Source: *Exame* (economic magazine published in Brazil).

The high-investment growth industries (foods, textiles, machines, transport equipment) are characterized by a relatively high level of private, as against government or foreign, capital ownership. The Government has announced a policy to accelerate private investment activities in these and other private industries by doubling the speed of capital depreciation allowance for two years (1986 and 1987). Private ownership is expected to increase further even in industries where the State enterprise has been dominant, for example, steel, chemicals and mining. The Government is reported to have drawn up a list of 47 State enterprises with a total book value of about $1 billion to be offered to private investors. Already a small steel mill has been sold under the privatization plan. But such a privatization plan would appear rather modest compared with the total book values of over $60 billion owned by approximately 200 State-owned enterprises (including the 47 to be sold).

The Government is also reported to be preparing a plan to assign a new role to foreign direct investment, which has supported the import-substitution activities in the past. The Government now expects transnational corporations to help earn foreign exchange through increased exports and to bring in new tech-

nology, particularly in high-technology areas. In the industrial policy plan for the 1986-1989 period, emphasis is placed on the information industry, electronics, fine chemicals (as opposed to basic chemicals), pharmaceuticals, and the development of new industrial input materials such as high-technology ceramics and alloys.

2. *Mexico*

Plunging oil prices hurt the oil-dependent Mexican economy in 1986, with a decline of GDP by −4 per cent and MVA by −2.1 per cent. This growth performance reflected a drastic decline of export revenues by 29 per cent in the first 11 months of 1986.* The low oil prices also meant a reduction of government revenues by 22 per cent or about 6 per cent of GDP. Total investment fell by 16 per cent in real terms, while foreign direct investment fell 26 per cent (against the first half of 1985). Countering these deflationary forces, the Government resorted to deficit financing that reached a record height in 1986, with the Government borrowing 45.3 per cent of public expenditures (see table 18 for trends since 1978). The budget deficit climbed to 16.8 per cent of GDP in 1986,** compared with 8.4 per cent in 1985.

Table 18. Federal consolidated budget, debt service and borrowings: Mexico, 1978-1987

Year	Budget (billions of pesos)	Debt service (percentage)	Borrowing (percentage)
1978	912	25.2	31.9
1979	1 310	25.8	30.5
1980	1 778	26.2	27.7
1981	2 573	24.6	29.9
1982	4 576	31.4	35.6
1983	7 108	39.7	31.9
1984	13 297	39.5	28.8
1985	20 600	41.7	32.2
1986	41 700	42.3	45.3
1987 (projection)	86 800	54.7	45.3

Source: Latin American Markets, Financial Times Biweekly Issue, No. 147 (1986), p. 4.

The most severely hit by the recession appears to be the transport equipment industry, where a 22.5 per cent decline in output was reported in 1986, followed by wood products (−12.3 per cent), rubber products (−11.5 per cent), steel (−3 per cent) and cement (−0.2 per cent). In contrast, an increase of 20 per cent was reported in the production of television sets, which may have had something to do with the world cup games held in Mexico. Basic petrochemicals also recorded an increase of about 10 per cent. Although the currently available information for 1986 are scattered and provisional, automobile and base metals seem to have been victimized most severely during the 1982-1983 recession period (see table 19).

*Imports were down by 1.4 per cent, resulting in a trade surplus of $3.5 billion in the same period.

**The much-discussed United States budget deficit amounted to only about 3 per cent of GDP in 1986.

Table 19. Growth rates of industrial output by selected industries: Mexico, 1980-1984

Industry	1980	1981	1982	1983	1984[a]
Food	4.5	5.6	5.0	−3.1	2.0
Textiles and clothing	2.4	6.0	5.8	−4.5	—
Paper and derivatives	10.3	2.6	1.7	0.2	5.0
Chemical products	8.3	6.7	0.2	−1.2	5.0
Base metals	3.4	3.5	−8.8	−3.7	8.0
Automobiles	19.6	18.6	−18.4	−37.9	25.0
Manufactures	7.2	7.0	−2.9	−9.5	6.0
Total industry	9.2	8.6	−1.6	−8.0	6.0

Source: Ministry of Planning and Budgeting, Mexico.
[a]Estimate.

The outlook for 1987 and 1988 is for a gradual improvement in growth performance. GNP is expected to rebound modestly at 2 per cent and 4 per cent respectively, and MVA at 3 per cent and 7 per cent. Backing up these projections are the likely return of oil prices to $18-$20 per barrel from below the $10 once reached in 1986, expected low international rates of interest (easing the burden of debt servicing on $95 billion in external debts), continued government investment to support pump-priming and a set of policy reforms aimed at revitalization of the industrial sector, which is expected to replace oil as the major foreign exchange earner in the long run.

The Government announced in late 1986 a policy reform package including three basic strategic elements, namely export promotion, trade liberalization and privatization. The precise rules of application have yet to be spelled out, but a sufficient amount of detail is known to permit the following brief description of the measures.

The new export promotion measures include: access for indirect exporters* to preferential taxes, duties and financing (Mexican pesos as well as hard currency); elimination of prior approval procedures for imports used for export production (great savings in red tape); rebates of indirect taxes plus refund of the value added tax on exports; authorization of exporters to use up to 100 per cent of their export earnings to prepay imports; and access to low interest loans for export financing.

Trade liberalization is a concomitant of the export promotion strategy, since a high level of protection usually has indirect anti-export effects. The current levels of tariff range from 25 to 40 per cent on average, but are gradually being reduced towards the target of a five-tiered system ranging from zero to 30 per cent in two to three years. Mexico is set to become a member of GATT, which means that the country will comply with the requirement of a freer trade regime (particularly with regard to import licensing and foreign exchange restrictions). This move would expose industrial enterprises that have been protected under the past policy of import substitution to greater pressure from international competition.

Privatization along with new incentives for foreign direct investment represents another strategic shift

*Indirect exporters are domestic suppliers of input materials used by export producers (the latter have already been enjoying various export incentives).

from past policy practices relating to Mexico's industrialization. The Government has worked out a programme to withdraw (by selling parastatal enterprises) from several industries, including cement, soft-drink bottling, light fixtures, home appliances, bicycles, garments, textiles and perhaps automotive parts and basic metals. Unviable subsidy-consuming parastatal firms will be shut down. The pace of privatization will reportedly step up, so that only 159 units would be retained by 1988 (from 412 at the end of 1986).

In conjunction with the internal privatization programme, foreign private investment has been granted a new incentive through debt-equity swaps. Foreign investors can buy Mexican external debt at a discount of as much as 30 per cent and then convert it into pesos at the face value to be used for investment in new Mexican projects on joint ventures. In 1986, the first year of debt-equity swap transactions, deals worth approximately $650 million were permitted. The Government expects debt-equity swaps worth $100 million per month in 1987. Although some worry that too many swaps may jeopardize the control of monetary policy, the sum envisaged is minute compared with the existing external debt of over $100 billion. Their importance will lie not in their impact on the debt as such, but in the incentive they are to provide for new foreign direct investment in the country when they are combined with other revitalization measures.

The implementation of these measures would presumably improve growth prospects in Mexico. But policy challenges still remain in the form of mounting budget deficits, capital flight and triple-digit inflation.

3. *Argentina*

Despite continuing unfavourable external and internal conditions, the manufacturing sector bounced back in 1986 (January-September) with a growth rate of 14 per cent over the same period in the previous year. This performance sufficed to cover the decline of MVA by 9.1 per cent in 1985 and also to sustain GDP growth of 6 per cent in 1986 (GDP had declined by 4.4 per cent in 1985). The outlook for 1987 and 1988 is for a continuation of recovery though at a somewhat reduced pace, with GDP growing at 5.9 per cent and 4.9 per cent respectively, and MVA at 10.5 per cent and 8 per cent.

The plunge in GDP and MVA growth in 1985 may be regarded as the price paid under the *Plan Austral* for fighting the triple-digit inflation that ravaged the economy in the past. The *Plan Austral*, introduced in June 1985, contained five principal objectives: to stop inflation; to reduce current account deficits; to eliminate external payments arrears by early 1986; to liberalize the exchange and trade regimes slowly; and to decontrol prices, wages and financial markets once inflation had been beaten. The policy tools used to help achieve the objectives included monetary and fiscal measures with drastic budget cutbacks,* wage and price freezes, and rigid controls of exchange rates, imports and exports.

*In 1985, the budget deficit fell from an equivalent of 12.5 per cent of GDP in the first half to 2.5 per cent in the second half.

The immediate impact of these policies was deflationary, hitting the manufacturing sector harder than other sectors of the economy (see tables 20 and 21). Among the worst hit industries were non-metal minerals (−22.3 per cent), textiles and leather (−22.2 per cent), machinery and equipment (−18.4 per cent),* and wood and furniture (−14.3 per cent). The food processing and beverages industry had a zero growth rate, showing a resilience based on linkages to the agricultural sector, in which the country has strong comparative advantage.

Table 20. Growth of gross domestic product by industry: Argentina, 1985

Industry	*Percentage share*	*Real percentage change*
Agriculture, livestock, forestry and fishing	15.9	−2.6
Mining	2.8	−3.6
Manufacturing	23.0	−10.6
Construction	3.5	−8.2
Public utilities	4.7	1.4
Distributive trades and catering	12.8	−7.7
Transport, storage and communications	11.7	−3.6
Financial services	7.8	−1.4
Social and personal services	17.8	1.8
Total GDP, factor cost	100.0	−4.5

Source: Banco Central de la República Argentina.

Table 21. Growth of manufacturing output: Argentina, 1985

Industry	*Percentage share*	*Real percentage change*
Food, beverages and tobacco	26.0	0.0
Textiles and leather	8.6	−22.2
Wood and furniture	1.2	−14.3
Paper and printing	5.4	−3.3
Chemicals	17.9	−5.7
Non-metal minerals	3.9	−22.3
Metal working	6.2	−7.9
Machinery and equipment	23.8	−18.4
Other industries	6.9	−10.5
Total	100.0	−10.5

Source: Fundación de Investigaciones Económicas Latinoamericanas, Argentina.

The year 1986 saw a recovery from the harsh blows that had struck the manufacturing sector in the previous year, despite a decline in agricultural output, labour unrest and credit squeezes. Scattered (and provisional) information indicates that in 1986 the production of cement increased by 20 per cent, automobiles by 13 per cent and steel by 11 per cent (for the January-November period), and that there was generally favourable demand for the various categories of non-durable consumer goods based on a

*This corresponds to a 16.8 per cent drop in investment expenditures for the economy as a whole and a 13.7 per cent fall in investment in machinery.

recovery of purchasing power. Capacity utilization in the latter categories improved to 77 per cent in the second quarter of 1986 from 68 per cent in the same quarter of 1985. Comparatively, the capital goods industries would seem to be faring less well, reflecting sluggish investment demand in the economy.

It can be expected however that the next prime movers will be the export-oriented industries. During the 1985-1986 period, the Government announced a series of measures to bolster exports of industrial goods. Export taxes on manufactured goods, which ranged from 4 to 34 per cent, were reduced to 0 to 15 per cent; enterprises that expand exports by $2 million or more annually for at least a two-year period will be granted credit of up to 15 per cent of f.o.b. value; an additional 5 per cent credit will be awarded for opening new overseas markets; the preferential rate on export-finance credits will be lowered from 6.5 per cent per year to 4.5 per cent (a negative real rate of inflation is taken into account); tax rebates of 10 to 15 per cent will be granted to 4,000 industrial products specified for export promotion; regulations on drawback imports will be eased for 11,000 product categories where the unit value of the re-exported items amount to at least three times that of the imported goods. These measures would seem to provide a welcome relief (as well as an advantage) to the cash-starved industrial firms. For instance, during the first round of export-incentive biddings (known as PEEX) in July 1986, 243 companies were granted credits equivalent to 8-15 per cent of exporter's f.o.b. values. These included Goodyear, Ducilo of Du Pont, Duperial, Nestlé and many other transnational corporations.

In addition to the export-promotion measures, the new industrial policy of Argentina includes an invitation of foreign investment in the electronics and petroleum industries and privatization of some State-owned enterprises. New incentive measures for electronics contain a set of novel elements, including the following: corporate tax holidays declining every year by a 20 percentage-point step beginning from 100 per cent exemption in 1988 (exemption drops to 10 per cent in 1993); and import-duty breaks for capital goods and inputs. These incentives are subject to fulfilment of certain conditions, such as 40 per cent self-financing in the total investment, possession of "adequate" technology, generation of export-earnings in a specified period of time, and plant location outside Buenos Aires.

Privatization of State-owned enterprises, though long heralded, does not seem to have progressed much. The announced list of 15 units to be sold includes Yacimientos Petrolíferos Fiscales, SOMISA (steel), Petroquímica Bahia Blanca (petrochemicals complex) and others (mostly infrastructure enterprises). The slow progress of privatization is due to the depressed economic conditions that have deterred potential buyers and the Government's concern that the buyers may lay off redundant labourers, thus adding to unemployment. At any rate, the proposed privatization may dent little of the State sector, which accounts for over 30 per cent of GDP in the country. On the whole, the new policy package is expected to improve the prospective growth of industry, although the threat of a wage-price spiral and capital flight still remains.

F. Tropical Africa

After two years of negative or less than 1 per cent economic growth for Tropical Africa as a whole, many countries in the region experienced an economic upturn during 1985 and 1986, when GDP of the region grew by 2 per cent and 2.7 per cent respectively (see table 22). The upturn was mainly caused by an improvement in weather conditions with favourable effects on agricultural production. The world market for most African agricultural export commodities (except coffee) was weakening however, with the purchasing power of Africa's exports declining by an estimated 1.7 per cent in 1985. In 1986 a further decline of 15 per cent took place, largely reflecting the collapse of oil prices. This had positive effects on the external balances of oil-importing economies, but was damaging to the oil exporters in the region.

Table 22. Growth rates of GDP and MVA: selected countries in Tropical Africa, 1983-1988

(Percentages)

Country or area	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*
Tropical Africa						
GDP	−1.9	0.6	2.0	2.7	2.7	3.4
MVA	−3.3	−0.8	4.1	4.0	3.9	4.6
Cameroon						
GDP	4.5	5.6	7.8	4.9	3.3	2.5
MVA	7.3	6.3	7.4	4.5	2.9	2.2
Kenya						
GDP	3.8	−0.6	3.9	5.3	3.1	3.4
MVA	4.5	2.1	7.1	9.3	5.9	6.3
Nigeria						
GDP	−6.7	−0.4	2.4	1.5	1.7	3.4
MVA	−12.3	−3.1	5.5	4.8	5.0	6.3
Zimbabwe						
GDP	−5.4	−2.0	7.0	0.0	−3.0	1.9
MVA	−3.1	−11.6	4.4	−0.6	−3.1	1.0

Source: Estimates and forecasts by UNIDO/SR/GLO.

Similar patterns of MVA growth can be observed—negative growth in 1983 and 1984 followed by recovery in 1985 (4.1 per cent) and 1986 (4.0 per cent). However, the immediate industrial outlook is not very encouraging, owing mainly to expected balance-of-payments constraints. The outlook for export earnings of Tropical African countries unfortunately does not allow optimism for the immediate future, particularly since the Western European economies (major trade partners of the region)* are expected to grow only slowly in both 1987 and 1988. This has predictably adverse effects. On the demand side, agricultural income determines in large measure the level of consumer demand for manufactured goods. On the supply side, the availability of foreign exchange determines crucially the level of output, since much of the modern industrial sector is dominated by import-substitution based on the assembly of imported inputs (intermediate inputs, spare parts and capital goods). Thus when earnings from primary commodity exports

*Western Europe usually buys over half of Africa's total exports to the world market.

decline, both demand and supply factors work adversely at the same time.

For 1987 and 1988, the region's GDP is expected to grow by 2.7 per cent and 3.4 per cent, and MVA by 3.9 and 4.6 per cent respectively. The growth-leading industries include beverages, petroleum refining and transport equipment. The latter industry is expected to grow by 5.9 per cent in 1987 and 6.9 per cent in 1988, reflecting the region's effort to substitute imports of automobiles by local assembly of knocked-down components (see country examples which follow). This industry has been growing fast from a low base since 1975 relative to other industries (see figure IX).

The vulnerability of industry in the region is also accentuated by the shallow industrial base common in the initial (infant) stage of the industrialization process. Many of the import-substitution industries seem to have been isolated from the domestic resource base (weak linkages to other domestic sectors), with State-owned units enjoying the safety net of subsidies in case of losses and protected by high tariffs and quotas, thus virtually eliminating external competition. As a consequence, infant industries have tended to remain infant and vulnerable to a modicum of exposure to financial difficulties. Recent austerity programmes designed to meet debt obligations have wrought havoc on many of the financially vulnerable firms.

Realizing these shortcomings, policy makers in the region have begun to reformulate their strategies for resumption of industrial and overall growth amid the adverse external conditions prevailing in the region. The policy pronouncements include an emphasis on greater integration of industry with other sectors, notably agriculture (that is, forward and backward linkages), on export orientation and competitiveness, on the need for nurturing small- and medium-scale industries (see box: "Reports of growing interest in small- and medium-scale privately owned industrial enterprises"), on restructuring and rehabilitating State enterprises, including the possibility of privatizing the loss-makers, on the benefit of encouraging joint ventures with foreign concerns and on mobilizing greater participation in the private sector. Though the mixes differ, these elements seem more or less common to many countries of the region, as the following country examples illustrate. The policy mix also appears to commend itself to the least developed countries in the region.

Four countries are selected as examples, one from each subregion, consideration being given to the size of the country and the degree of industrialization: Kenya, from the eastern region; Nigeria, from the western region; Cameroon, from the central region; and Zimbabwe, from the southern region. Together they represent over 50 per cent of the GDP and MVA of Tropical Africa.

1. Nigeria

The largest economy in Tropical Africa and a major victim of plunging oil prices, Nigeria is faced with the task of coping with the crippling effect of foreign exchange shortages in the manufacturing industry. Nigerian industry grew rapidly during the oil boom of earlier years. Oil revenues supported heavy investment projects such as steel, petrochemicals, electrical equipment and automobiles. These projects depend heavily on non-oil imported inputs. But the foreign exchange budget for imports of input materials and spare parts had to be slashed in 1986 to around $2.6 billion, scarcely more than one tenth of the amount available in 1981. As a result, the average rate of manufacturing capacity utilization was reportedly around 20 to 25 per cent in 1986.

The reform package adopted by the Government in 1986 represents a drastic reversal of past policy. The key elements include a flexible exchange rate (through weekly auctions of foreign exchange), relaxation of import and export licensing, selling State-owned enterprises that are making losses and encouragement of commercially viable investments, particularly joint ventures with foreign firms. These measures, though sensible in the long run, appear fraught with new immediate problems.

The new system of auctioning foreign exchange is in effect raising the input costs to manufacturers, while the new (lower) tariff rates have removed much of the earlier protection provided to manufacturers. This double blow might eliminate many fledgling firms that are not yet competitive in international markets, leading to closures and unemployment problems.

Coupled with the liberalization measures, a privatization programme was launched in 1985 with the sale of seven agro-industrial parastatal enterprises under the Ministry of Agriculture. Withdrawal from other parastatal enterprises, including breweries and soft drinks, electrical goods and electronics firms, was also announced.

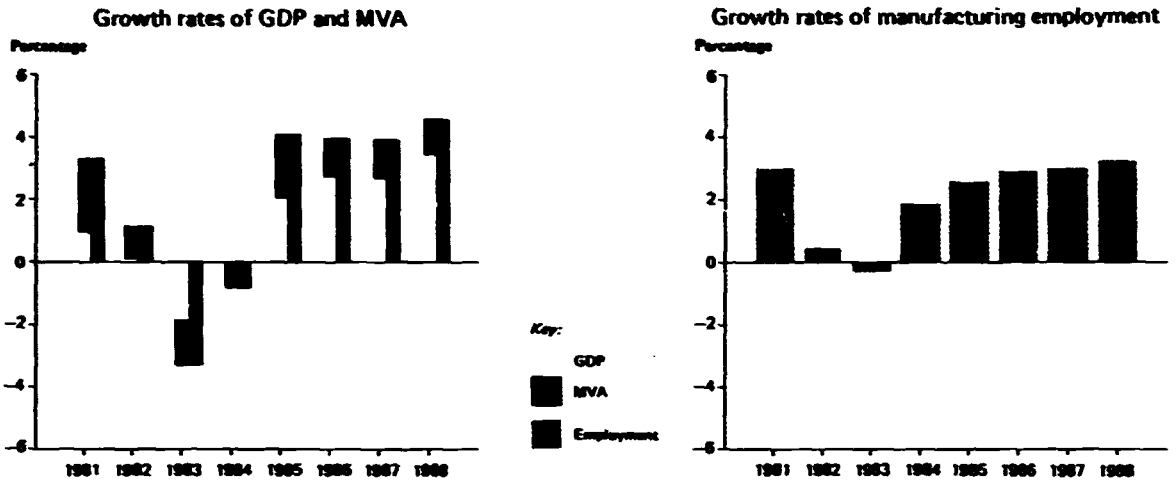
The programme was pushed one step further in 1986 by the appointment of a committee to establish guidelines and a timetable. Some 100 public companies are to be sorted into four different categories depending on full or partial equity sales and on the degree of government support required for operation and investment. Some worry that the privatization move might make the rich richer and the industrial structure more concentrated, since only the financially strong could afford the purchase.

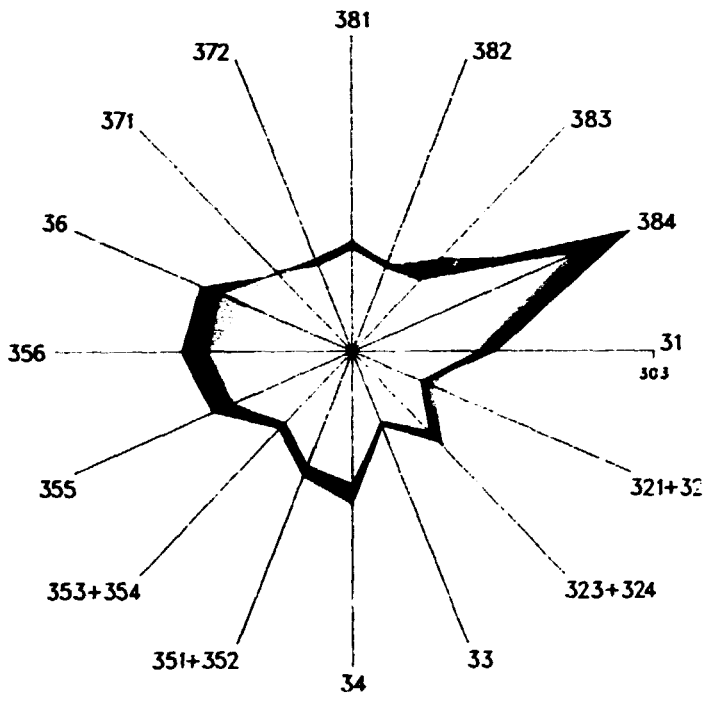
The upheaval in the industrial sector means the continued prospect of low or negative growth in the immediate future. The adverse environment for industrial growth is likely to become more unfavourable as a result of the Government's contractionary macropolicy designed to bring budget and current account deficits under control.

2. Cameroon

With the second largest GDP of the selected countries under study, Cameroon maintained a steady and relatively high growth of GDP and MVA under its fifth five-year development plan (1981-1986). During this period, both GDP and MVA grew by an annual average of about 7 per cent (3.8 per cent growth per capita). This performance, which met the planned growth target, contrasts sharply with that of other countries in the region, which are at the mercy of volatile external influences and unable to meet targeted growth rates. Much of its success would appear to be the result of prudent budgetary policy, despite the

Figure IX. Growth rates of GDP, MVA and manufacturing employment, 1981-1988, and industrial structural change, 1975-1988: Tropical Africa





g = 1.74
θ = 16.06

Key:

ISIC code	(industries):
31	(Food products)
321, 322	(Textiles)
323, 324	(Leather industries)
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34	(Paper and printing)
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384	(Transport equipment)

Constant prices of 1980

g = Average annual growth rate, 1970–1988 (percentage)

θ = Index of structural change, 1970–1988

1985–1988 forecast
1980–1985
1975–1980

Sources: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

Reports of growing interest in small- and medium-scale privately owned industrial enterprises

A priority area in the technical assistance programme of UNIDO is the promotion of small- and medium-scale industries, most of which are privately owned by indigenous enterpreneurs. Reports recently received by UNIDO indicate that Governments of developing countries, especially in Africa and Asia, are also placing increased emphasis on this aspect of industrial development. The following extracts from reports by Senior Industrial Development Field Advisers (SIDFAs) and Junior Professional Officers (JPOs) and from country programme summaries of the United Nations Development Programme (UNDP) illustrate the trend:

(a) Comoros: UNIDO has proposed for the 1992-1996 UNDP Country Programme $300,000 to assist in promotion of small- and medium-scale industries (SIDFA, 28 January 1987);

(b) Rwanda: Small- and medium-scale industry is now considered (by the Government) the main avenue to industrialization (JPO, 26 January 1987);

(c) United Republic of Tanzania: Mbeya area has potential especially for small- and medium-scale industries (SIDFA, January 1987);

(d) Tunisia: The 1987 budget will emphasize private investment and encourage small- and medium-scale enterprises (JPO, 12 February 1987);

(e) Bangladesh: In 1987 the Government will continue the recent emphasis on encouragement of private enterprise and small-scale industry (SIDFA, 21 January 1987);

(f) Bangladesh: Small-scale industry contributes 4 per cent to GDP (almost half of MVA). A recent conference identified problems of the sector as lack of co-ordination between government agencies, technological requirements and lack of financial support (SIDFA, 17 January 1987);

(g) Sri Lanka: Although the public sector presently accounts for 60 per cent of industrial production, a programme for privatization is anticipated in 1987 (SIDFA and JPO, February 1987);

(h) Thailand: In the Sixth Development Plan the private sector will play a leading role, with a new policy of less government control, but more support (JPO, 11 February 1987);

(i) Mozambique: Within the context of a major rehabilitation programme funded by the World Bank, a number of small- and medium-scale projects developed by UNIDO are being implemented (UNDP Third Country Programme 1987-1991);

(j) Liberia: Present government economic objectives include development of indigenous entrepreneurial capabilities particularly in small-and medium-scale industries. UNIDO is providing technical assistance, in the form of extension services (UNDP Fourth Country Programme 1987-1991);

(k) Zaire: UNIDO is currently implementing a major technical assistance project on promotion of small- and medium-scale enterprises (UNDP Fourth Country Programme 1987-1991).

A recent UNIDO report* identifies the following reasons for supporting small-scale industries:

(a) They provide the seed-bed for growth;

(b) They stimulate indigenous entrepreneurship;

(c) They mobilize capital not otherwise generated in the economy;

(d) They save scarce capital and employ less scarce labour;

(e) They can be developed on a decentralized basis in rural and semi-urban areas to meet local demand;

(f) They provide linkages to agricultural and rural activities;

(g) They use simple technology;

(h) They use local resources—human and material—economically and save on transport costs;

(i) They create a middle class of self-employed entrepreneurs;

(j) They contribute to more equitable distribution of income and wealth.

The report identifies infrastructure and institutional factors, domestic financial resources and domestic and international subcontracting as key aspects in a package of support policies.

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*S. Nanjundan, "Small- and medium-enterprises: some basic development issues" (UNIDO/PC.137), published in slightly modified form in *Industry and Development* No. 20 (UNIDO publication, Sales No. E.86.II.B.7, 1987).

adverse impact of prices of oil and agricultural commodities.

Since oil production began from 1977 onwards, the Government has established a special account, the *Compte hors budget*, to absorb oil revenues and keep them out of the main operating budget, thereby minimizing oil-related distortions in other industries. The account provides a cushion against external financial shocks, enabling a steady course of balanced growth to be maintained between agriculture and industry.

However, much of the industrial growth is due to import-substitution industries enjoying protective measures and to State participation in industries such as aluminium products, cement, chemicals, pulp and paper mills. Many of the parastatal enterprises made losses totalling $8.8 million in the year to June 1985. To stop carrying the heavy load of loss-making parastatal enterprises, the Government holding company, *Société nationale d'investissements* (SNI), has announced a plan to sell to the private sector 62 companies across almost all manufacturing industries. The major companies include the *Société cellulose du Cameroun* (pulp and paper mill, 65-per-cent-owned by SNI), Alucam (aluminium smelter), Cameroon Sugar Company (sugar refining), Cameroon Plywood Corporation, Socame (fertilizer-chemicals), Solicam (textiles) etc.

Such rationalization is expected to make the loss-makers more efficient, profit-minded concerns, contributing to the achievement of growth targets of the sixth five-year development plan (1986-1991).

Over the next five-year period, an average GDP growth of 6.7 per cent is envisaged, a slightly lower target compared with the 7 per cent achieved during the just completed five-year plan period. The lower target would seem to indicate an admission of difficulties lying ahead, although some still regard it as too optimistic. Indeed, the world markets to which Cameroon exports oil, bananas, coffee, cotton, cocoa, timber etc. look uncertain, although high coffee prices in current markets have brought at least temporary relief to coffee growers. On the positive side, however, the following developments should be noted: the country's relatively low debt service ratio (about 8 per cent of export revenues), a current account surplus over the last five years, optimism regarding foreign resource inflows (its risk-rating is second only to Gabon in the region) and continued prudence in government macro-management (the budget was balanced in 1986). The new foreign investment code gives priority to processing of local raw materials, decentralization, small- and medium-sized enterprises and transfer of technology. The State, however, will continue to take a shareholding (though not a majority) in any large joint ventures, particularly in strategic industries.

In general, the prospects for the achievement of the targeted growth rate in Cameroon seem good, compared with other countries in the region.

3. Kenya

In Kenya, GDP grew by 5.3 per cent in 1986, a substantial recovery from the negative growth recorded in 1984 (−0.6 per cent), followed by 3.9 per cent in 1985. For the first time, the growth target set for the fifth five year plan (4.9 per cent annual average growth during the period 1984-1988) has been met. MVA grew in 1986 by 9.3 per cent, leading other sectors in the economy and exceeding the manufacturing sector target set at 6.5 per cent per year for the plan period. The major boost came from a windfall in coffee revenues, which jumped from $249 million in 1985 to an estimated $510 million in 1986 as a result of a collapse of the coffee harvest in Brazil. Low oil prices have been a further stimulus, Kenya being a major oil importer in the region. Timely relief was thus provided to an economy faced with increasing debt burdens (the debt service ratio rose steadily from 12.1 per cent in 1980 to 21.5 per cent in 1984) and the threat of growing budget deficits (expected to equal 4-5 per cent of GDP in 1989). The economy would appear ready to grow again by 5 to 6 per cent in 1987, but subject to uncertainties, such as fluctuating coffee prices.

The manufacturing sector was one of the major beneficiaries of the coffee windfall and low oil prices. Much of the modern manufacturing sector depends on imported input material. For example, the steel industry imports steel billets from Zimbabwe; the automobile industry imports completely knocked-down vehicle kits from France (Peugeot), Japan (Toyota, Honda, Daihatsu) and Sweden (Volvo). Greater availability of foreign exchange thus means an uninterrupted supply of inputs for the industrial sector, while foreign exchange shortages are often a major cause of the high rate of unutilized industrial capacity. Coffee income is estimated to boost domestic demand for manufactured goods, by over 5 per cent in the specific case of automobiles in 1986.

The sales potential of manufactured goods could have been higher, had it not been for the high rates of taxes. To take the example of automobiles again, the completely knocked-down vehicle kit, as well as local components used, are subject to 25 per cent duty plus 90 per cent sales tax on the showroom price when the assembled automobile is sold to the final buyers. Relatively high tariffs on raw materials imported in addition to limited internal competition would appear to make manufactured goods in general less competitive in external markets. The Government has reportedly undertaken studies to remedy the adverse consequences of the existing tax system.

The Government has also been looking into the issue of "Kenyanization", which has tended to discourage foreign direct investment* (an important source of past industrialization). Kenyanization requires a 51 per cent shareholding by Kenyan nationals or the Government in joint ventures with foreign investors. A compromise reached in recent years, however, allows any ratio of foreign equity ownership with a proviso of incentive benefits scaled according to Kenyan ownership. For instance, joint ventures with local ownership between 41 and 50 per cent will now qualify for a 60 per cent tariff reduction; those with local ownership between 30 and 40 per cent will gain a 40 per cent tariff reduction. Companies in which locals hold 51 per cent or more will enjoy full access

*Foreign direct investment also seems discouraged by high corporate income tax amounting to 45 per cent and by withholding tax of 15 per cent.

to the Preferential Trade Area for Eastern and Southern Africa (PTA).*

Notwithstanding the restrictions placed on foreign direct investment by the move towards Kenyanization, foreign investors have been invited to participate in export-oriented and domestic-resource based manufacturing (rather than import-substitution) activities. As an incentive, remittance of capital gains made when foreigners sell their Kenyan holdings will be fully allowed. This measure alters the past policy of permitting remittance only up to the value of their original investment (the rest is locked up in an account at the Central Bank for five years). The new strategy** towards export-orientation is supposed to help reverse declining exports of manufactured goods (by 2 per cent per year for the last several years) and increasing deficits in the trade balance.

On the whole, the prospects for achieving 5-6 per cent MVA growth in 1987 seem favourable, although it is doubtful whether high coffee prices will continue to sustain growth well into 1988.

4. Zimbabwe

With an MVA-GDP ratio of over 20 per cent (highest in the region),*** Zimbabwe is trying to stimulate further industrialization through a strategy of increased State intervention. Such an approach contrasts with the trends towards less State participation in several other countries through a programme of privatization and reduced subsidies and trade barriers. Zimbabwe's first five-year development plan (1986-1990) envisages an annual average growth rate of 5.1 per cent, with the Government contributing 4.5 billion Zimbabwean dollars ($Z) (or 63.5 per cent) of the total investment of $Z 7.1 billion ($US 4.5 billion) and private investors of $Z 2.6 billion. The manufacturing sector is projected to play a leading role, growing at 6.5 per cent, and exports of manufacturers at 8.2 per cent per annum, according to the five-year plan.

The economy has, however, been hampered during the last several years by familiar constraints: shortages of foreign exchange (as a result of falling prices for its major mineral exports); increasing debt burdens (a debt service ratio of over 20 per cent of export earnings and 5.4 per cent of GDP in 1984); mounting government deficits (over 10 per cent of GDP in 1985/1986); and loss-making State-owned enterprises. Severe foreign exchange constraints, coupled with a prolonged period of recession, occasioned negative growth in manufacturing output in the three consecutive years to the end of 1984, the most severe decline being −11.6 per cent in 1984. The brisk recovery in 1985 (growth of 7 per cent in GDP and 4.4 per cent in MVA) was supported by record harvests (with a 48 per cent jump in crop sales) and an increase by 30 per cent in government allocations of foreign exchange to the industrial sector.

Given the fragility of an economy based on commodity exports, the first five-year plan (1986-1990) was designed to diversify export potential into other foreign-exchange earners,* particularly manufactured exports to PTA member countries. For this purpose, the Government established the Zimbabwean Development Bank in March 1985 to mobilize internal and external funds; adopted an export-promotion strategy (subsidized loans, tax reliefs, overseas marketing services etc.) involving the close co-operation of over 400 companies with the Government; and decided to increase State participation so as to strengthen industrial linkages between parastatal enterprises themselves and between the parastatals and the private sector, a notable example being the role played by the Government in the Industrial Development Corporation and the Zimbabwe Iron and Steel Company to co-ordinate upstream and downstream industries.

These measures will certainly have a long-term impact, but the outcome will depend on whether increased State intervention will promote greater efficiency in the economy. In the short term, however, both GDP and MVA growth are expected to slow down from the 1985 peak well into 1988, especially since the low growth forecast for the world economy will mean a big loss in potential markets for Zimbabwean exports.

G. North Africa and Western Asia

In spite of a deteriorating external environment in 1986 marked by plunging oil prices, North Africa and Western Asia registered an improved economic performance with a GDP growth of 3.1 per cent,** up from −0.4 per cent in 1985, and an MVA growth of 8.1 per cent, compared with 6 per cent in 1985. A large part of this improvement was the result of government efforts to maintain growth momentum by resorting to deficit financing or drawing from foreign exchange reserves. The prospects for 1987 and 1988 would appear somewhat uncertain. Many oil-exporting countries experienced deteriorating balance-of-payment positions in both 1985 and 1986. However, cautious optimism can be permitted on oil prices; there is a chance that $16-$18 a barrel may be sustained in 1987.

North Africa and Western Asia have enjoyed relatively steady MVA growth since the beginning of the 1980s, unlike Latin America, Tropical Africa and even South-East Asia, where rapidly changing external conditions have led to considerable fluctuations in industrial output. The factors influencing the economic performance of the region have included: a

*PTA has 15 member countries: Burundi, Comoros, Djibouti, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Rwanda, Somalia, Swaziland, Uganda, United Republic of Tanzania, Zambia and Zimbabwe. The progressive liberalization of intra-PTA trade began in July 1984.

**The Government rules out measures popular in other export-oriented countries, such as tax holidays, accelerated depreciation, rebates on customs duties and subsidized loans.

***In Kenya it is 11 per cent, in Cameroon, 10 per cent, and in Nigeria, 5 per cent.

*The first batch included textiles, clothing, leather products, furniture, processed food and horticultural goods.

**The figure for GDP growth is a weighted average of countries in Western Asia (Bahrain, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic and Yemen) and North Africa (Algeria, Cyprus, Egypt, Libya, Morocco and Sudan). In 1986, most of the Gulf countries experienced a negative GDP growth in nominal terms: −8 per cent in the United Arab Emirates, −10 per cent in Saudi Arabia, −11 per cent in Kuwait, and −12 per cent in Qatar. The real GDP growth figures in the text are calculated in 1980 constant prices (including the oil price).

large build-up of foreign exchange earnings permitting the regular supply of imported capital goods and input materials to local industry; steady replacement of huge imports from outside the region by regional industrial output; joint ventures involving long-term contracts for the sale of output, such as petroleum-based downstream products, in the investors' countries; the virtual absence of infrastructure bottlenecks; and small industrial bases. All these factors contributed to the achievement of steady growth.

It seems reasonable to expect a similar pace of MVA growth for 1987 and 1988, or 8.6 per cent and 9.1 per cent respectively. An industry breakdown of this growth is shown in figure X. Although steady expansion is observable in virtually all industries, petrochemicals and industrial chemicals, iron and steel and machinery (electrical and non-electrical) will continue to be the leading industries in the region. At the same time, there is widespread concern over increasing protectionism in EEC and United States markets against petrochemicals and energy-intensive industrial products made in the region.

1. Saudi Arabia

The major oil producer in the region has been beset by recession since 1983, with consecutive years of negative growth up to 1986. This trend is expected to be broken in 1987 thanks to improved prospects for oil prices and deficit financing to boost the economy, as proposed in the 1987 budget. Total government expenditure is set at 170 billion Saudi Arabian riyals (SRIs) ($45 billion), 20 per cent more than estimated actual spending in the 1985-1986 fiscal year. The envisaged deficit of SRIs 53 billion (the largest ever) will be covered from reserves (estimated at $90 billion, half in liquid and the rest in long-term investment assets).

Against this background, manufacturing output is expected to continue growing in 1987 and 1988 by 7.1 per cent and 7.3 per cent respectively, an improvement over 6.4 per cent and 6.7 per cent recorded in 1985 and 1986. The improved growth is in part due to the coming on stream of a series of new products in the last couple of years and the completion of projects in petrochemicals and energy-intensive industries after 10 years of investment in industrial facilities, such as the Jubail and Yanbu industrial cities. During 1985, four petrochemical companies affiliated with the Saudi Basic Industries Corporation (SABIC), a leading actor in the industrialization of Saudi Arabia, began production: the Arabian Petrochemical Co., the Eastern Petrochemical Co., the Saudi Petrochemical Co. and the Saudi Yanbu Petrochemical Co. During 1986, the National Plastics Co. came on stream with the production of 300,000 tonnes of vinyl chloride monomer and 200,000 tonnes of polyvinyl chloride. Table 23 shows total sales of SABIC in 1985, broken down by product categories.*

According to the *SABIC Annual Report 1985*, the corporation's five-year plan coincides with the fourth five-year development plan (1985-1990) of the country,

*It has been reported that SABIC made a 328 per cent increase of profits in 1985 over the previous year, amounting to SRIs 148 million ($US 39 million).

Table 23. Sales by Saudi Basic Industries Corporation, 1985

Product	*Sales (tonnes)*
Reinforcing rods and bars	1 149 000
Methanol	1 285 000
Urea	896 000
Ethylene	60 000
Ethylene glycol	223 000
LLDPE	329 000
HDPE	155 000
Ethylene dichloride	162 000
Styrene	149 000
Ethanol (industrial)	188 000
Caustic soda	114 000
Sulfuric acid	82 000
Melamine	5 000
Nitrogen	95 000
Oxygen	68 000

Source: SABIC Annual Report 1985.

which envisages a 15.9 per cent annual growth in the industrial sector. During this period, SABIC plans to invest further in joint venture projects including petrochemicals, metals, plastics, fertilizers and other related products, with total investment figures of SRIs 16.4 billion ($4.4 billion). These plants are scheduled to come on stream in the next two years.

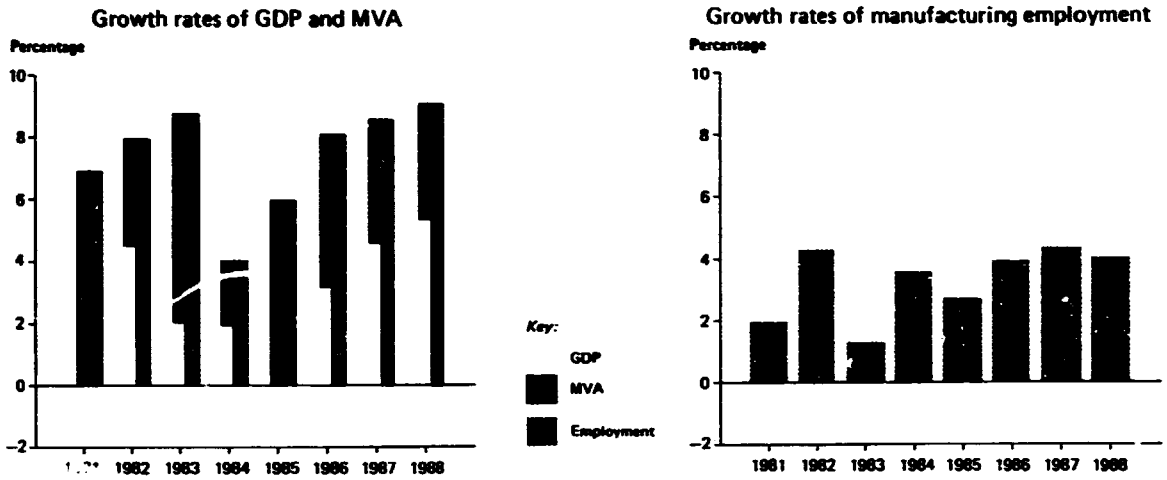
The activities of SABIC illustrate the country's efforts to transform the oil-dependent economy into a diversified industrial economy. There are about 2,000 industrial enterprises, representing total investment of approximately SRIs 60 billion ($16 billion). Industrial expansion is expected to continue, particularly since local output accounts for only 15 per cent of the manufactured goods consumed, the rest being imported. For some industrial output, however, domestic market demand has already been met and the future market lies abroad. For instance, the Saudi Arabian Fertilizer Company produced a record output of over 326,000 tonnes in 1986, and of this output, only 89,000 tonnes were sold on the domestic market, the rest being marketed in Asia, for example in China and Pakistan.*

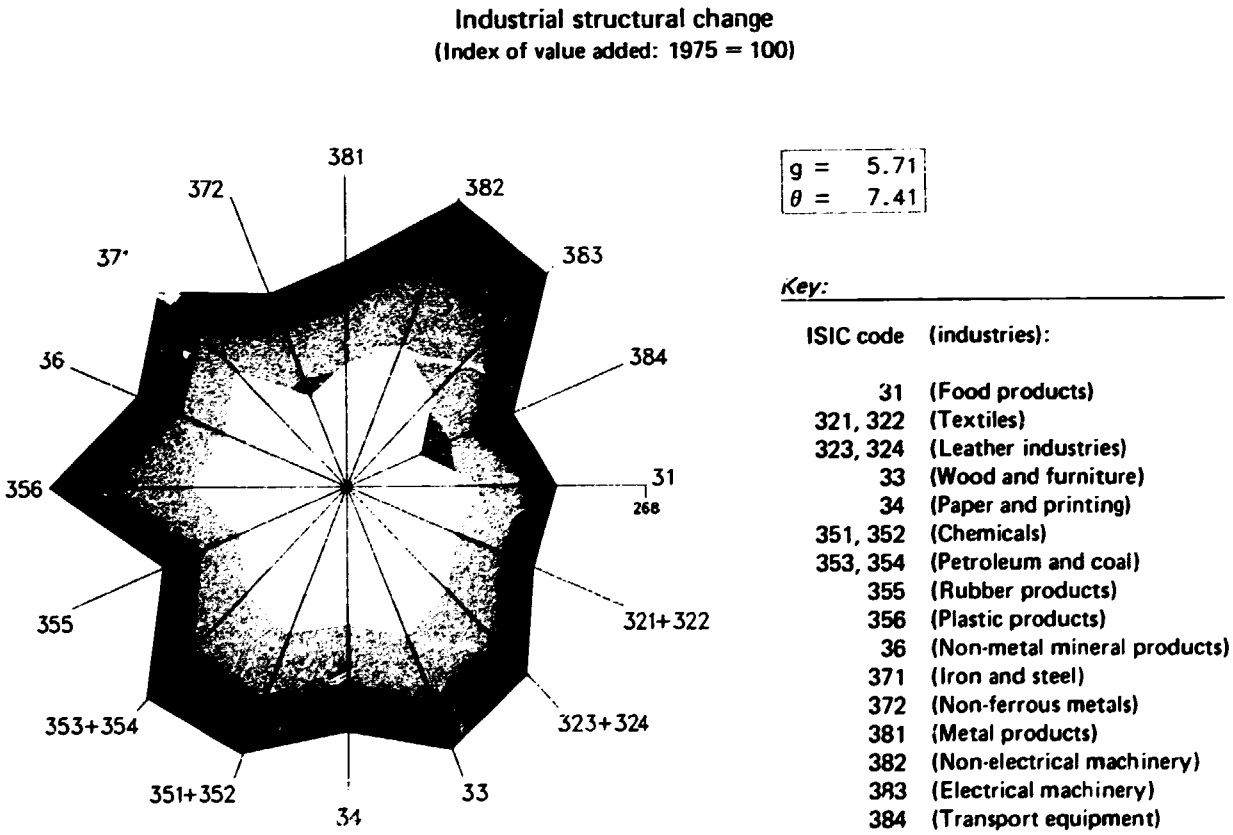
Concern has been expressed, however, over the increasing tendency of protectionism against Saudi Arabian exports in some overseas markets. For instance, the European Commission decided in 1986 to impose tariffs on the majority of petrochemical exports into the EEC region, since Saudi Arabia's quotas under the generalized system of preferences were easily exceeded. Some EEC tariffs range from 12 to 13 per cent against Saudi Arabian petrochemicals, including methanol and low-density and high-density

*In order to mitigate the problems of overcapacity and export pressure, the Government of Saudi Arabia is reportedly resorting to a licensing system for new industrial projects. The following table provides a breakdown of new industrial licenses issued during the first five months of 1986.

Industry	*Number of projects*	*Capital (millions of Saudi Arabian riyals)*
Food processing	22	281.8
Textiles and leather	6	66.4
Wood and furniture	6	83.8
Paper and pulp	3	25.3
Chemicals	20	403.5
Building materials and ceramics	7	75.1
Metal manufactures	16	174.4
Other	4	1 180.3

Figure X. Growth rates of GDP, MVA and manufacturing employment 1981-1988, and industrial structural change, 1975-1988: North Africa and Western Asia





Constant prices of 1980

g = Average annual growth rate, 1970–1988 (percentage)

θ = Index of structural change, 1970–1988

Sources: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

polyethylene. In contrast, most EEC exports enter the Saudi Arabian market at a tariff rate of 7 per cent or less. The United States also began anti-dumping proceedings against Saudi Arabian carbon steel wire rod. Considering the strong comparative advantage that Saudi Arabia enjoys in petrochemicals and energy-intensive industries, a great challenge would appear to lie ahead for co-operation and industrial restructuring between the Gulf countries and major developed countries.*

2. *Turkey*

The growth of the economy, based on exports of labour-intensive manufactured goods (textiles, clothing, processed food etc.), is expected to slow down in 1987.** The growth rate of GDP rose from 3.3 per cent in 1984, to 5.9 per cent in 1985, to a height of 7.9 per cent in 1986. The growth of MVA led GDP, registering 10.5 per cent, 5 per cent and 9.5 per cent respectively for the three years. GDP growth is expected to slow down to 5.8 per cent and 5.4 per cent in 1987 and 1988 respectively, and MVA to 7.8 per cent and 7.2 per cent. The oil price fall in 1986 has accounted for much of the decline in Turkey's exports to oil-producing countries of the region.

During the first 10 months of 1986, the country's oil import bill fell by $1.3 billion (or 47 per cent). But the savings on oil were offset by an 8.5 per cent decline in overall exports to $5.9 billion, led by a 26 per cent plunge to $1.8 billion of Turkey's exports to North Africa and Western Asia. Exports to Iraq and the Islamic Republic of Iran, two major trade partners of Turkey in the region, dropped by 48 per cent and 41 per cent, respectively, as a result of the Gulf war and the financial drain that it caused. Turkey's exports to EEC countries also fell in 1986 by 3 per cent.***

Declining export growth would appear most severe in manufacturing products, compared with agricultural and mining products. In 1984, manufacturing exports had already surged by 40.6 per cent, but fell to a growth rate of 16.5 per cent in 1985 (see table 24). Much of this export growth was supported by a greater utilization of excess capacity in the manufacturing sector (see table 25) and export incentives, particularly direct subsidies that ran as high as 24 per cent of total export values in 1983 and 18 per cent in 1984. The incentive measures are, however, to decline to 6-8 per cent by the end of the fifth five-year plan period (1985-1989).

Countering the export slowdown, domestic demand, largely supported by government deficit financing, appears to have sustained the growth of manufacturing output in 1986. Manufacturing output as a whole is reported to have grown by 14.8 per cent in the first half of 1986, comparable to the rate observed in 1985. But some industries have performed considerably better than others: polyethelene grew by 272 per cent, blistered copper by 53.9 per cent, alumina by 47.9 per cent, crude iron by 32.7 per cent, automobiles by 32 per cent and steel ingot by 31.7 per cent. Negative growth industries included filtered cigarettes (−40 per cent), kraft paper (−32.4 per cent) and petroleum-based products such as gasoline, motor oil and nitrogen fertilizers (−9.1 per cent). The private manufacturing sector expanded output by 13.7 per cent during the

Table 24. Exports and imports: Turkey, 1984 and 1985

Item	1984 (millions of dollars)	1985 (millions of dollars)	Percentage change over previous year 1984	1985
Exports (f.o.b.)				
Agriculture	1 749	1 719	−7.0	−1.7
Mining and quarrying	240	244	26.9	1.7
Manufacturing	5 145	5 995	40.6	16.5
Total	7 134	7 958	24.5	11.6
Volume			23.1	10.0
Average value			1.2	1.5
Imports (c.i.f.)				
Oil	3 637	3 612	−0.8	−0.7
Industrial products	6 432	7 052	22.9	9.6
Other	688	949	103.8	37.9
Total	10 757	11 613	16.5	8.0
Volume			17.2	6.5
Average value			0.6	1.4
			Percentage distribution	
Exports (f.o.b.)			100.0	100.0
Agriculture			24.5	21.6
Mining and quarrying			3.4	3.1
Manufacturing			72.1	75.3
Imports (c.i.f.)			100.0	100.0
Oil			33.8	31.1
Industrial products			59.8	60.7
Other			6.4	8.2

Source: State Institute of Statistics, Turkey.

Table 25. Capacity utilization in private industry: Turkey, 1979-1984

(Percentages)

Industry	1979	1980	1981	1982	1983	1984[a]
Food, beverages and tobacco	57.5	55.0	63.8	74.0	75.3	74.2
Textiles and leather	44.8	58.2	68.5	70.2	75.3	77.4
Forestry products	45.7	52.2	52.1	57.7	58.7	54.3
Pulp and paper	50.4	50.1	77.6	71.8	73.0	77.1
Chemicals, rubber and plastics	40.9	49.9	57.5	69.8	72.9	75.8
Ceramics and related products	56.0	63.4	66.5	69.5	72.0	77.7
Metallurgy	40.0	41.6	59.3	63.6	65.3	70.6
Consumer durables, machinery and equipment	46.1	51.5	47.6	59.7	62.2	68.0
Other	43.7	47.5	59.5	71.8	71.9	73.1
Total	45.0	51.5	62.1	66.8	69.6	72.7

Source: Istanbul Chamber of Industry.

[a]First quarter.

*The Japanese are reportedly cutting back domestic production in preparation for increased imports of Saudi Arabian petrochemicals. A number of leading Japanese producers are participants in SABIC ventures.

**Compared with other countries of the region, Turkey has a relatively large and diversified manufacturing sector, accounting for about one fourth of GDP.

***The EEC share in Turkey's total exports amounts to about 40 per cent and that of North Africa and Western Asia to 43 per cent, according to 1985 figures.

first nine months of 1986, while the public manufacturing sector, accounting for about 40 per cent of total manufactures in Turkey, grew by 4.5 per cent. The public sector accounts for approximately 40 per cent of total manufacturing output in the country.

Imports surged ahead, particularly in investment goods, which grew by 68 per cent during the first half of 1986 compared with the same period the previous year, in addition to a 28 per cent increase in imported consumer goods. High on the list of imports were boilers, machinery and mechanical equipment, electrical machines, electronics equipment and tractors, mostly for government use in big infrastructure projects. External borrowing financed the difference between declining exports and increasing imports. In 1986, short-term debt rose by 42.5 per cent to $9.4 billion.

The growing foreign exchange constraints and the Government's cautious approach to adopting the necessary adjustment policy appear likely to dampen the growth of the manufacturing sector. Continued trade deficits (up to $3 billion annually) and the rise in short-term borrowing raised the debt service ratio to about 44 per cent, compared with 32 per cent in 1985. To reverse this adverse trend, the Government has somewhat reduced the speed of import liberalization (which started in 1980). In October 1986, the down payment required for imports was raised by one percentage point for industry and 3 percentage points for exporters (resulting in 5 per cent and 7 per cent respectively for the two groups). This measure will tend to dampen imports of raw materials and hence growth of the industrial sector. Export subsidies are also to be gradually phased out. Expenditure cuts by 15 to 20 per cent were announced for the second half of 1986. Finally, the banks' reserve requirements against deposits were raised to help limit the growth of money supply.

In short, maintaining the growth momentum would depend upon the growth prospects of the oil-producing countries in the region and the availability of external loans in the immediate future. The growth impulse is not likely to be provided by the EEC countries' demand for Turkish goods, considering the prospects for weak growth in the EEC region. The low rate of capacity utilization in Turkish manufacturing (currently about 62-65 per cent on average) would seem to preclude the possibility of domestic investment stimulating growth.

H. Indian Subcontinent

Although the Indian Subcontinent, unlike other developing regions, has remained largely unscathed by the business and financial fluctuations of the world economy, its GDP growth rate has been slowly declining since 1983. In 1986 it had a GDP growth of 5.2 per cent, a slight decline from 4.7 per cent in 1985. The prospect is for a further decline, to 4 per cent and 4.7 per cent in 1987 and 1988 respectively. In contrast, its MVA growth exceeded that of GDP, recording a rate of 7.6 per cent in 1986. But MVA growth is also expected to slow down somewhat, to 4.9 per cent and 5.3 per cent in 1987 and 1988 respectively (see table 26 for country breakdown).

Table 26. Growth rates of GDP and MVA: selected countries in the Indian Subcontinent, 1983-1988

(Percentages)

Country or area	1983	1984	1985	1986	1987	1988
Indian Subcontinent						
GDP	6.8	4.5	4.7	5.2	4.0	4.7
MVA	5.4	5.9	6.5	7.6	4.9	5.3
Bangladesh						
GDP	4.2	3.1	4.1	5.2	4.5	3.6
MVA	3.7	3.7	2.0	−4.0	8.5	7.3
Burma						
GDP	4.8	6.7	6.2	3.5	4.2	4.2
MVA	−6.1	10.5	4.9	3.3	3.1	3.8
India						
GDP	7.7	4.0	4.0	5.0	3.8	4.8
MVA	5.0	5.2	6.6	8.3	4.6	5.0
Nepal						
GDP	3.6	3.6	3.0	4.2	2.3	2.8
MVA	7.5	10.3	7.7	7.4	7.9	7.8
Pakistan						
GDP	4.4	8.2	8.8	7.5	5.1	5.0
MVA	10.2	8.6	9.0	8.2	6.2	6.9
Sri Lanka						
GDP	4.8	5.0	5.0	4.0	5.1	5.3
MVA	−3.0	11.4	−3.0	6.1	0.4	3.8

Source: Estimates and forecasts by UNIDO/SR/GLO.

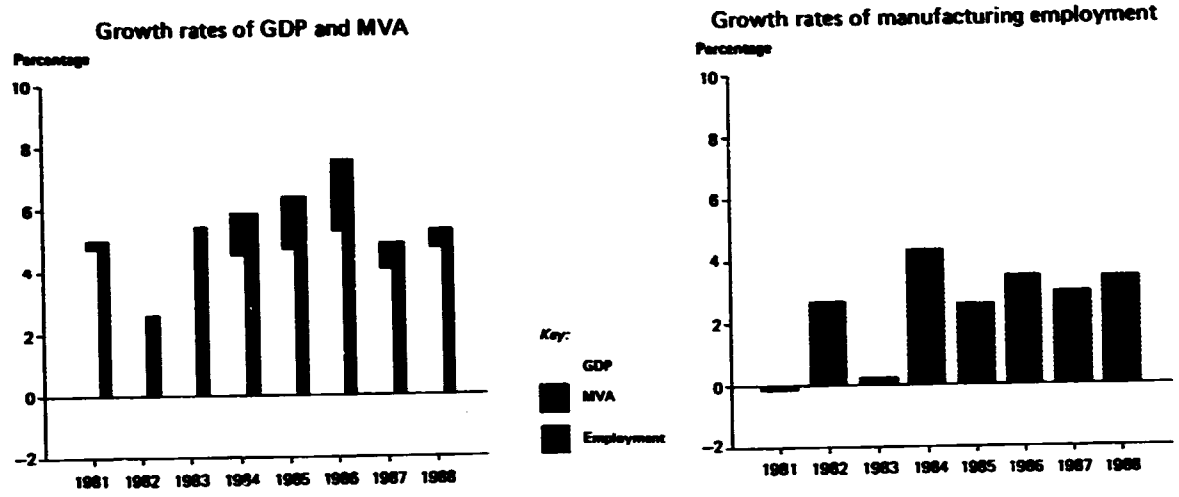
An industry breakdown of regional MVA growth shows the leading industries to include industrial chemicals, petroleum refining, plastic products, nonferrous metals and electrical machinery. The rapid growth of these industries broadly conforms to the structural changes in industry that went on in the past (see figure XI). The virtual standstill (no growth) in textiles and leather products is noteworthy.

The region's industry has been benefiting by low oil prices and expatriates' remittances from North Africa and Western Asia. It appears, however, that these sources of industrial expansion dwindled by the end of 1986. The prospects for the region's agricultural exports, such as tea, jute and rubber, do not seem inspiring for the immediate future. The prices of these commodities have been drifting downward, with no sign of a recovery. To counteract the industrial stagnation, Governments in the region have adopted more or less similar sets of policy measures and strategies, including: encouragement of joint ventures with foreign investment; some limited trade liberalization; and selective business deregulations coupled with an effort to sell partly State-owned industrial enterprises to the private sector.

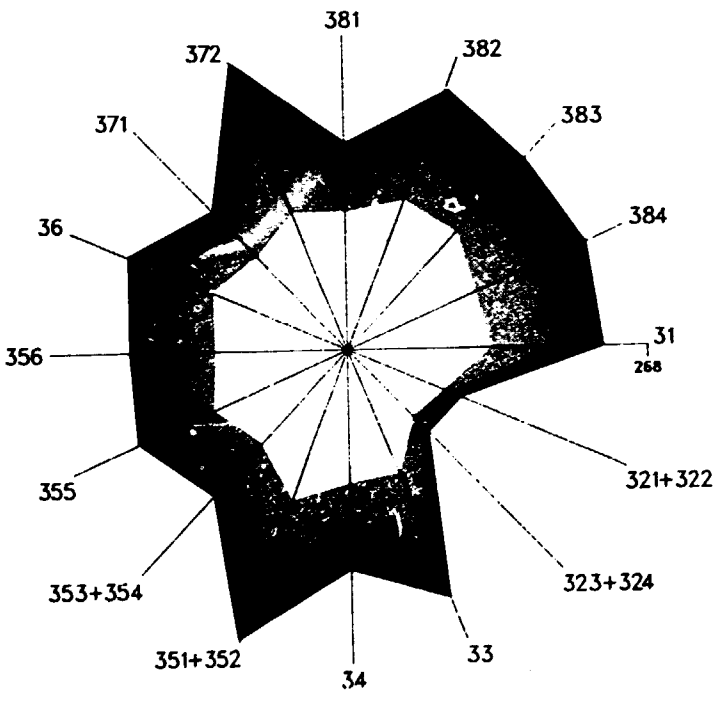
1. India

In India, which, with three quarters of the region's GDP and MVA, is the dominant economic power, the Ministries of Industry and Commerce announced in 1986 a series of new measures relaxing industrial licensing procedures. Under the new measures, 28 industries were delicensed out of 32 broad industry categories for licensing purposes, covering about 70 per cent of manufacturing output. This measure enables the private companies to invest and compete in industries

Figure XI. Growth rates of GDP, MVA and manufacturing employment, 1981-1988, and industrial structural change, 1975-1988: Indian Subcontinent



Industrial structural change
(Index of value added: 1975 = 100)



g = 4.28
θ = 21.45

Key:

ISIC code	(industries):
31	(Food products)
321, 322	(Textiles)
323, 324	(Leather industries)
33	(Wood and furniture)
34	(Paper and printing)
351, 352	(Chemicals)
353, 354	(Petroleum and coal)
355	(Rubber products)
356	(Plastic products)
36	(Non-metal mineral products)
371	(Iron and steel)
372	(Non-ferrous metals)
381	(Metal products)
382	(Non-electrical machinery)
383	(Electrical machinery)
384	(Transport equipment)

Constant prices of 1980

g = Average annual growth rate, 1970–1988 (percentage)

θ = Index of structural change, 1970–1988

1985–1988 forecast
1980–1985
1975–1980

Sources: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

reserved earlier for the public sector,* especially telecommunications equipment and large computers.

The resulting competition is expected to bring about greater efficiency in overstaffed public enterprises and to reduce the Government's obligation to cover enterprise losses by subsidies. The public sector industries in India reportedly made an overall loss of 2 billion Indian rupees (Rs) ($160 million) in the 1984-1985 period. In 1986 the Government established the Board of Industrial and Financial Reconstruction to study and recommend measures to streamline the chronic loss-makers, such as the National Textile Corporation, with an accumulated loss of Rs 7.2 billion. The fiscal necessity to economize on spending would seem in part to have prompted a shift in the Indian policy of industrial competition. Interest payments on government debt is estimated to require 45 per cent of the central government's revenues during the seventh five-year plan period (1985-1990).

Foreign investors are also invited through joint ventures to compete in the domestic market in selected areas, particularly in machinery, electronics (especially large-scale computer systems) and chemicals. The implicit aim is to import foreign technology, thereby reducing costs and updating outmoded products. However, foreign equity ownership is limited to 40 per cent, except in cases involving the most advanced technology, subject to government approval. In 1985, the Government approved 1,024 foreign joint ventures, compared with 752 in 1984.

A noteworthy development in the high technology area is the birth of domestic enterprises, for example TCS and Tata Burroughs, specializing in electronics software production, supported by a new provision of incentives. India exported in 1986 Rs 300 million ($23 million) worth of software and is expected to reach the Rs 5 billion level by 1990. Under the new incentive measures, software producers are allowed to spend as much foreign exchange as they need to import necessary equipment and develop an overseas marketing network. The new policy, however, requires the producers to earn, according to an agreed time schedule, foreign exchange equivalent to some multiple of the original expenditures, for instance, 150 per cent if financed by the producer's own fund, 250 per cent for funds borrowed from the Government, and 350 per cent for export-import bank credit. The Indian advantage in software production lies in its large pool of technical manpower (nearly 2.5 million) and the educational system (each year turning out over 10,000 highly qualified technical graduates willing to work at a fraction of the wage rates prevailing in developed market economies). Foreign investors seem to have a keen interest in tapping their potential through joint ventures.

These efficiency-oriented measures and a new dose of competition will ultimately help to rejuvenate some private industries. But bureaucratic controls seem still to remain a problem in State-owned industries. The question is how soon the effects of increased efficiency would seep through the whole industrial system to generate sustained industrial growth and to counteract the adverse economic effects of budget and trade deficits, which grew by over 50 per cent in 1986.

*The Government owns about two thirds of India's total fixed capital and accounts for 27 per cent of industrial output.

2. Pakistan

Pakistan, the second biggest economy in the region (with 14 per cent of its GDP), performed rather well in 1985 and 1986, when GDP grew at 8.8 per cent and 7.5 per cent respectively. MVA grew at an even higher rate of 9 per cent and 8.2 per cent. Among the main factors boosting the economy were the remittances from expatriate workers in the Gulf countries and United States aid, which rose with the escalation of conflict in Afghanistan. It is doubtful whether these resources will continue to flow in the same magnitude in the immediate future. Some slow-down is therefore envisaged in both GDP and MVA growth in 1987 and 1988, although still exceeding the growth rates in other economies of the region.

The Government of Pakistan, like that of India, is encouraging a greater role by the private sector than in the past. During the 1985-1986 period, public sector investment ceased to grow, except for innovating State-owned manufacturing enterprises. The share of the private sector in total fixed capital formation increased to 70 per cent in 1985 compared with 26 per cent less than a decade earlier. However, total national fixed capital formation failed to increase as greater private investment only barely matched the fall in public investment. To inspire private investment in industry, the Government decided to provide 70 per cent of the funds.

The Government also announced in June 1985 a plan to sell 12 State-owned manufacturing units to the highest bidders. But the manufacturing units (major loss-makers) constitute only one component of a bigger divestment scheme including the planned sale of Pakistan International Airlines. Such sales are forecast to bring in 2 billion Pakistan rupees, according to the budget made public for the fiscal year ending in June 1987.

3. Bangladesh

In Bangladesh, the third largest economy in the region, industrial expansion has fallen below expectations. In the fiscal year 1986-1987 it grew only about 1 per cent. The performance of the main foreign exchange earner, jute, was disappointing and the outlook is bleak. At the same time Bangladesh is facing a rising unemployment problem especially in rural areas. The Government has assigned a high priority to industry in order to diversify sources of export earnings and to expand employment opportunities outside the agricultural sector. Policy lays stress on the mobilization and participation of the private sector to expand manufacturing activity and raise industrial efficiency. Bangladesh has developed a strong comparative advantage in garments (the United States recently imposed quotas under the MFA on imports from Bangladesh). It also has good prospects for developing export competitiveness in other resource-based as well as non-resource based industries.

At a forum jointly sponsored by the Government, UNDP and UNIDO in January 1987, over 70 memoranda of understanding were signed with foreign investors interested in establishing joint venture industries. The prospective sum of investment amounted to about $300 million, which, if realized, could provide a

momentum for rapid growth of the fledgling industrial sector. Some of the project items covered by the memoranda are listed below:

Project	Prospective investment (millions of dollars)
Soda ash plant	70.8
Paper mill	25
Polyvinyl chloride resin	13.4
Aluminium foil	12.2
Refining used oil	6
Canned fruit	5.2
Leather finishing	4
Wooden pencils	1
Sheet glass	...
Diamond cutting	...

These examples of policy shifts illustrate the serious intention of the region to industrialize by expanding various linkages (trade, finance, technology) with the world industrial economy. The long-term prospect appears encouraging, considering the availability of human and material resources in the region and the progress being made in formulating policy. However, in the immediate future (1987-1988), the stagnant world economy should not be expected to provide any unusual external boost to industry in the region.

I. South-East Asia

For the region as a whole, a GDP growth rate of 5.9 per cent was achieved in 1986, a substantial recovery from the 2.1 per cent recorded in 1985. The outlook is for a slight improvement in 1987 and 1988, with 5.9 per cent and 5.2 per cent growth respectively, still about half of the growth pace of the 1970s. The manufacturing sector recovered in 1986 after a dismal growth rate of 1.6 per cent in 1985. In 1986, the growth rate of MVA (10 per cent) was almost double that of GDP. Growth in the manufacturing sector in 1987 and 1988 is expected to continue to exceed that of GDP, reaching 9.1 per cent and 8.6 per cent respectively.

The growth-leading manufacturing industries with expected double-digit rates include iron and steel, non-ferrous metals, electrical machinery, leather products and footwear. The products of these industries are major export items of the region and have led other industries during the last decade (see figure XII).

Much of the high MVA growth in the region reflects the fortunate cases of Hong Kong, the Republic of Korea and Taiwan Province, with 11.5 per cent, 16.8 per cent and 9.6 per cent of MVA growth respectively in 1986 (see table 27). These economies seem to have benefited most, compared with other economies of the region, from brisk export demand combined with the low oil price, the low dollar and low interest rates. The export demand for manufactured goods has been the most important stimulus to the growth of these economies. Their export-oriented growth strategy for industrialization has paid a handsome dividend, partly capitalizing on the somewhat reduced Japanese exports to the world market, particularly to the United States, owing to the yen-dollar revaluation.

In contrast, ASEAN member countries have not fared as well as their northern neighbours for various reasons, such as the deteriorating price of primary products (including oil), the increasing burden of debt servicing and the uncertain business climate.

Table 27. Growth rates of GDP and MVA: selected countries and areas in South-East Asia, 1983-1988

(Percentages)

Country or area	1983	1984	1985	1986	1987	1988
South-East Asia						
GDP	5.9	6.1	2.1	5.9	5.9	5.2
MVA	8.1	9.8	1.6	9.6	9.1	8.6
Hong Kong						
GDP	6.5	9.4	0.8	9.0	6.5	3.8
MVA	14.8	7.1	-4.6	11.5	2.1	1.7
Indonesia						
GDP	4.2	5.8	1.9	1.9	3.3	1.7
MVA	2.2	12.8	10.6	6.2	7.4	5.1
Malaysia						
GDP	6.3	7.6	-1.0	0.8	3.5	4.8
MVA	8.2	11.6	-5.4	-1.7	1.1	3.6
Philippines						
GDP	1.1	-4.6	-3.8	0.2	2.2	3.7
MVA	2.3	-7.1	-5.5	-0.8	1.7	3.4
Republic of Korea						
GDP	9.5	7.9	5.2	12.0	9.3	8.7
MVA	10.9	14.6	4.3	16.8	14.6	13.8
Singapore						
GDP	7.9	8.2	-1.8	1.9	3.3	2.5
MVA	2.3	9.5	-7.4	-1.6	-1.0	-2.2
Taiwan Province						
GDP	7.7	9.6	4.1	10.8	10.4	9.4
MVA	10.4	13.1	1.2	12.5	12.7	11.1
Thailand						
GDP	5.8	6.0	4.0	3.8	3.8	3.0
MVA	7.3	6.5	5.6	5.3	5.3	4.4

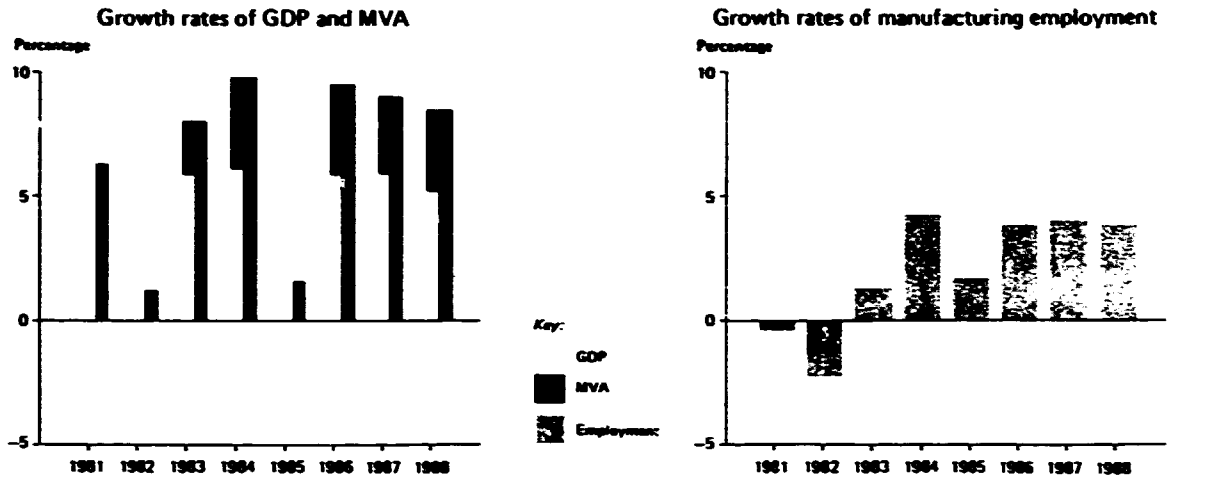
Source: Estimates and forecasts by UNIDO/SR/GLO.

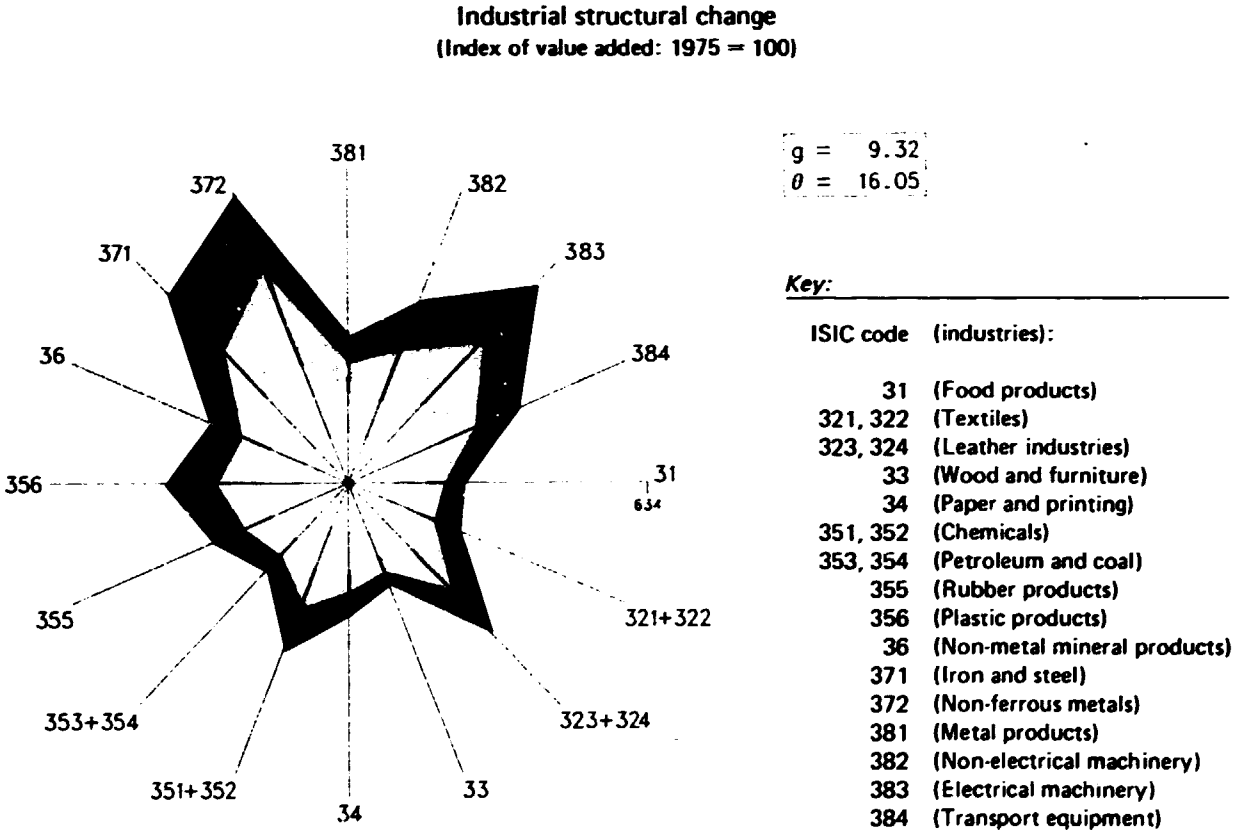
1. Indonesia

Indonesia, the largest economy of ASEAN, has been hit by the falling price of oil in the world market. Oil and gas formerly accounted for 70 per cent of its export income. Other non-oil export items such as rubber and coconut products have also suffered price falls. As a result, GDP grew by only 1.9 per cent in 1986. In spite of the deteriorating external economic conditions, however, the manufacturing sector managed to sustain its growth, with rates of 10.6 per cent in 1985 and 6.2 per cent in 1986. This performance was due partly to the policy of import substitution behind high protective barriers, and has been accompanied by inefficiency in resource allocation.

The industrial reform package announced in January 1987 represents a *de facto* admission of such inefficiency. It provides for tariff reduction, trade deregulation in the textiles and steel industries and new directives on the use of excess industrial capacity. Textile manufacturers can now import fibres needed for production directly instead of through State-owned importing enterprises. Import quotas on 135 varieties of textile fibres have been eliminated. Likewise, quotas have been removed on seven different varieties of steel imports. There have been reductions in import duties on stamping foils, radiators, refrigerators, aluminium products, micro-generators, household equipment, wires, tubes, pipes, copper alloys, fishing vessels etc. The requirement of production licences has also been removed for many product lines, enabling industrial-

Figure XII. Growth rates of GDP, MVA and manufacturing employment, 1981-1988, and industrial structural change, 1975-1988: South-East Asia





Constant prices of 1980

g = Average annual growth rate, 1970–1988 (percentage)

θ = Index of structural change, 1970–1988

Sources: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

ists to diversify and increase the use of otherwise idle capacity.

In the new budget for 1987-1988, the Government also plans to cut subsidies and development funds, owing partly to the growing debt service burden. Debt service payments are expected to soar by 62 per cent in the fiscal period, amounting to 30 per cent of the total budget.* The main victim appears to be the manufacturing sector, with a decline of over 53 per cent in planned development expenditures.

It is difficult to gauge how deeply these diverse shock measures will stimulate manufacturing output in the short term, although the long-term effect could help to enhance industrial efficiency.

2. *Malaysia*

Malaysia, another major primary products exporter of the region, suffered negative growth of GDP (−1 per cent) and MVA (−5.4 per cent) in 1985—the first contraction in a decade. The growth performance improved slightly in 1986 with 0.8 per cent for GDP but MVA declined by 1.7 per cent. Steady but slow progress is forecast for 1987 and 1988, with 3.5 per cent and 4.8 per cent GDP growth respectively. MVA growth will be trailing behind GDP growth at 1.1 per cent and 3.6 per cent in 1987 and 1988.

Continuing slides in commodity prices for rubber, oil, palm-oil and tin (major exports of Malaysia) since 1980 caused the terms of trade to plunge by 5.6 per cent and 15.5 per cent in 1985 and 1986. Malaysia's commodity-based exports, which account for more than 50 per cent of GNP, also fell by 5.1 per cent and 14.7 per cent in those two years. This has led to contractions in almost all branches of the economy, with capital investment falling by 33.2 per cent and the rate of savings in the private sector by 22 per cent in 1985.

The recovery in 1986 from a contraction of GNP in the previous year was assisted by a strong rebound in overseas demand for manufactured goods, particularly electronics and processed agricultural goods. Such demand reportedly grew by over 10 per cent, whereas demand for several manufactured goods destined for local markets declined substantially, with iron and steel down by 10.6 per cent and non-metallic minerals by 9.1 per cent. The latter would seem to reflect the downturn experienced by domestic users of these products as inputs, for example automobile makers (12 altogether), with an annual production capacity of 180,000 vehicles, while the market size was reported to be 110,000 in 1983.

The current episode symbolizes the weakness of the economic structure—the smallness of the domestic market for import substitutes and the dominance of a few commodity exports in GDP composition. To correct this situation and diversify and upgrade the industrial structure, the Government plans to steer investment into resource-based priority industries, including cement products, fabricated metals, plastics, flat-steel products, basic machinery components and electronics and electrical products for consumers and industry. The Government is said to be reviewing the existing incentive system to determine the reforms needed to change it from an import-substitution oriented to an export-oriented incentive system. Foreign direct investment figures prominently as one of the instruments to be used to achieve this end.

There are a number of short-term obstacles to the desired shift in the industrial structure, including the following: a shortage of skilled labour (technicians and engineers); competition from Thailand and Indonesia, where average wages amount to one third of those in Malaysia; and above all the Government's austerity programme, which recently cut development expenditure by 25 per cent with no immediate prospect of repairing this loss.

3. *The Philippines*

The Philippines experienced a GDP growth of 0.2 per cent in 1986, recovering from declines of −4.6 per cent and −3.8 per cent in 1984 and 1985 respectively. A progressive growth of 2.2 and 3.7 per cent is expected in 1987 and 1988. However, the expected growth will not be sufficient to recover lost ground. For over a decade the manufacturing sector in the Philippines, unlike the case of other rapidly growing developing countries, has seldom been the motor of growth. MVA growth is expected to grow at 1.7 per cent and 3.4 per cent in 1987 and 1988 respectively.

Though the general climate has improved in a number of ways, as reflected in the approval of the new constitution and lower interest rates, no means has yet been found to make the economy grow faster. Consumer demand has been weakened during the last few years as a result of strikes, high unemployment and low wage levels. A high level of unutilized production capacity, currently at 40 to 60 per cent in manufacturing, discourages new investment by entrepreneurs. Government pump-priming expenditures, such as the planned provision of $190 million in 1987 to create 1 million new jobs in rural areas, amount to only 0.01 per cent of GDP. The performance of export industries improved in 1986, with exports increasing by 22 per cent and imports by 18 per cent to create a surplus of $17 million. But a large part of the improvement was due to the fortuitous rise in the price of copra, a major export item, from 1.50 to 5 Philippine pesos per kilogram. Though the income of the copra producer will benefit the consumer goods industries, it is uncertain whether the high price of copra will be sustained on the world market.

The new industrial development strategy may prove to be of more long-term benefit to the economy. The Government has launched a new programme involving the following elements: emphasis on small- and medium-sized rural industries to strengthen the agricultural sector, which occupies over 70 per cent of the population of 58 million; emphasis on private initiatives rather than government support and protection; labour-intensive light manufactured goods rather than capital-intensive goods; urban-oriented industries; and gradual elimination of export taxes and protection for import-substitution industries. The latter measure is expected to remove a major cause of rent-seeking activities and inefficiency, since many infant industries

*The worsening of the debt burden is largely due to the fact that about 60 per cent of external debt ($33 billion) is denominated in the yen and in European currencies that have appreciated sharply against the United States dollar.

continued to receive protection over the past 20 years while turning out non-competitive products. Board of Investment criteria for granting incentives have also been revised to take into account industry efficiency rather than existing production capacity, which favours large enterprises.

The Government has also undertaken privatization programmes designed to improve industrial efficiency. The State-owned enterprises have long been a source of government deficits, since their losses have been covered by subsidies. The Government has started a five-year programme to sell to the private sector 285 State-owned companies with a combined book value of 650 billion Philippine pesos ($31.9 billion). Foreign investors are invited to make use of this opportunity and convert external debt of the Philippines into equity by buying the State-owned enterprises at a substantial discount.

In sum, the prospects for long-term industrial growth appear better than in the recent past. But it is difficult to predict how speedily the reform measures will make an impact on the manufacturing sector as a whole. Nevertheless, the reform could provide a powerful impetus to efficiency-oriented industrialization, which has hitherto been hindered by policies that failed to take into account basic market forces.

4. Thailand

Thailand's GDP growth rates, 4 per cent and 3.8 per cent in 1985 and 1986 respectively, have exceeded those of other ASEAN member countries. The prospects are for similar growth rates in 1987 and 1988, if not slightly better ones, depending on world market demand for Thai products, particularly manufactured goods. MVA is expected to grow by 5.3 per cent in 1987 and 4.4 per cent in 1988.

Unlike the experience of other ASEAN member countries, export demand for Thai products has remained brisk, with total exports in current value rising by 19.2 per cent in 1986. This compares with a 1.7 per cent decline in imports in the same year, largely owing to savings on oil. Leading export items included canned food, jewellery, leather goods and other non-traditional manufactured goods (such as textile products), which surged by 22 per cent. The export performance reflects the persistent efforts made in the past to diversify into industry from a rice economy. The manufacturing sector now dominates, accounting for 19.8 per cent in GDP in 1985, as compared with the shrinking agriculture sector, the GDP share of which fell from 23.9 per cent in 1981 to 17.4 per cent in 1985.

The economy is poised to forge ahead with further industrial restructuring giving priority to agro-based and labour-intensive industries. The sixth five-year plan (1987-1991) embraces an export-led strategy aimed at achieving 5 per cent overall annual growth (6.6 per cent in industry, 2.9 per cent in agriculture and 9.9 per cent in the export sector) and creating 3.9 million new jobs by the end of the plan period. The private sector is seen as the main driving force, with a decline in the public sector role according to the pattern of budget allocations. Small- and medium-sized enterprises will receive major government support in the form of overseas marketing promotion and the provision of an information and monitoring system. Whether world market demand will provide a sufficient stimulus to Thai industry remains to be seen.

5. Singapore

Singapore, the financial centre and entrepôt for the ASEAN region, suffered negative GDP growth (−1.8) in 1985, and in 1986 the growth rate barely recovered to 1.9 per cent. There are, however, a few signs to justify some cautious optimism for a continued recovery in 1987 and 1988 at about 3.3 per cent and 2.5 per cent GDP growth respectively. Foreign and domestic investment is picking up, the Government is ready to inject infrastructure investment expenditure, and the surge of exports of manufactured goods is expected to continue as the relative labour-cost disadvantage is being corrected.

Assisted partly by the rise in the value of the Japanese yen by 45 per cent against the Singapore dollar, exports rose in real terms by 25 per cent in 1986, as against a 9.2 per cent increase in imports. This export performance was sustained by a rapid growth in output of electronics equipment, apparel, fabricated metal products, transport equipment, electrical machinery and petroleum products, with all these industries recording double-digit growth in the third quarter of 1986 (potentially the turning-point after five consecutive quarters without growth). The manufacturing sector's leadership in growth provides some contrast to the prevailing slump in construction (with a job loss of 2,900 in 1986) and services, including commercial, financial and business services heavily reliant on the ASEAN region's economic activities.

A policy package, quickly assembled and put into effect early in 1986, also seems to have contributed towards a recovery. First, the high-wage policy adopted earlier was reversed and frozen temporarily for at least two years.* Second, in order to improve the business environment, corporation tax as well as personal income tax was cut from 40 per cent to 33 per cent; tax credits have been increased for research and development, investment in new technology and innovation. The contribution to the Central Providence Fund levied on employers was cut from 25 per cent of an employee's wages to 10 per cent, helping to reduce the overall wage costs to the employer by 12 per cent. Third, public works spending was stepped up by 50 per cent, for example on the mass rapid transit project. General development spending by the Government is expected to continue at a similar pace (with a 50 per cent increase) during the 1986-1987 period.

Foreign as well as domestic investment also grew. Foreign investment commitments grew by 7 per cent during the first half of 1986 over the same period in the previous year; local investment commitment surged by 45 per cent for the same period. Particularly notable is the Japanese direct foreign investment in Singapore, which rose by 51 per cent during the 12-month period to March 1986, while Japanese direct foreign investment for Asia as a whole declined by

*Unit labour costs for each United States dollar of output in 1985 were $0.48 in Singapore, compared with $0.30 in the Republic of Korea and $0.32 in Hong Kong.

Table 28. Japanese direct foreign investment in Asia, 1986

Country or area of investment	Year to March 1986 (millions of dollars)	Percentage change from previous year
Indonesia	408	+9
Singapore	339	+51
Republic of Korea	134	+25
Hong Kong	131	-68
Taiwan Province	114	+75
China	100	-12
Malaysia	79	-44
Philippines	61	+33
Thailand	48	-60
Brunei	1	-80
Others (including India)	20	-5
Total	1 435	-12

Source: Japanese Ministry for International Trade and Industry, cited in *The Economist*, 25 October 1986, p. 80.

12 per cent in the same period (see table 28). Singapore appears to be one of the obvious beneficiaries of Japan's search for cheaper intermediate input sourcing accentuated by the yen-dollar realignment.

But, as in the cases of other export-dependent economies, the question remains whether the world trading system will function in such a way as to enable the Singaporean economy to continue to grow. Trade issues involving Japan, the United States and the EEC appear crucial for Singapore's immediate and long-term future.

J. China

While the goal of other regions of the world in 1985 and 1986 was to reflate their economies, that of China was to cool down an overheated economy through

Table 29. Industrial output targets of seventh five-year plan: China, 1986-1990

Item	1985 actual	1990 target	1986-1990 target annual average change (percentage)	1981-1985 actual annual average change (percentage)
	(millions of tonnes, unless otherwise stated)			
Gross industrial output	923.30[a]	1 324.00[a]	7.5	12.6
Producer goods				
Cement	142.50	180.00	4.8	12.3
Chemical fertilizers	13.30	16.30	4.2	1.5
Ethylene	0.65	1.20-1.40	13.0-16.6	5.8
Paper and paperboard, machine made	8.30	10.00	3.9	9.2
Rolled steel	36.80	44.00-46.50	3.6-4.8	6.3
Soda ash	2.00	3.50	1.8	4.4
Steel	46.60	55.00-58.00	3.5-4.5	4.7
Timber	63.20[b]	68.00-72.00[b]	1.5-2.7	3.3
Vehicles	439.00[c]	560.00[c]	5.0	14.6
Consumer goods				
Beer	3.10	6.50	16.0	35.1
Beverages, non-alcoholic	1.00	3.00	24.5	...
Chemical fibres	0.95	1.45	8.0	16.1
Cigarettes	23.50[d]	26.00[d]	2.0	9.1
Cloth	14.30[e]	16.20[e]	2.5	1.2
Garments	1.70[f]	2.80[f]	10.5	...
Refrigerators (for home use)	1.39[g]	6.50-7.50[g]	36.1-40.1	95.2
Sugar, refined	4.45	5.50-6.00	4.3-6.2	11.6
Synthetic detergents	1.00	1.40	7.1	20.5
Television sets	16.22[g]	15.00[g]	-1.6	45.4
Colour television sets	4.10[g]	5.00[g]	4.0	164.0
Washing machines	8.83[g]	12.00[g]	6.3	104.8
Energy				
Total primary energy output (standard coal equivalent)	841.00	991.00	3.4	5.3
Coal	850.00	1 000.00	3.3	6.5
Crude oil	125.00	150.00	3.7	3.4
Electricity	407.30[h]	550.00[h]	6.2	6.3
Natural gas	12.86[i]	15.00[i]	3.1	2.1

Source: Ministry of Finance of China.

[a] Billions of yuan renminbi at 1980 constant prices.

[b] Millions of cubic metres.

[c] Thousands of units.

[d] Millions of cases.

[e] Billions of metres.

[f] Billions of pieces.

[g] Millions of units.

[h] Billions of kilowatt-hours.

[i] Billions of cubic metres.

contractionary monetary and fiscal policies. The effort to slow down industrial growth bore fruit. The growth rate declined from the unsustainable 18 per cent of 1985 to a more manageable rate of 9.2 per cent in 1986, which was still higher than the planned average target rate of 7.5 per cent envisaged in the seventh five-year plan period (1986-1990) (see table 29 for industry figures). The need to slow down industrial growth arose from bottlenecks in supplies of raw materials, energy, foreign exchange and infrastructural services (transportation, communications and banking) which threatened to lead to continued double-digit inflation in major cities (the inflation rate was 11.2 per cent in 1985). During the first eight months of 1986, inflation slowed to an annual rate of 5 per cent, according to official figures.

The slower growth in 1986 is observable in the output of most industries, except iron and steel, electricity and watches (see table 30). A drastic reduction in growth occurred in the production of refrigerators (from 195.5 per cent in 1985 to 54.6 per cent in 1986), colour television sets (from 140 per cent in 1985 to 13.6 per cent in 1986), cassette recorders (from 94.9 per cent in 1985 to 26 per cent in 1986) and washing machines (from 64 per cent in 1985 to zero per cent in 1986). The booming demand for consumer durables had to be curtailed, particularly since most intermediate inputs had to be imported, thus adding to the balance-of-payments difficulties. But the latent demand for these products appears to be still high,

Table 30. Growth rate of industrial output: China, 1985 and 1986

(Percentage changes in real terms over same period in previous year)

Item	*January-September 1986*	*January-September 1985*
Heavy industrial output		
Steel	11.7	7.0
Rolled steel	9.8	9.7
Coke	6.7	7.4
Pig iron	15.9	6.8
Cement	13.9	18.4
Plate glass	5.4	17.7
Machine tools	3.7	19.2
Power equipment	30.8	39.6
Electricity	9.1	8.7
Coal	1.2	11.5
Oil	3.4	10.0
Fertilizers	0.7	-6.1
Motor vehicles	-15.8	52.3
Small tractors	-11.2	30.8
Consumer products		
Washing machines	0.0	64.0
Colour television sets	-13.6	140.0
Cameras	21.9	42.5
Bicycles	7.6	14.4
Cassette recorders	26.0	94.9
Refrigerators	54.6	195.5
Watches	39.7	16.5
Electric fans	16.5	83.6
Construction spending		
Total investment	9.5	38.6
Productive	15.2	25.2
Non-productive	2.1	61.2

Source: State Statistical Bureau of China

with rising wages (over 20 per cent increases in 1985 and 1986) and accumulated household savings sustaining pent-up demand.

The industrial outlook for 1987 and 1988 therefore seems to depend upon how these supply-side bottlenecks could be alleviated. To that end the Government introduced a set of measures in 1986, including the following: measures to ease balance-of-payment difficulties (for example, currency devaluation, external borrowing from international capital markets, as well as from multilateral lending agencies such as the International Monetary Fund (IMF) and the World Bank, encouragement of joint ventures for export-oriented and import-substitution enterprises, and in some cases the requirement of counter-purchases); and measures of more long-term nature to upgrade the industrial structure, to reform basic institutions and thereby to improve efficiency (for example, greater incentives given to joint ventures and technology transfer in priority sectors, profit incentives, market competition, introduction of a system of responsibility applicable to factory managers and development of Chinese-style capital and labour markets). The pace of implementing the latter set of measures slowed down somewhat in early 1987, when the need to reaffirm the social consensus arose.

The series of measures represent a fundamental shift in the strategy of Chinese industrialization, the goal of which is to quadruple economic output by the year 2000. Many obstacles lie in the way of their implementation, but they have already had a powerful impact on the economy, contributing to the overheating that occurred in 1986. The prospects for achieving the target rate of industrial growth (7.5 per cent) are good for 1987 and 1988, with UNIDO projections showing rates of 10 per cent and 9 per cent respectively.

A series of financial measures were also introduced in 1986 to alleviate the foreign exchange shortages. In July 1986 the Bank of China announced a devaluation of the Yuan renminbi against the United States dollar by 15.8 per cent, presumably to squeeze imports that remained high despite controls, and perhaps also to boost exports, though the expected results would be small. The Government has changed its borrowing policy, now turning to Euromarkets and even to the United States. Its total borrowing has been estimated at $6 billion and it is said to be increasing. The World Bank has pledged $1.12 billion for 11 projects during its fiscal year 1986-1987.

The unexpected fall in foreign direct investment in 1986 prompted the Government to reverse the laws relating to investment. Foreign direct investment fell during the first nine months of 1986 by 42 per cent from the level of the same period in the previous year, reversing the trend since 1979 when the door was opened to foreign investors. The fall was attributed to several causes such as high production costs (including wages), low productivity and bureaucratic interference in business decisions, but above all to the difficulty in obtaining foreign exchange to be used for imports of input materials and remittances of profits. Some joint ventures were told to export and earn their own foreign exchange for these purposes. However, when foreign direct investment slowed and production by some

joint-venture enterprises stopped, the policy makers were obliged to drastically increase incentives for such investment. Their action has confirmed the Government's intention to use foreign direct investment as a major instrument for upgrading China's industrial structure.

In October 1986 the State Council issued "Provisions concerning the encouragement of investment by foreign business"—new guidelines that offered eligible enterprises lower taxes, reduced labour and land-use fees, provided for more managerial freedom to hire and fire, encouraged joint ventures to swap currencies (the holder of a foreign exchange surplus can thus sell to other foreign-exchange deficient enterprises), established a new grievance board working under the State Economic Commission to combat bureaucratic interference by local government, and abolished customs duties on imported goods needed to make export products. Broadly, "product-exporting enterprises" and "advanced-technology enterprises" would be eligible for these benefits. But how these terms are to be defined and applied remains to be seen, particularly since different provinces and metropolitan areas are allowed to interpret them according to local needs, rather than according to precise rules laid down at the national level. However, to qualify as an exporting enterprise, a venture should demonstrate that it will produce a foreign exchange surplus after all its foreign currency expenditures have been deducted from revenues.

Advanced-technology enterprises are more difficult to define precisely, since the term does not necessarily refer to the most sophisticated technology. Officials say the term will be "broadly applied" to allow benefits for import-substitution ventures. But the priority industries are more clearly designated, including textiles, food processing and packaging, electronics, machinery, fine (or non-basic) chemicals and pharmaceuticals, new building materials and energy-related technology, in accordance with the seventh five-year plan.

The extent to which the new incentives will boost foreign direct investment activities to earlier levels remains to be seen. By the end of 1985, according to an official statement, China had received $5.3 billion in foreign direct investment,* and expected more to come, given the total foreign direct investment of over $16 billion contracted during 1979-1985. It has been estimated that more than $20 billion in new foreign direct investment may be needed to achieve the goals set in the seventh five-year plan (1986-1990).

If opening the economy to foreign direct investment was a radical change of industrialization policy, so also was the introduction, on the domestic front, of decentralization, market competition and the factory-director responsibility system based on profit incentives (see box: "Chinese experiments in quest of management efficiency"). The 1985-1986 period saw a steady implementation of the reform launched in December 1984 with a view to achieving efficiency based on competition. Though fraught with problems of transition, decentralization of industrial production has been increasing. Out of 54,000 large and medium-sized State-run industrial enterprises, some 28,000 had been converted to the factory-director responsibility system by the end of June 1986, a huge increase from the 190 enterprises implementing the system on an experimental basis in 1984. More than half of all investment is now reported to be taking place outside the central plan and State budget, and a third to half of all commodity transfers in the country outside the State allocation system or official sales network. Evidence, though scattered, shows that management efficiency has improved for the reformed enterprises.

In the city of Shenyang, for instance, 233 State enterprises under the factory-director responsibility system recorded a 22.8 per cent increase in output and a 56.6 per cent increase in profit in 1985 (with international standards of product quality). Driven by profit incentives under the new system, industrial enterprises continued to invest and produce beyond the level that the existing infrastructure could sustain.

The deliberate deceleration of industrial growth currently in force was prompted by increasing shortages of raw materials, energy, transportation and communications facilities. Policy makers learned that the market mechanism could not be introduced overnight into an economy which has been operating on a totally planned basis over the past three decades (up to 1980). The Government therefore decided to take gradual steps. The year 1985 saw liberalization of a set of consumer products, including processed food, watches, fans and sewing machines. In September 1986 came the announcement of a second batch of goods for which the market was to determine the price and output, including bicycles, refrigerators, washing machines, radio-cassette recorders, black-and-white television sets and textile goods.

An immediate consequence was a price hike of 20 to 40 per cent for some preferred items among the liberalized products. However, other product items for which the Government determined the price have suffered from output mismatches, in other words, accumulation of unsold goods amid shortages or a surplus-shortage cycle for a single product. In Anhui Province, for instance, a sudden shortage of manufactured fertilizers was experienced, as the provincial government decided to reduce fertilizer imports and to close fertilizer plants in the region after a period of glut in the summer of 1986. Not enough fertilizer had been stockpiled locally on the assumption of a plentiful supply at the low price fixed by the State. But in October 1986 the black market price had soared to 200 per cent of the fixed price.

Similar problems existed even for the "marketized" or liberalized goods. Most of the producers, especially in rural areas, had little experience in marketing their own goods. Furthermore, local markets had been isolated by long distances and lack of information about demand and supply conditions in other provinces. Now that producers are free to sell their output across

*According to another source the investment breakdown was as follows: $500 million in 362 equity ventures; $3.5 billion in 1,372 co-operative enterprises (for example, contractual joint ventures); $2.4 billion in 31 offshore oil contracts; $800 million in 1,137 compensation trade ventures; and $600 million in other types of ventures, including 53 wholly foreign-owned operations. See *China Trade Report*, January 1986, pp. 1 and 4.

Chinese experiments in quest of management efficiency

As is well known from literature on the Chinese economy, enterprise managers in an earlier period were paid little more than skilled workers. The State siphoned off profits with scarcely any material reward to encourage workers and managers to exert extra efforts for superior performance. Production quotas were assigned to each enterprise by the State and output was sold at State-determined prices. The State marketing agency had to sell whatever was produced by the State-owned industrial enterprises. Furthermore, the State allocated investment funds from the budget according to production targets and priorities for industrial sectors and geographical regions. Workers were virtually assigned to be employed in factories according to State-planned output. Under such an incentive system, managers had little motivation to economize on scarce resources or to improve product quality and technology. This state of affairs seems to have contributed to widening the technology gap between China and more developed economies. Overstaffing and output mismatch (that is, inventory accumulations for some commodities and supply shortages for others) were prevalent problems. The State had to subsidize inefficient enterprises to save them from dying. In effect, the system taxed the efficient to support the inefficient.

The current reform package for enterprise management differs radically from the earlier system. Under the new system, the enterprise will be given the autonomy to:

> . . . plan its production, supply and marketing; keep and budget funds it is entitled to retain; appoint, remove, employ or elect its own personnel according to relevant regulations; decide on how to recruit and use its work-force, and on wages and rewards; set the price of its products within the limits prescribed by the State . . .

In short, enterprises will gradually become independent (subject to the timing of the phase-out process, the indicative plan established by the Government and macro-policies) and responsible for their own profits and losses. State ownership will not, in principle, affect the day-to-day operation of enterprises, which will be in competition for profits. However, the precise mode and extent of profit retention as a reward for efficiency has been the subject of debate and experimentation in China in recent years. The heart of the issue is how to devise a rule for profit-retention so as to induce maximum possible efficiency within enterprises.

In the context of Chinese experiments on profit-retention as a reward for enterprise performance, the following systems are noteworthy:

1978: Some enterprises fulfilling plan targets were allowed to retain an amount of profits equivalent to a fixed percentage of the wage bill (enterprise funds system);

1979: Some enterprises were entitled to a fixed share of base profits plus 10 to 30 per cent of incremental profits (incremental profit system);

1981-1983: *(a)* Retention of a large share of profits above a target profit (profit target system);

(b) Sharing profits between the enterprise and the State according to a scale determined by the authorities (profit-sharing system);

(c) Paying taxes rather than sharing profits (profit tax system).

The latest reform announced in 1984, *(c)* above, was an attempt to reduce State control more radically and to give more complete independence and responsibility to enterprises than before. Under this scheme, enterprises became completely responsible for both profit and loss, retaining profits after paying four sets of taxes and charges (income tax, revenue-adjustment tax, fixed asset charge and a working capital charge) which were designed to siphon off above-average profits due to locational or technical factors and to favourable cost-price relationships. About 60 per cent of retained profits should be reinvested in the enterprise, which must bear any losses incurred without State subsidies to cover them.

The policy shift embodied in the incentive efficiency linkage aims at promoting greater managerial efforts and ingenuity to achieve increased efficiency through material rewards to managers. The most recent government decision explains the reason for change as follows:

> The well-spring of vitality of the enterprise lies in the initiative and creativeness of its workers by hand and brain. When the status of the working peoples as masters of their own enterprise is guaranteed by its rules and regulations and when their labour is closely linked with their own material benefits, their initiative, wisdom and creativeness can be brought into full play. This will arouse their deep interest in the operation and effectiveness of their enterprise, so that their performance is closely linked with their social prestige and material benefits.

The motivational system envisioned in this statement represents a turn-about from the earlier emphasis on "social conscience, reinforced by group pressures from fellow workers, rather than monetary rewards".

Source: "Sources of manufacturing efficiency: some evidence from East Asian economies and implications for current reforms in China", *Industry and Development*, No. 16 (UNIDO publication, Sales No.E.85.II.B.10), pp. 59-91.

the provinces, the need for infrastructure (that is, transportation, communication and information services) to link inter-provincial markets became suddenly urgent. In the absence of adequate facilities, a smooth flow of goods and services can hardly be expected, and sudden changes in prices of output and input (for example raw materials and wages) could jeopardize the inexperienced, unprepared enterprises.

Thus, during the first eight months of 1986, the number of loss-making State-owned enterprises grew to 6,800, or 17.6 per cent of all State-run industrial enterprises, up from 10.5 per cent and 10.7 per cent in 1984 and 1985 respectively. The total value of the losses estimated for the first eight months of 1986 represented a 69.8 per cent increase over the same period a year earlier. Whether to subsidize such losses with State funds as before, or firmly apply the newly contemplated "Enterprise Bankruptcy Law" to the worst cases, remains a delicate policy issue.

Already in July 1986, a collective enterprise in Shenyang (Liaoning Province) was declared bankrupt, the first such case, involving Shenyang Explosion-Proof Equipment Factory. The closure is reported as an experiment based on a tentative definition of insolvency applicable to cases in which accumulated losses exceed 80 per cent of fixed assets. Under the definition, a large number of enterprises might appear vulnerable. Recently a draft bankruptcy law has been approved by the State Council and submitted to the Standing Committee of the National People's Congress for a final decision.

Along with the Enterprise Bankruptcy Law, complementary reforms have been implemented to regulate industrial employment practices taking effect from October 1986. The reforms introduce a labour-contract system applicable to all new workers at State enterprises, specify procedures for recruitment and dismissal, and stipulate a new unemployment insurance system. They are designed to bring about efficiency by eliminating the conventional State allocation of labour and hereditary jobs, by subjecting work performance to periodical evaluation, and by permitting labour mobility. Experiments with the new labour-contract system began in 1980 at selected enterprises. So far, about 3.5 million of the 123 million industrial work-force are reported to have signed contracts.

In order to provide a safety net for the unemployed between jobs, an unemployment insurance scheme has been created. Workers dismissed, laid-off, or who lost jobs through bankruptcies can collect 60 to 75 per cent of their average wage over the previous two years for the first 12 months of unemployment, and 50 per cent for the second 12 months. To finance the unemployment insurance programme, State enterprises are required to contribute 1 per cent of their total basic wage bill to the fund administered by provincial or municipal authorities.

An important aspect of the employment reforms, however, concerns a new provision for competitive recruitment procedure. Enterprises are required to allow any qualified urban or rural job-seekers with official permission to take an employment examination and to publicize the list of all persons who are selected for employment. This new procedure is intended to improve labour mobility and efficiency in labour allocation, particularly among skilled workers, engineers and other professional categories. If fully implemented, the reform could have a revolutionary effect of efficiency creation in the Chinese-style labour market.

An equally revolutionary measure involving a "Chinese-style financial market" was also experimented with in 1986. Under the experimental scheme, industrial enterprises are encouraged to raise investment funds by selling bonds or shares, though only with permission from the People's Bank of China. Stock exchanges of a sort, though rudimentary, have been born in some selected locations, notably, Shanghai, Shenyang and Guangdong. Some share issues are sold through banks or even investment underwriters. In Guangdong Province, for instance, 500 million yuan renminbi have been raised by 800 enterprises. But unlike stocks in developed market economies, Chinese stocks involve several special conditions, in particular: there is a maximum (up to 15 per cent) and a minimum (based on the current interest rate) return; some may have fixed terms of maturity from one to five years, while others may be of unlimited duration; State enterprises must possess at least 51 per cent of their own stocks; and preferred major stock buyers are to be employees of the stock-issuing enterprises. These experiments can be expected to lead to an effective stock market development, as other reform processes have already demonstrated.

Such developments will add to the existing financial instruments for industrial enterprises to raise and allocate investment funds, namely, bank loans which have only recently begun to replace the conventional State grants. The banking system, reformed in 1983, includes the Industrial and Commercial Bank, which provides loans to industrial enterprises and discounts bills subject to regulation by the Central Bank. Reportedly, the banking officials are going through a careful learning-by-doing process in assessing worthwhile proposals. Nevertheless, the new banking system would seem to provide indirect leverage to adjust the level of industrial activities through credit controls, as in the case of the credit squeeze of 1986.

All these multifaceted institutional reforms reflect the policy makers' eclectic pragmatism and firm commitment to lay the foundation for the industrialization of China. Although the ultimate fate of the reforms remains an open question, it seems clear that an economic driving force has been created, as China's industrial growth performance has demonstrated in the last few years. The plan target for industrial growth would seem well within the feasible range at least in 1987 and 1988.

K. Concluding remarks

The year 1986 was a highly eventful one for the world industrial economy. Of special significance were a variety of policy measures designed to affect the flow of complementary factors such as capital, new technology and managerial skills, so as to restructure,

upgrade and expand ir ies. The measures generally adopted to meet the challenge included joint ventures, decentralization in decision-making, privatization of State-owned enterprises and institutional reforms (for example, more competition and a system of incentives based on efficiency). The changes in strategies and priorities reflected in many of these reforms appeared to be dictated not so much by ideology as by pragmatism and the need to alleviate domestic socio-economic tensions built up by changing external constraints.

At the close of 1986 and the beginning of 1987, however, the global mechanism for demand management still leaves very much to be desired. No single country or region can be self-contained in its adjustment effort, nor can it be powerful enough to provide a "locomotive pull" to the perturbed structure of global interdependence. Supply-side adjustment at the level of individual countries continues to be essential. But, as noted in this chapter, it would not be a sufficient condition for international development. Achieving and sustaining a higher level of growth will require further progress in international co-operation and co-ordination of reflationary policy measures (on the demand side) among the major industrial powers. The short-term global outlook depends on their concerted action.

III. External economic shocks and their impacts on industrial investment and output

The 1980s have been a period of uncertainty, instability and difficult adjustment for the world economy. Exchange rates of the major currencies have fluctuated to an unprecedented extent. The recession at the beginning of the decade brought about an absolute fall in GDP, and not just a decline in positive growth, in some OECD countries. The debt burden of consumers and companies in these countries increased as did the number of bank and company liquidations. The United States became a net debtor for the first time in 50 years and the United Kingdom ran a trade deficit in manufactures for the first time in 200 years. Developing countries have been especially vulnerable to the multiple external shocks that occurred towards the end of the 1970s and the beginning of the 1980s: falling commodity prices and the consequent worsening of the terms of trade for exporters of primary products; a steep rise in the price of oil and its subsequent fall in 1985; the recession of 1980-1982 in developed countries followed by sluggish growth; the sudden rise in nominal and real interest rates reversing the assumptions under which large debts had been contracted; and the volatility in the exchange rates of their major trading partners. These shocks were not the cause but the symptoms of fundamental disequilibria in the world industrial economy, including: global trade imbalances and the inadequacy of an international financial system that does not permit adjustment of imbalances without causing a growth recession; and disruption of the industrialization process in developing countries.

The main concern of this chapter and its appendices is the consequences of these shocks for the manufacturing sectors of developing countries. An attempt is made to quantify those consequences for 18 developing countries where adequate statistical data exist. This exercise is intended primarily to shed some light on inter-country variations of certain key factors which influence the ways in which different developing countries adjust to external shocks. The quantitative exploration is followed by a brief description of the policy reform experience in four countries—Nigeria, Peru, the Philippines and Sri Lanka.

The main conclusion of this cross-country assessment is that manufacturing industry has suffered most from the various external shocks. There have been marked reductions in real manufacturing investment and output as a result of sharp cutbacks in imports of industrial intermediate goods and capital goods. This sudden reversal in the process of industrialization has dimmed the prospects for sustained economic growth in developing countries. The long-term cost of adjustment policies, involving a sharp curtailment of manufacturing activities, might in some instances far outweigh the benefits for which they were intended. Adjustment measures must be well-planned, since the capacity to adjust to external shocks depends on the size and efficiency of the manufacturing sector.

The qualitative analysis of the policy responses of the four countries shows variations across countries as well as over time within each country. Policies regarded as orthodox have been abandoned and what was previously rejected has been embraced. Above all, the analysis shows how strongly policy is influenced by domestic socio-political constraints, and how innovative decision-makers must be to cope with the severe challenges facing these countries.

The background of the decline in industrial production and investment is outlined first. Then the logic involved in quantifying the economic consequences is described, followed by an analysis of the implications of the available data. Specific country experiences are then reviewed. No attempt is made to fit these experiences into a common framework. Each case involves certain types of policy measures that are adopted or abandoned in various situations. Parallels emerge as the country experiences are described, and some common lessons are drawn in the conclusions.

A. The slow-down in manufacturing production and investments

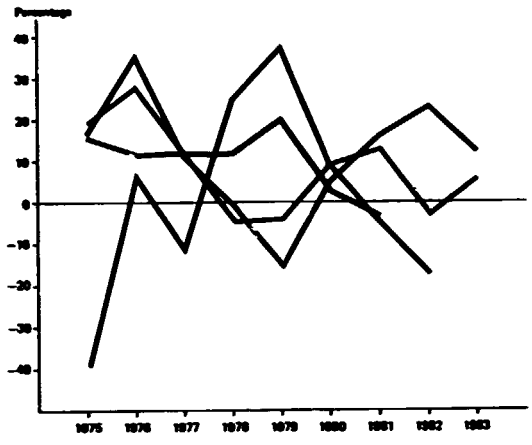
The beginning of the present decade appears to mark a turning-point in the pattern of vigorous growth of MVA and investment in the 1970s in developing countries. Those countries suffered a sharp decline in MVA of over 5 percentage points in 1981, representing an 82 per cent fall from the average growth rate of 6.25 per cent in the 1970s (see table 31). For many countries, real investment declined sharply in the 1980-1982 recession period, continuing its slide beyond 1982 and never recovering. This occurred in most developing countries irrespective of region, resource endowments and stage of development, with rare exceptions such as Colombia, Indonesia and Turkey (see figure XIII).

More revealing and meaningful is a comparison of the average annual real growth rates of cumulative manufacturing investment with those of MVA (both

Figure XIII. Three-year moving average growth rates of manufacturing investment in selected developing countries and areas

(Percentages, based on 1980 constant dollars)

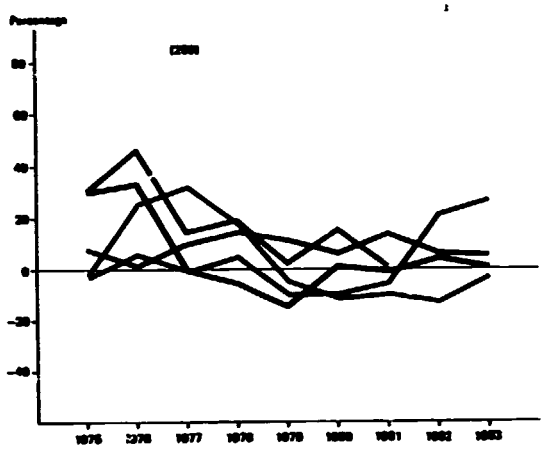
Latin America



Key:

Brazil
Chile
Colombia
Ecuador
Mexico

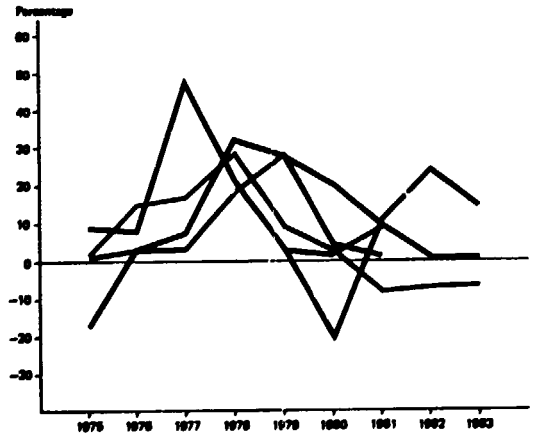
North Africa and Western Asia



Key:

Cyprus
Egypt
Kuwait
Malta
Tunisia
Turkey

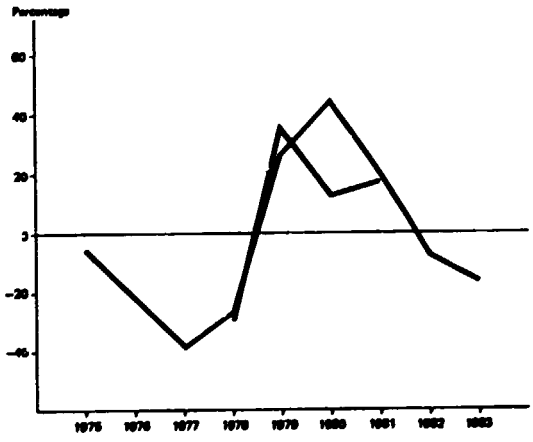
Asia



Key:

Hong Kong
India
Indonesia
Philippines
Republic of Korea
Singapore

Africa



Key:

Swaziland
Togo
Zimbabwe

Source: UNIDO data base.

Table 31. MVA annual growth rates for developing economies by region, 1970-1985

(Percentages)

Developing region or grouping	*1970-1979 (average)*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*
Developing countries[a]	6.25	4.6	1.1	0.5	2.3	6.0	3.2
Latin America	5.53	3.8	−3.2	−2.1	−2.3	5.2	2.5
Tropical Africa	4.56	7.1	3.6	1.1	−3.2	−1.6	3.6
North Africa	5.28	11.1	6.1	6.5	7.1	5.1	4.3
West Asia	7.12	3.8	7.3	8.5	9.4	4.4	6.2
Indian Subcontinent	2.20	2.6	5.1	2.6	5.4	5.9	6.5
South-East Asia	11.95	16.1	6.3	1.8	4.0	12.0	4.1

Source: UNIDO data base.

[a]Excluding China.

smoothed out by three-year moving averages) in various periods before and after the watershed year 1980. Since cumulative investment provides a reasonable measure for capital stock, the ratio of the growth rates of the two variables roughly represents the incremental capital-output ratio (ICOR), which could gauge, among other things, the operational efficiency of capital and the degree of capacity underutilization. Figure XIV presents such a comparison. Most notable in the figure is a general continuous decline in the growth rates of both MVA and cumulative investment over time across the countries, with a few exceptions, as shown by the direction of movement of trend lines from the upper-right corner to the lower-left corner. The slope of the line plunges sharply between period 2 (1978-1980) and period 3 (1980-1982), which may indicate a more than proportionate drop in the growth rates of MVA relative to a similar reduction in the growth rates of estimated capital stock between the two periods. Such a disproportionately greater decrease in the MVA growth rate may reflect a substantial reduction in manufacturing output caused by various supply bottlenecks such as shortages of imported industrial inputs and the consequent marked increase in excess capacity in the manufacturing sector during the observed periods.

The sudden deceleration of capital formation in the manufacturing sector has obvious far-reaching implications for economic growth, stability, employment and the standards of living in developing countries. As stated earlier, some developing countries such as Singapore and India managed to sustain the process of capital accumulation even during the stagflation period of 1980-1982. But for the majority of developing countries analysed here, the external payments crisis caused by various external shocks and adjustment policies appear to be mainly responsible for the steep downturn in the growth of manufacturing productive capacity in the early 1980s.

The reasons for the sharp fall in investment are not difficult to detect. The severe external shocks of the post-1979 period have forced developing countries to adjust both by demand contraction and significant restructuring to increase export competitiveness. But permanent restructuring is a time-consuming process, while the external payments crisis requires immediate attention. Lacking sufficient foreign exchange to absorb the external shocks, most developing countries (and many developed ones as well) were forced to resort to macro-economic contractions and particularly severe import cutbacks. Still worse, they tended to adjust by cutting into investment more deeply than consumption. Greater investment reduction was often the only available alternative, when consumption was already at the bare minimum, and the import coefficient of investment spending tended to be higher than that of consumption. The same holds for imports of crucial industrial supplies, with the inevitable negative effects on capacity utilization.

The empirical evidence seems to confirm that the burden of import adjustments fell most heavily on capital goods and industrial inputs. In appendix II of this chapter, table 44 on the share distribution of total imports by broad commodity groups in various developing countries and areas reveals clearly this general trend. In most African countries, the import shares of machinery and equipment were markedly down, while those of foods and fuels were on the rise during much of the 1978-1982 period. Likewise, the import shares of machinery and industrial supplies were steadily slashed, while fuel imports claimed a bigger share in many Latin American countries at varying times between 1978 and 1984. The same picture emerges for the imports of machinery and industrial supplies in most countries of North Africa and Western Asia, but obviously the import shares of fuels increased only for the non-oil economies of the region in 1978-1984. Similarly, for most Asian countries, the import shares of fuels rose substantially at the expense of the imports of industrial inputs during the same period. But the import shares of machinery and equipment did not present a consistent picture; the share was actually up throughout the period of 1978-1984 in a few countries or areas like Hong Kong and Indonesia, while the same import shares of India, the Philippines and the Republic of Korea initially declined in 1978-1981, but subsequently recovered during the remainder of the period.

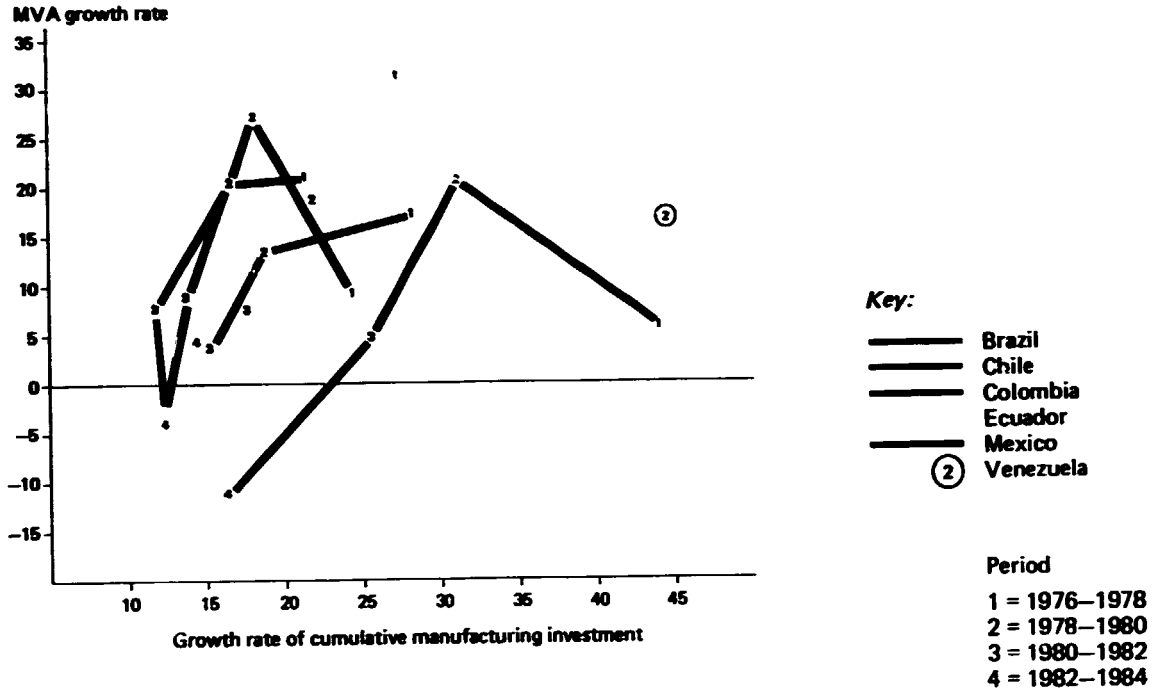
B. External shocks and their transmission process

1. Nature of the shocks

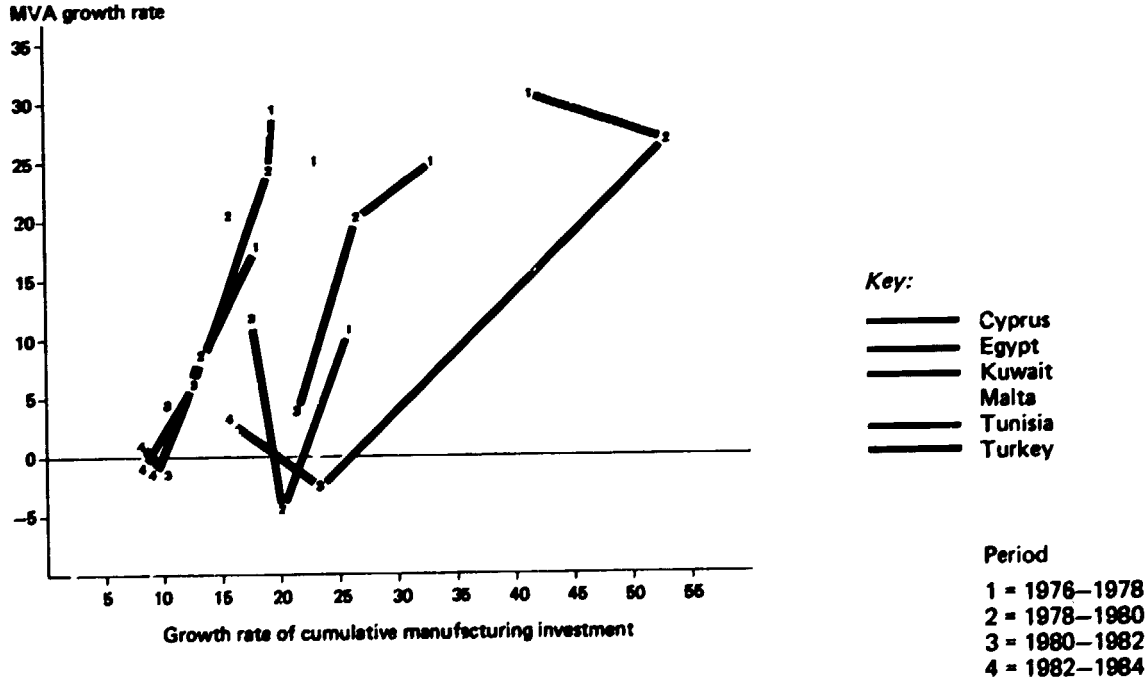
The complex process whereby external shocks impinge upon the economic system, affecting output, employment and investment, operates through the balance-of-payments constraint. An external shock like the oil price rise of 1979-1980 (itself a response by OPEC countries to the stagflation of 1974-1979) is felt by all non-oil-exporting countries, both developed and

Figure XIV. Average annual growth rates of MVA

Latin America



North Africa and Western Asia

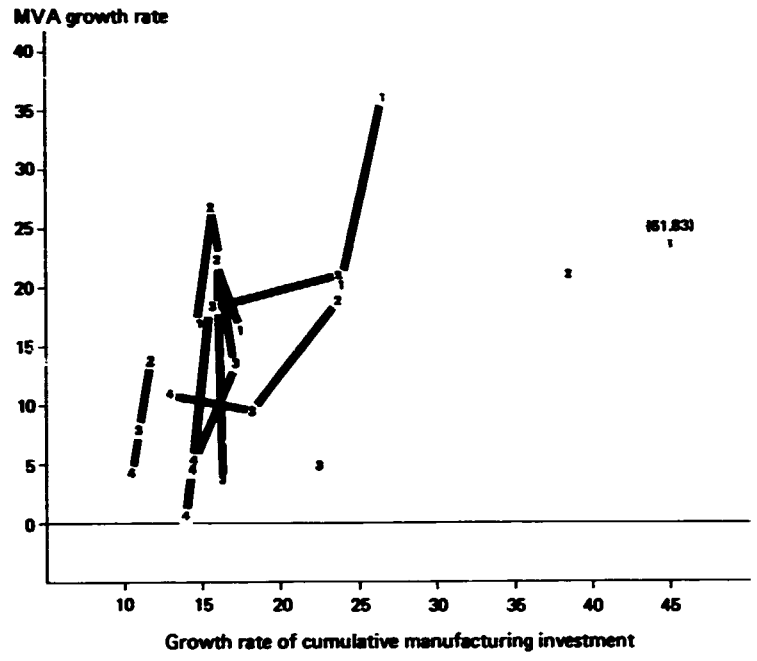


Source: UNIDO data base.

[a]MVA and cumulative investment are three-year moving averages at 1930 constant dollars.

and cumulative manufacturing investment[a]

Asia



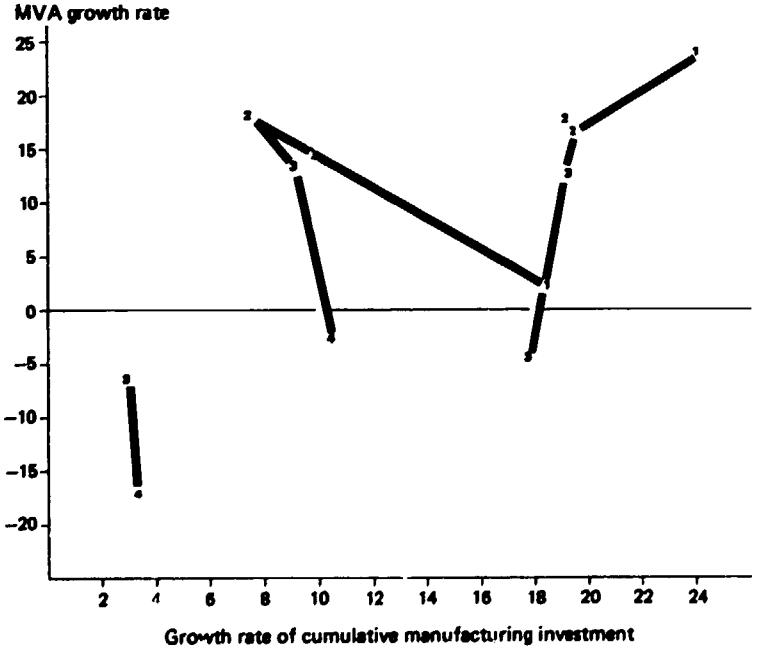
Key:

- Hong Kong
- India
- Indonesia
- Philippines
- Republic of Korea
- Singapore

Period

1 = 1976–1978
2 = 1978–1980
3 = 1980–1982
4 = 1982–1984

Africa



Key:

- Malawi
- Swaziland
- Togo
- Zimbabwe

Period

1 = 1976–1978
2 = 1978–1980
3 = 1980–1982
4 = 1982–1984

developing. But the response of developed countries to the second oil shock transmitted even more shocks to developing countries. The sequence of shocks beginning in 1979-1980 was as follows:

(a) There was a doubling of oil prices in 1979-1980 and deflationary economic policies in developed countries. This led to *(b)* and *(c)* below;

(b) Nominal and real interest rates rose in 1980-1983;

(c) Developed economies experienced recession in 1980-1982 which was transmitted to developing countries producing the effects described in *(d)* and *(e)* below;

(d) Developing countries have suffered from a fall in primary commodity prices and in export revenues and from worsening terms of trade since 1981;

(e) An increased burden of debt service charges has been imposed on developing countries, absolutely and as a proportion of exports, since 1981.

All these events are too well known to require further elaboration. There is, however, an important interaction among these shocks. The fall in primary commodity prices *(d)* had the effect of exacerbating the rise in real interest rates *(b)* for debtor developing countries and hence increasing the burden of debt service charges *(e)*. This is illustrated in table 32, which gives the data on nominal interest rates as well as the rate of change of the United States GDP deflator and the unit value of exports of developing countries. The former deflator gives an idea of the real rate facing developed countries. The latter can be a more relevant measure for developing countries, since debt-servicing is done in dollars, which have to be earned from exports. Both in terms of its level and volatility, the real interest rate facing developing countries (net of the rate of change of unit values of exports) is much worse than that facing developed countries. Thus, for developed countries, the real rate went up from 1.33 per cent in 1978 to 7.29 per cent in 1982 and then fell, though not steadily, to 5 per cent by 1985. For developing countries, a real interest rate of 5.73 per cent in 1978 went down to −24.01 per cent in 1980 and then up to 17.69 per cent in 1982, ending at 12.70 per cent in 1985. The real rate, high and volatile, determines the real resource cost of debt servicing. The importance of interest rates to the major debtor developing countries is clearly underscored by the estimate that a 1 per cent fall in the nominal rate reduces the present interest payment of the 15 most heavily indebted developing countries [25] by an estimated $2.5 billion per year.

Given the nature, sequence and timing of the shocks, their impact on the developing countries operates through the external account. A schematic diagram of the process is shown below:

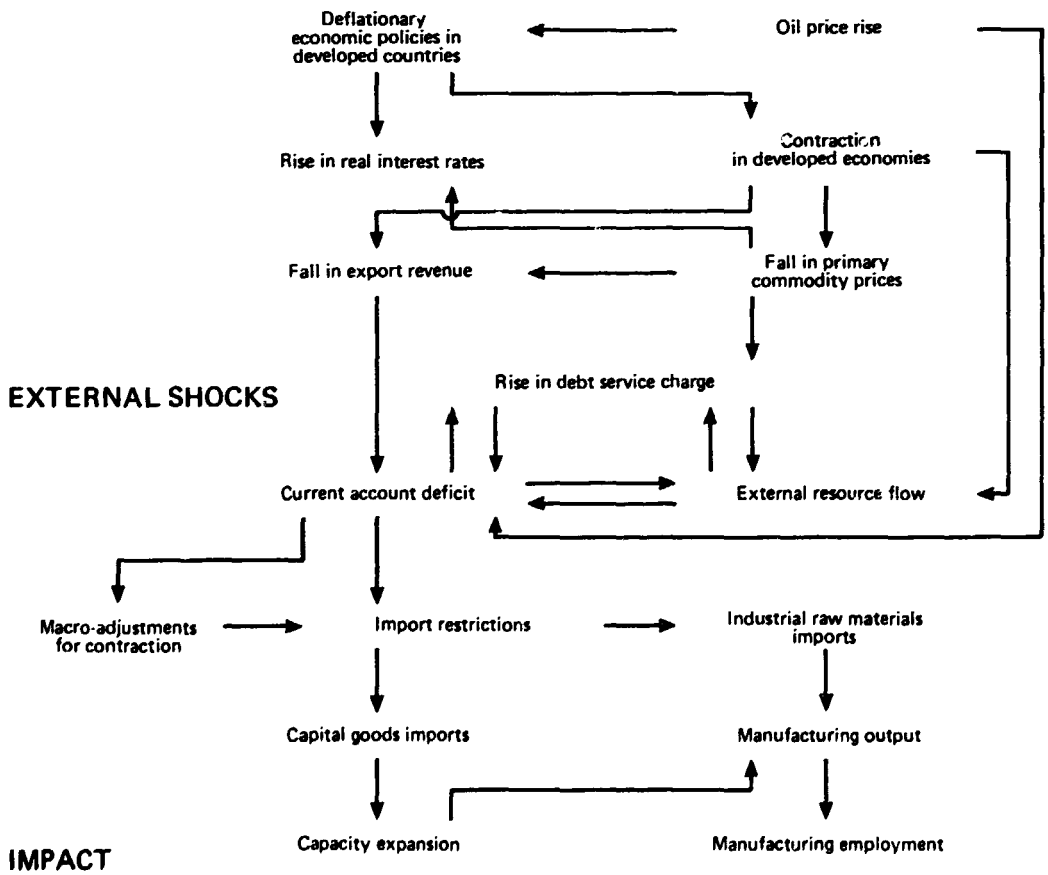


Table 32. Real and nominal interest rates, 1978-1985

(Percentages)

Item	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*
Nominal Euro-dollar rate[a] (three-month)	8.73	11.93	14.19	16.87	13.29	9.72	10.94	8.40
United States GDP deflator	7.40	8.60	9.20	9.60	6.00	3.80	3.80	3.40
Percentage change in export unit value (developing country average)	3.00	29.90	38.20	5.10	−4.40	−7.60	—	−4.30
Real interest rates adjusted for United States GDP deflator	1.33	3.33	4.99	7.27	7.29	5.92	7.14	5.00
Real interest rates adjusted for export unit value	5.73	−17.97	−24.01	11.77	17.69	17.32	10.94	12.70

Source: International Monetary Fund [26].

[a]The average daily quotation on three-month deposits.

An attempt will now be made to analyse and quantify, step by step, each of the variables identified above and its linkages with other variables, using data assembled for 20 developing countries, and to arrive at some estimates of the magnitude of adjustment costs to external shocks imposed on the manufacturing sector in developing countries.

The analytical framework outlined above is obviously over-simplified, and many variables that may have an important bearing on the manufacturing sector are omitted from the flow diagram. The missing variables include macro-economic policy variables such as foreign exchange régimes, monetary and fiscal policies affecting domestic interest rates and government deficits, sectoral pricing policies (for example, depressed agricultural prices), and a host of institutional factors relating to financial and capital markets and domestic resource mobilization. But a certain abstraction from the complex reality is necessary in any such investigation. In this instance, the effect of the so-called "import strangulation" through a foreign exchange squeeze on capacity expansion and output growth is considered to be the most critical element in assessing the consequences of external shocks for the manufacturing sector. This view is justified by a consensus emerging from the recent controversy about the relative importance of the external environment versus domestic factors, and the convergence of views that external shocks play a more dominant role in the payment difficulties of developing countries than internal factors ([27], [28], [29], [30]).

The vulnerability of developing countries to various external shocks differs remarkably from one country to another, given the diversity in the resource endowments, stages of industrialization, economic structure, the composition of trade and external payments position of developing countries. But one dominant factor that influences the extent of vulnerability to external shocks is the openness of the economy. For instance, the economies of China and India had limited exposure to external shocks and faced only modest adjustment problems because of the relative insignificance of their international trade. The analysis contained in this chapter points to the limited consequences of external shocks for manufacturing output and capacity expansion in India as compared with other developing countries. However, once the shock is transmitted from whatever external source (such as falling commodity prices or escalating interest rates), its consequences are invariably felt *ex post* in the worsening of current account balances, which in turn affects external borrowing requirements and the debt-servicing burden. In short, different types of external shocks produce the same effect or symptoms in the form of deteriorating external payments position and the consequent foreign exchange squeeze.

More importantly, many developing countries have been forced to sharply reduce imports of industrial intermediate goods and capital goods in response to mounting current account deficits. Because of the embryonic stage of development and the high degree of import dependence of capital goods and basic goods industries in most developing countries, a reduction in import capacity tends to depress manufacturing output through three distinct routes. On the supply side, restrictions in imports of machinery and equipment reduce the rate of expansion of productive capacity. In a similar vein, cutbacks in imports of essential industrial supplies and parts contribute to capacity underutilization and often cause total disruption of production. Reduced investment also leads to a lower level of effective demand and lower output through the operation of the multiplier mechanism (especially in the case of consumer goods industries serving domestic markets), and hence constitutes a constraint on the demand side.

2. Transmission of the shocks

The initial effects of external shocks are felt on the current account of developing countries. It is generally estimated that each percentage-point drop in the growth rate of industrial production in developed countries leads to a two-percentage-point decline in primary product prices. But the slow-down in growth also affects the demand for manufactured exports from the South to the North. This effect is stronger for manufactured exports than for primary products. Thus, when the real GNP growth rate in developed countries slowed from 3.5 per cent in 1979 to 1.5 per

cent during the 1980-1982 recession, the growth rate of the value of exports from the non-oil-producing developing countries fell from 24 per cent in 1980 to 4 per cent in 1981 and −3 per cent in 1982 [26]. One component of the current account deficit was, therefore, slower growth in export earnings. The situation becomes worse if it is accompanied by the deteriorating terms of trade. Imports are unlikely to decline in value unless a drastic deflationary policy is pursued, while the current account deficit leads to an accumulation of foreign debt. The burden of debt servicing becomes heavier with a rise in real interest rates caused by falling commodity prices, as described earlier.

The recent developments leading to globalization of financial markets seem to have had a stronger impact than the trends in trade. As international capital flows became privatized, there was also a growth in the volume of commercial bank lending to the third world in the 1970s. This has been a mixed blessing. For one thing, although private flows were more buoyant than official flows of credit, access to credit is uneven and more difficult for countries that are small, poor and specialized in exports of primary products. Besides, the privatization of capital markets renders capital flows pro-cyclical rather than counter-cyclical. The chance that public capital flows may fill the gap has been reduced by the very forces that have strengthened the privatization and growth of capital markets. The result is that any particular shock is magnified in its impact as it is fed by other shocks and responses to the shocks. This process of amplification is illustrated by the recession of 1980-1982, which led to the debt crisis of 1982 and a consequent drying-up if not reversal of capital flows from the North to the South.

The growing trend towards trade liberalization in developing countries, even if it is intended to improve the micro-economic efficiency of their economic structure, can contribute to this process as capital markets become tighter. The extent of exposure to international financial markets has been a crucial factor in facilitating or impeding industrialization in developing countries. For instance, when an economy is open to international capital markets, an expectation of national currency devaluation can quickly lead to capital flight. Existing estimates suggest that at least one out of every three dollars of gross external borrowing by eight major debtor developing countries dissipated during the period 1974-1982 through capital flight* ([31], [32], [33]).

*The tables below provide more detailed estimates of capital flight by countries.

Capital outflow as percentage of change in gross external debt in some developing countries, 1974-1982

Country	*Estimate 1*[a]	*Estimate 2*[b]
Argentina	62.0	47.0
Brazil	12.2	0
Chile	0	−1.3[c]
Mexico	44.4	40.0
Peru	29.0	11.0
Philippines	19.6	. . .
Republic of Korea	17.6	2.0
Venezuela	94.4	40.0

[a]Based on Dooley and others [31].

[b]Based on Cuddington [32].

[c]Capital inflow.

When an economy is financially vulnerable, with a high level of external debt relative to export revenue, the debt-servicing burden can impose a considerable constraint on the use of external resources for domestic investment. This constraint is further tightened as the percentage of floating-rate loans in total loans increases or the maturity periods of loans are shortened.

The transmission of an external shock through financial exposure can produce a vicious circle of cumulative imbalances in two interrelated ways. Suppose that there is a sudden rise in the rate of interest on external debt or a deterioration in the terms of trade. This unfavourable development immediately manifests itself in the worsening of the current account balance due to a corresponding increase in debt servicing in the former and a drop in export revenues in the latter case, other things being equal. Additional external borrowing may then be needed to finance a bigger current account deficit, which in turn would lead to greater debt-servicing requirements and again to a larger payments deficit. Thus the vicious circle may continue. The vicious circle of cumulative imbalances may operate in another direction. The deteriorating current account deficits may call for devaluation, which spurs currency speculation and capital flights. This, in turn, further aggravates the current account deficit, often forcing such a country to introduce another round of devaluation, with destabilizing currency speculation, capital flight and further pressure on the current account balance. The process of cumulative disequilibria could go on.

No matter what route the process of cumulative disequilibria may take, it is likely to have an adverse effect on capacity expansion and economic growth. An increasingly larger proportion of external resources will be claimed by debt-servicing requirements, and an ever-diminishing proportion will be available for imports of machinery and equipment for manufacturing investment, once the downward spiral starts. Figure XV provides some empirical evidence of this for 12 developing countries.

The table below provides Morgan Guaranty Trust estimates of net capital flight from various countries.

Net capital flight
(Billions of dollars)

Country	*1976-1982*	*1983-1985*	*Total*
Argentina	−27	+1	−26
Brazil	−3	−7	−10
Chile	0	+1	+1
Ecuador	−1	−1	−2
India	−6	−6	−12
Indonesia	−6	+1	−5
Malaysia	−8	−4	−12
Mexico	−36	−17	−53
Nigeria	−7	−3	−10
Philippines	−7	−3	−10
Republic of Korea	−6	−4	−12
South Africa	−13	−4	−17
Thailand	+1	−1	0
Venezuela	−25	−6	−30

Notes: Plus sign indicates capital inflow. Net capital flight is estimated as the sum of the current account balance (surplus positive, deficit negative) and the change in external debt (increase positive, decrease negative). See *The Economist*, 14 March 1987, p. 56.

Figure XV. Debt servicing versus manufacturing investment

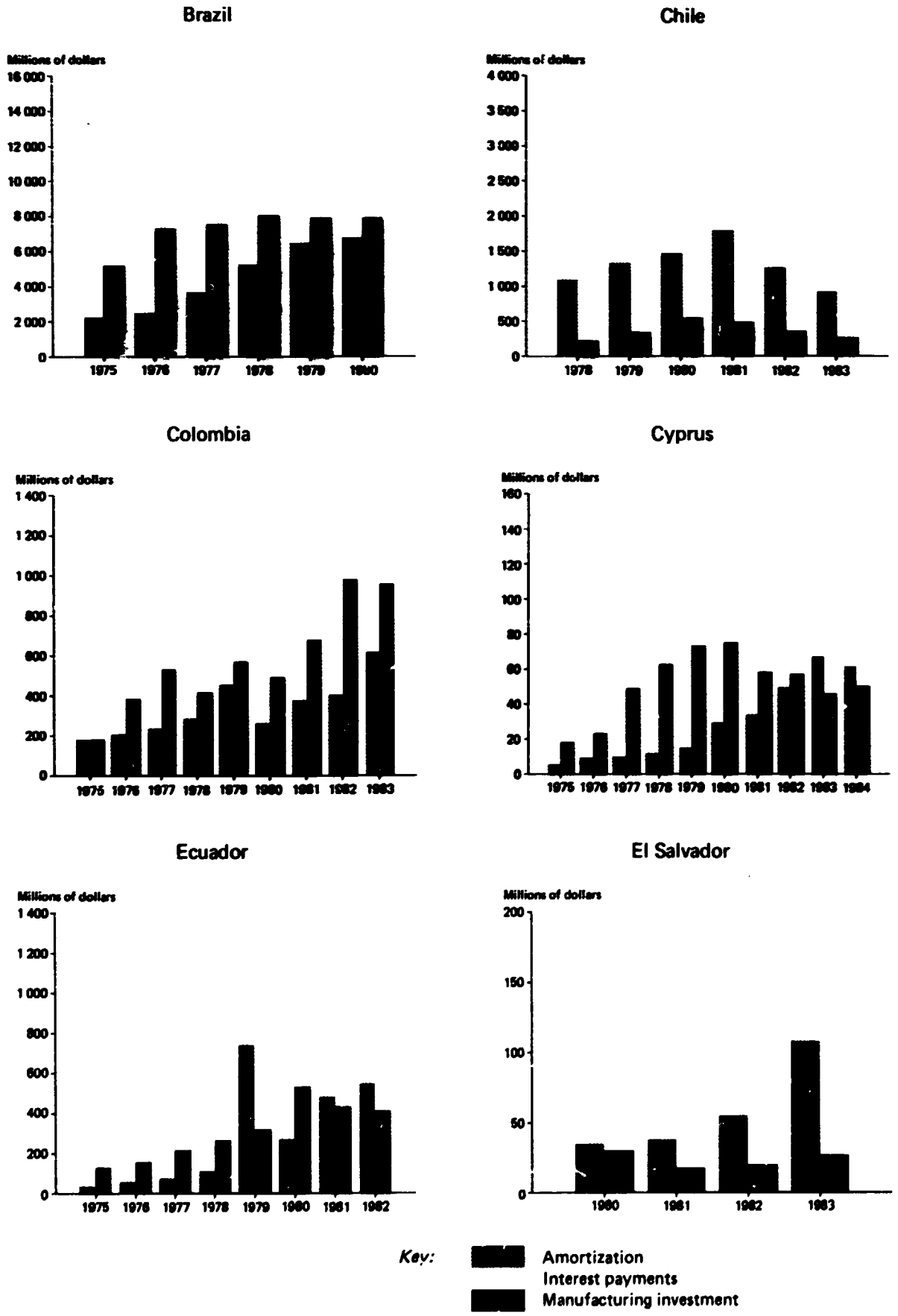
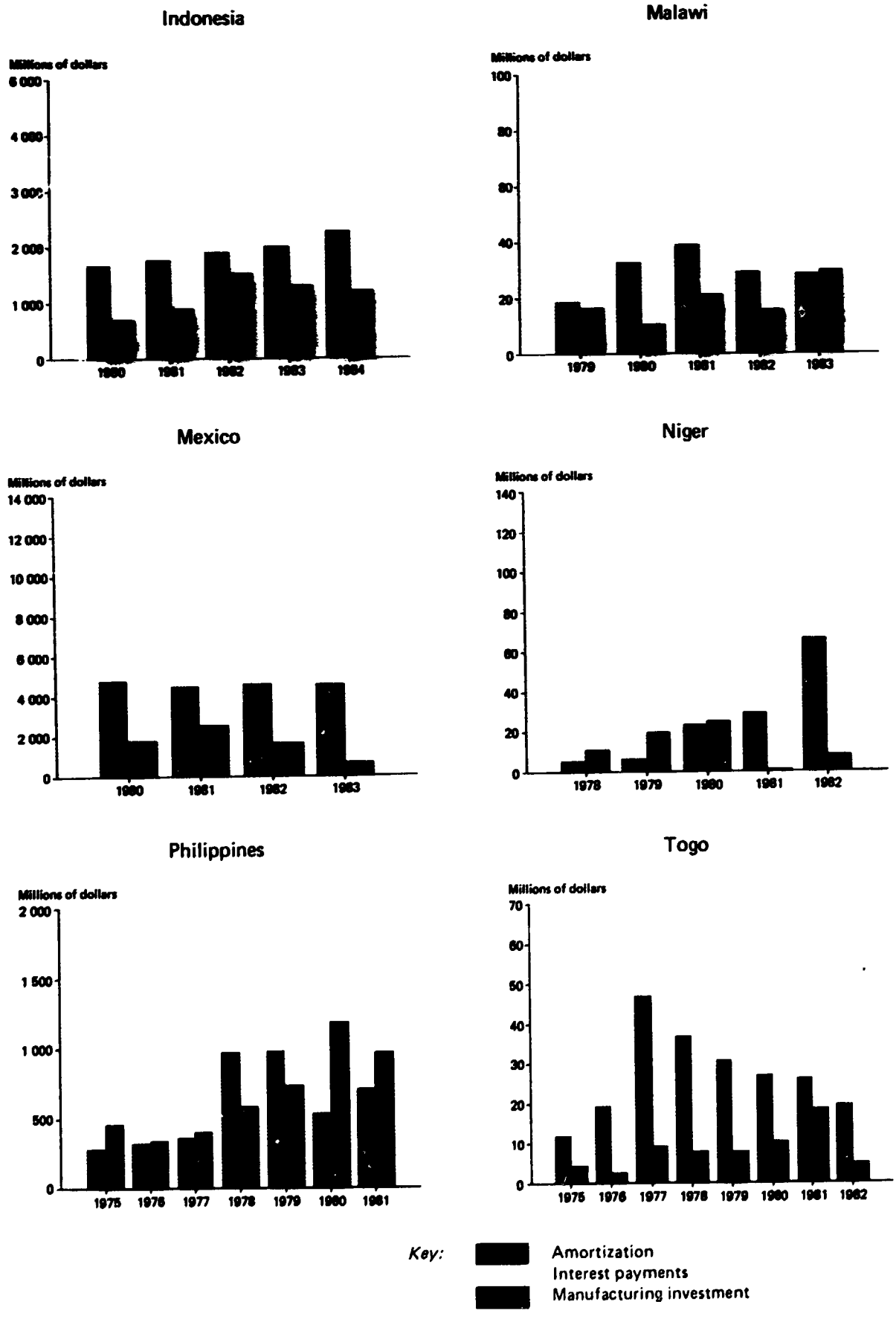


Figure XV *(continued)*



Sources: Debt servicing data from the World Bank, *World Debt Table* various issues, manufacturing investment data from UNIDO data base.

C. Current account deficits, capital flows and manufacturing investment

Figure XVI traces capital inflows, current account deficits and manufacturing investment for 18 developing countries. The capital inflow is broken down into the three components: gross borrowing (disbursement of long-term and medium-term loans); net borrowing (disbursement minus principal payments); and net transfers (net borrowing minus interest payments). A cross-country comparison of these flows suggests the following:

(a) The current account balance in most of the sample developing countries remained negative in 1980-1985, reaching a trough during the 1980-1982 recession. As a result, external capital inflows to these countries had to increase to counterbalance such deficits;

(b) In many developing countries the current account balance considerably improved after the 1980-1982 recession, albeit remaining on the deficit side. But this apparent reduction of current account deficits reflected the diminished availability of financing to cover current deficits, and much of the improvement was brought about by drastic cutbacks in various imports, particularly industrial supplies and capital goods. The improvement of current account deficits at the expense of imports was particularly evident in Latin American heavy-debtor countries;

(c) Following the Mexican debt crisis of 1982, voluntary lending from commercial banks practically ceased, mainly because of the fears aroused by the severe debt-servicing difficulties of a number of debtor countries. External resource flows to developing countries therefore fell markedly after 1982;

(d) While the share of debt servicing in gross borrowing was highest in Latin American countries because of their heavy exposure to commercial loans with variable interest rates, the opposite was observed in most developing African countries with the exception of Malawi. The reason is obvious: most African countries were not creditworthy enough to have access to commercial borrowing and depended largely on official development assistance offered in concessionary terms, which has been stagnating in real terms since 1980;

(e) In general, net transfers and manufacturing investment tended to move in the same direction, suggesting external borrowing as an important source of investment financing. This fairly close relationship between net transfers and manufacturing investment did not hold, however, for a number of countries, partly because some of the net transfer was used for purposes other than manufacturing investment, such as excess consumption and investment in other sectors of the economy (for example agriculture and infrastructure), and partly because many developing countries financed their manufacturing investment from other primary sources such as direct foreign investment (Singapore, Tunisia), official development assistance (Egypt, India, Turkey), domestic resources (India, the Republic of Korea) or oil revenues (Venezuela);

(f) In many developing countries, new gross borrowings have not been sufficient to cover outflows of interest and repayments of principal, still less to reduce the current account deficit.

D. Import squeeze, capital formation and output growth in the manufacturing sector

1. Imports of capital goods

Negative external shocks almost invariably exacerbate the current account deficits of developing countries, which forces them to reduce imports. A large cutback in imports of capital goods and industrial inputs can in turn have a disproportionately adverse effect on economic growth, as has been well established ([34], [35]). The consequences of an import squeeze on two important product groups—machinery and equipment and industrial intermediate goods—need therefore to be empirically established for the group of 18 countries.

The results summarized in table 33 reflect the pressure of current account deficits on imports of machinery in many developing countries during the first half of the 1980s. Although the statistics are given in current dollars, imports of machinery declined or grew only moderately in most cases, thus pointing to a general downward trend during the period. In real terms, the downward trend is probably far more pronounced, given the recent upsurge in the prices of capital goods.

A comparison of the time-series data on imports of machinery and manufacturing investment in developing countries during the 1978-1984 period shows the variables tending to move together fairly closely in most cases, thus underscoring the crucial importance of capital goods imports in domestic capital formation in these countries. The link between the two variables has been confirmed to be statistically significant in a regression analysis using pooled time-series and cross-section data.*

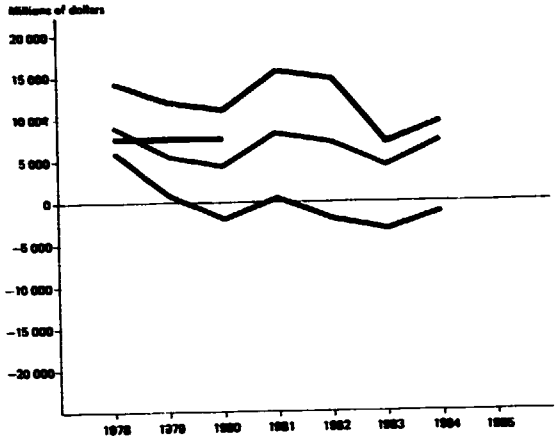
Apart from the long-term supply impact of investment, a reduction in the manufacturing investment caused by shortages of imported complementary machinery and equipment may set off a chain reaction through the operation of the multiplier mechanism, reducing the level of domestic demand and industrial capacity utilization. Lower capacity utilization, in turn, tends to depress investment further through the "acceleration principle", thus slowing down capacity expansion.

The vulnerability of industry to such a sudden import squeeze obviously depends on the degree of import dependence. Generally, the domestic industrial structure of most developing countries is such that they cannot undertake domestic investment without importing complementary capital goods. This import dependence of developing countries is clearly illus-

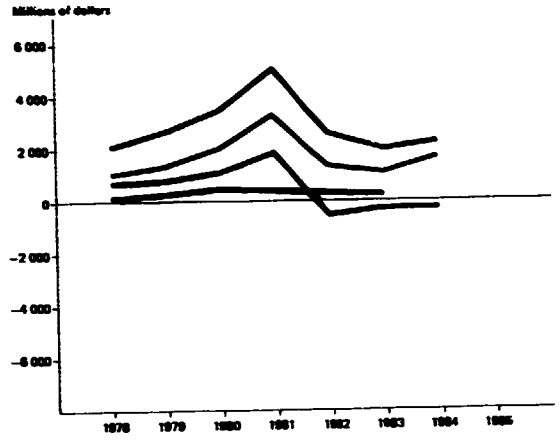
*ln MI = −1.3390 + 1.1334 ln MK
(−4.27) (23.15)
Adjusted R^2 = 0.80, D.W. = 0.179, sample size = 113
MI = Manufacturing investment
MK = Imports of machinery
Numbers in parentheses are t-statistics

Figure XVI. Capital inflows, current account balance and

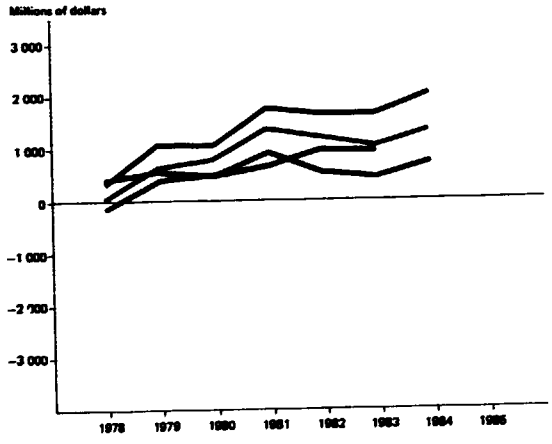
Brazil



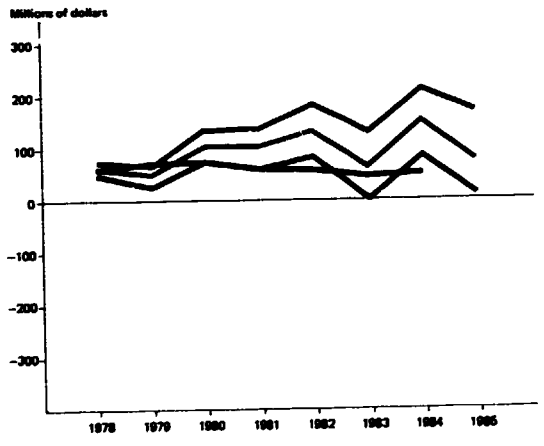
Chile



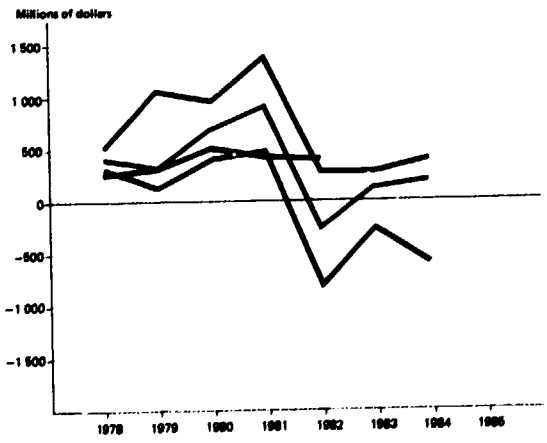
Colombia



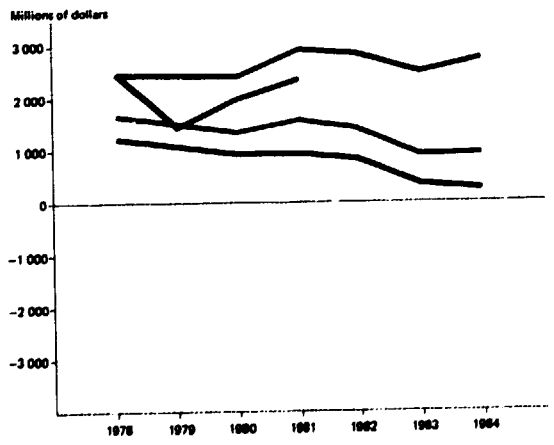
Cyprus



Ecuador

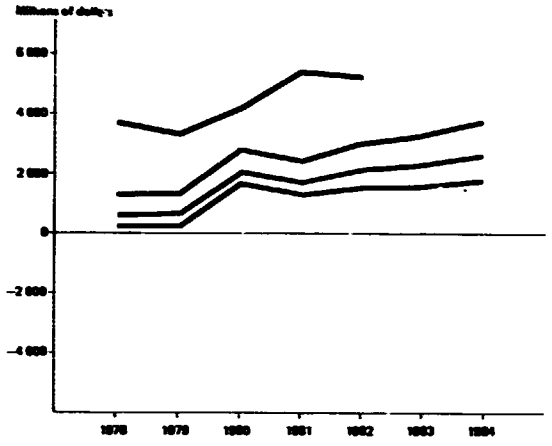


Egypt

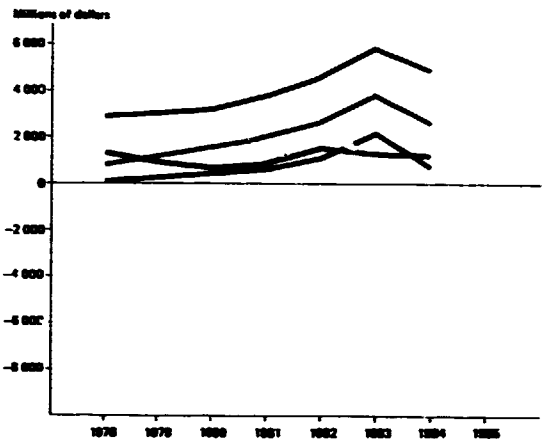


manufacturing investment in various developing countries, 1978-1985

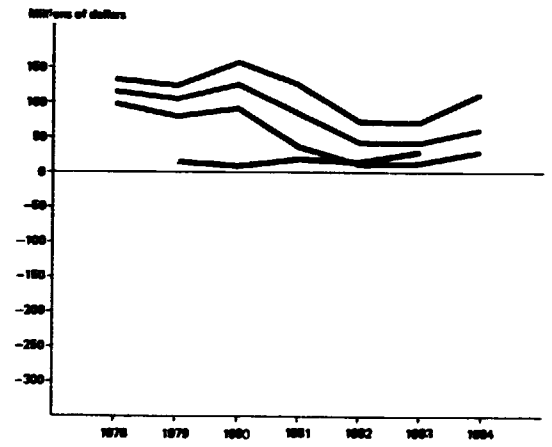
India



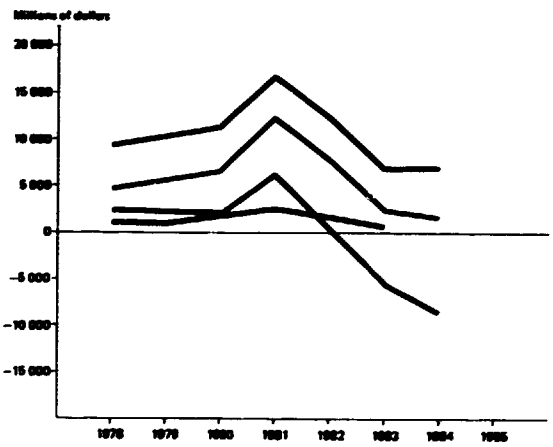
Indonesia



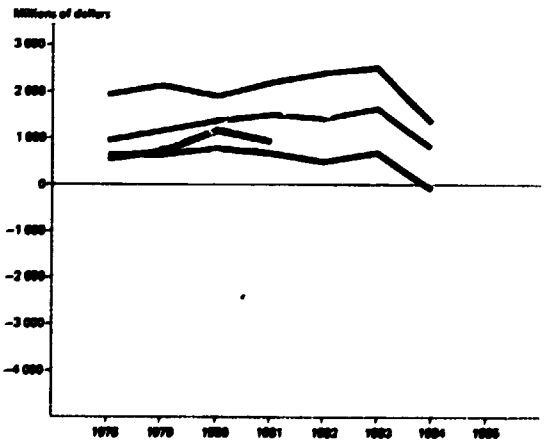
Malawi



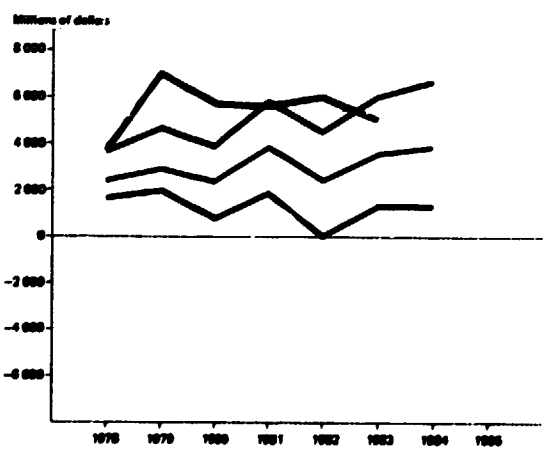
Mexico



Philippines



Republic of Korea

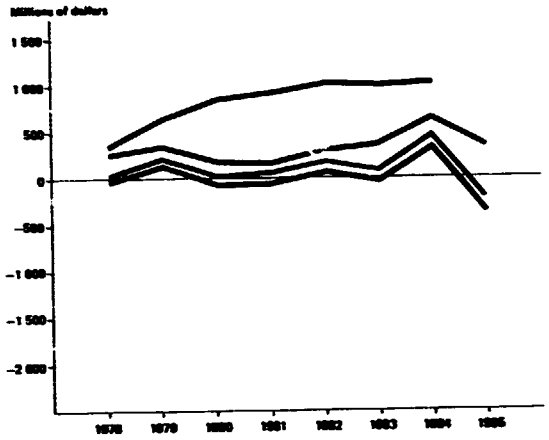


Key:

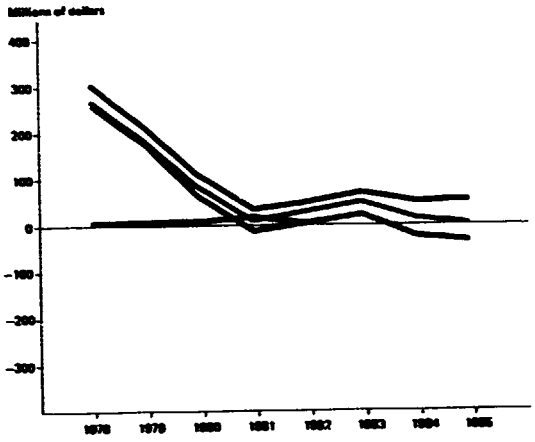
- Gross borrowing
- Net borrowing
- Manufacturing investment, current
- Net transfer
- Current account balance

Figure XVI *(continued)*

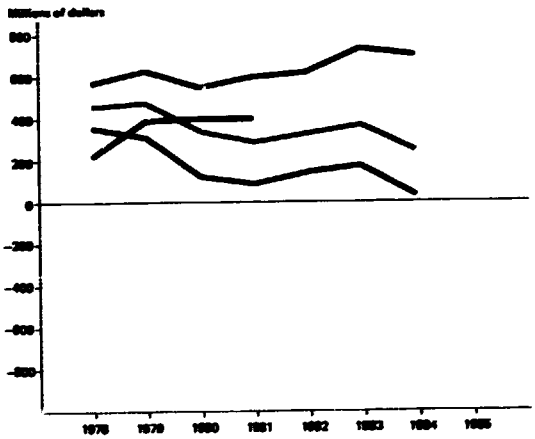
Singapore



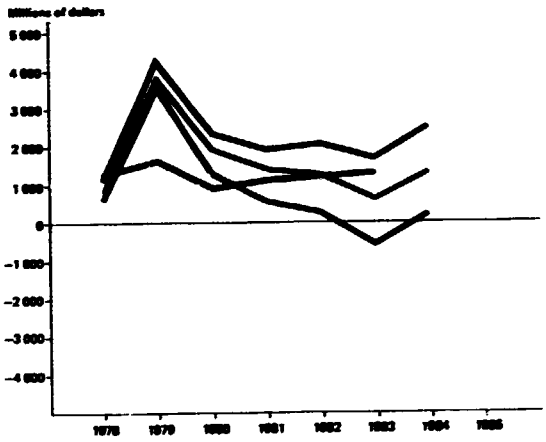
Togo



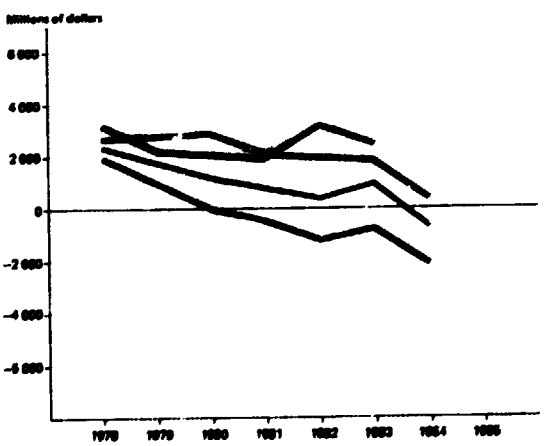
Tunisia



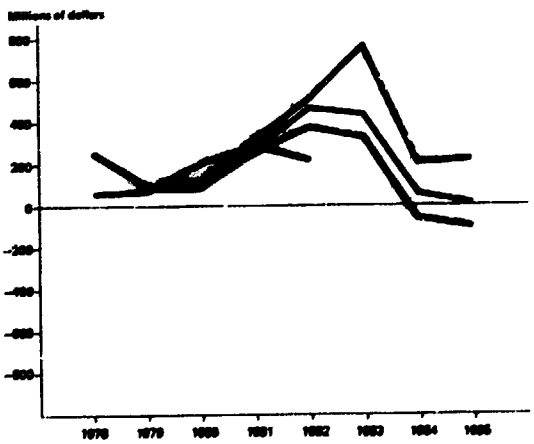
Turkey



Venezuela



Zimbabwe



Key:

- Gross borrowing
- Net borrowing
- Manufacturing investment, current
- Net transfer
- Current account balance

Sources: Capital inflow data from the World Bank, *World Debt Table*, various issues; current account balance from International Monetary Fund, *International Financial Statistics*, various issues; manufacturing investment from UNIDO data base.

Table 33. Annual growth rates of machinery imports of various developing countries

Country	Total imports in millions of current dollars, 1978	Percentage share of total imports, 1978	Annual growth rates (percentages)					
			1979	1980	1981	1982	1983	1984
Latin America								
Brazil	3 387.40	23	9.80	5.40	−4.20	−18.10	−34.50	−13.20
Chile	597.50	20	10.10	22.30	27.40	...	...	...
Colombia	624.00	22	12.40	55.50	18.60	3.70	−3.00	−23.40
Ecuador	496.33	33	...	28.48	3.55	−2.54	...	...
El Salvador	180.22	18	−17.46	−39.88	−9.73	−8.74	...	...
Mexico	2 110.16	27	71.83	57.26	−26.93	...	...	...
Venezuela	3 240.58	32	−15.57	3.45	3.98	...	...	...
Asia								
India	1 138.88	14	17.55	−0.01	33.22	...	...	...
Indonesia	1 465.11	22	8.64	45.66	32.80	44.54	−2.27	...
Philippines	905.24	18	27.11	16.07	−6.00	12.44	−5.04	...
Republic of Korea	3 668.12	25	32.52	−24.79	14.37	4.98	...	...
Singapore	2 518.35	19	40.82	31.04	20.00	3.54	0.94	11.82
North Africa and Western Asia								
Cyprus	105.36	14	21.64	6.93	−9.02	13.08	−9.20	5.46
Egypt	1 365.53	20	−46.04	12.14	72.25	8.44	...	...
Kuwait	933.35	20	−15.26	−65.19	32.84	29.09	...	...
Tunisia	523.17	24	3.99	−0.81	28.85	6.02	−13.33	3.72
Turkey	1 053.17	23	12.84	−4.86	44.57	6.46	...	...
Tropical Africa								
Senegal	121.75	16	7.86	13.76	−37.20	...	...	...

Source: United Nations [36].

trated by the sharp divergence between developed and developing countries in the Pacific Basin region in the domestic share of inputs into capital formation as summarized in table 34. Not surprisingly, the shares of domestically produced capital goods in the manufacturing sector were generally very low for developing countries: 28 per cent for the Philippines, 32 per cent for Thailand, 35 per cent for Malaysia, 40 per cent for Singapore and the Republic of Korea and 44 per cent for Indonesia. This contrasts with a high domestic self-sufficiency ratio of 95 per cent for Japan and 90 per cent for the United States.

2. *Imports of industrial raw materials*

The reduction of imports of industrial raw materials can cause capacity underutilization and even production disruption in the manufacturing sector. The so-called "supply-side industrial vulnerability" to an external shock depends most critically on the degree of vertical integration of domestic basic industries supplying industrial raw materials to other industries. These basic industries, such as industrial chemicals, iron and steel, and energy, are usually characterized by high indices of 'forward linkage", providing

Table 34. Manufacturing contribution to gross domestic fixed capital formation by sources of supply in Pacific Basin countries

Country	Total (thousands of dollars)	Domestic		Japan		United States		Other Asian developing countries[a]		Rest of the world	
		10⁶ dollars	Percentage of total	10⁶ dollars	Percentage of total	10⁶ dollars	Percentage of total	10⁶ dollars	Percentage of total	10⁶ dollars	Percentage of total
Indonesia	1 770 918	778 747	43.97	411 815	23.25	193 858	10.95	36 252	2.05	350 246	19.78
Malaysia	891 386	311 350	34.93	147 572	16.56	94 540	10.61	32 418	3.64	305 506	34 27
Philippines	1 148 479	283 677	28.35	325 594	24.70	241 763	21.05	4 535	0.39	292 910	25.50
Republic of Korea	1 850 898	738 445	39.90	609 477	32.93	205 020	11.08	2 772	0.15	295 184	15.95
Singapore	1 292 032	516 512	39.98	172 634	13.36	278 430	21.55	16 503	1.28	307 953	23.83
Thailand	993 966	317 338	31.93	258 515	26.01	28 937	2.91	36 974	3.72	352 202	35.43
Japan	44 022 000	42 025 841	95.46			886 000	2.01	92 000	0.21	1 019 000	2.31
United States	71 740 000	64 011 192	89.23	1 614 000	2.25			138 000	0.19	3 977 000	8.33

Source: Institute of Developing Economies, *International Input-Output Tables for ASEAN Countries, 1975* (Tokyo, 1982).

[a] Indonesia, Malaysia, the Philippines, the Republic of Korea, Singapore and Thailand.

intermediate goods to other industries. The chain of supply linkages obviously becomes vulnerable when basic industries with strong forward linkages are highly dependent on imports of industrial inputs. The initial supply bottleneck in the basic industry caused by an import squeeze can set off a chain reaction of shortages of industrial supplies leading to successive rounds of output contraction in many other industries. The result can be a small saving in foreign exchange but a much larger reduction in industrial output, and often a disproportionate increase in the import bill. The generally high import dependence of basic industries is illustrated by the import requirements of industrial inputs in the Pacific Basin developing countries, as shown in figure XVII. A country survey of Peru later in this chapter also points to the severe depression of the industrial sector caused by import restrictions in recent years. In Peru every dollar of industrial output requires $0.50 worth of imported inputs.

The cumulative downward spiral brought about by an import squeeze can also operate on the demand side. Many industries with high backward linkages, particularly agrofood and light industries require inputs from other industries. When an industry with high backward linkages is forced to curtail production owing to a shortage of imported raw materials, it may also trigger off a chain reaction of demand contraction faced by other supplying industries linked to it.

The results given in table 35 suggest a significant positive correlation between the growth rate of MVA and that of imports of industrial supplies, and support the import strangulation hypothesis described above. The elasticity of manufacturing output (value added) with respect to imported industrial supplies was estimated to be slightly higher than one,* suggesting a roughly proportionate response of the former to the latter and the limited capacity of developing countries to substitute domestic inputs for imported ones.

3. Probable impact of an import squeeze on output and employment

Given the import dependence of both output and capital formation, it follows that an import squeeze caused by an external shock will lead to output loss in the short run. To quantify such shock-induced output loss involved making a few strong assumptions (see appendix I of this chapter). Once output loss has been calculated, the calculation of consequent loss of employment is straightforward. The first question to consider is what would have happened to industrial output and employment if the economies of the sample countries and the world economy had continued to move along the course set during the period before 1980 in terms of new import capacity, the pace of manufacturing investment, capacity utilization and productivity. The calculation does not allow for the possible impact of the import squeeze on the industrial structure, making the structure more or less import dependent. Nor can it accommodate the effects of these changes on the world economy as a whole. These caveats should be borne in mind in interpreting the following results.

On the basis of these assumptions, for each country in the sample group the level of potential output that would have been realized if the rate of capital accumulation observed in the second half of the 1970s had been sustained during the first half of the 1980s will be calculated and compared with the actual performance during the latter period. This was done for four manufacturing industries—the agrofood, light, basic and capital goods industries. Applying the annual average growth rates of cumulative industry investments in the second half of the 1970s given in appendix II, table 42, of this chapter, potential industry output was calculated from a set of statistically estimated manufacturing output-capital relationships for the period 1981-1985 for some 20 developing countries.

The results are summarized in table 36 to facilitate an inter-country comparative assessment. Industry details are given in appendix II of this chapter.

The impact of external shocks measured in terms of potential manufacturing output foregone between 1981 and 1985 differed widely among the countries and areas compared in table 36, ranging from a deficit of $78 billion for Brazil to one of around $0.5 billion for Singapore and a surplus of $0.5 billion for Zimbabwe. In addition to Brazil, among the big losers in absolute terms (based on 1980 dollars) were Colombia ($5 billion), Indonesia ($7.2 billion), India ($10 billion), Mexico ($21.6 billion), Venezuela ($24 billion) and the Republic of Korea ($33.5 billion).

A more relevant measure of the impact cost may be the magnitude of lost output compared with the level of actual output produced. The percentage figures in the table measure the extent to which actual output could have increased if additional investment had been forthcoming at the 1975-1980 annual average growth rate. Bearing in mind the considerable variations between countries in the growth rates of manufacturing capacity in the 1970s, among the countries showing a sizeable gap are Venezuela (45 per cent), the Republic of Korea (37 per cent), Brazil (31 per cent), Tunisia (25 per cent), Ecuador (20 per cent), Indonesia (17 per cent) and Colombia (16 per cent), plus a few small countries like Malawi (54 per cent) and Malta (29 per cent).

It is not difficult to see why these countries have shown relatively large output gaps. All of them, except for Colombia, were forced to decelerate their capital investment substantially during much of the 1975-1980 period (see figure XIII). However, the potential output of the Republic of Korea seems unrealistically high in view of the rapid growth of actual output that it generated at an annual average growth rate of over 10 per cent in the 1981-1985 period. There was, however, a major exception to this general downward trend. A few countries like Singapore (3 per cent) and India (8 per cent) have managed to sustain the momentum of capital accumulation started in the 1970s, since they were relatively unencumbered by the external debt burder and primarily tapping other investment sources such as foreign direct investment

*The regression result involving MVA and the imports of industrial supplies is:

$$\ln MVA = -0.3927 + 1.1392 \ln MIS$$
$$(-0.953) \quad (20.14)$$

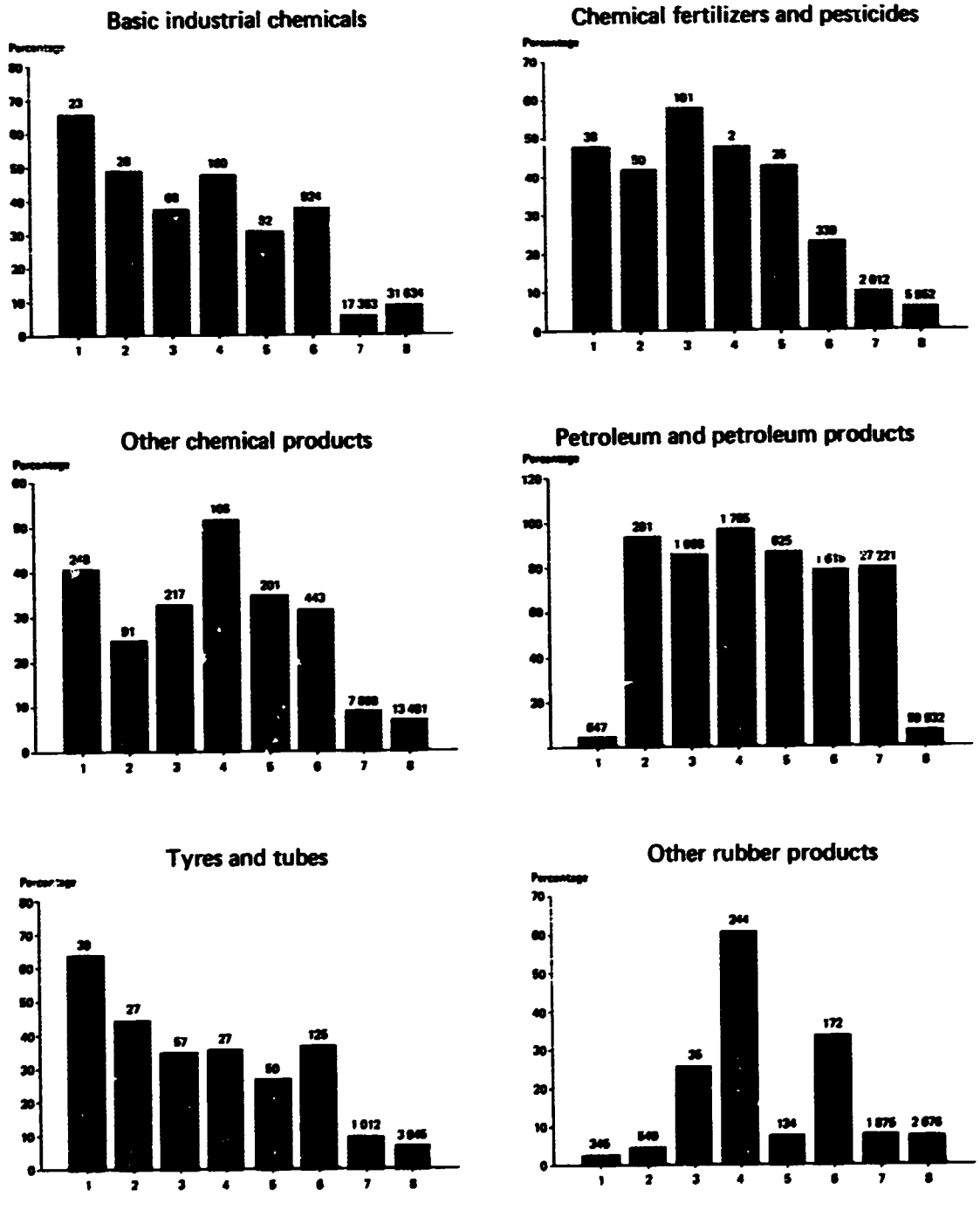
Adjusted $R^2 = 0.75$, D.W. = 0.27, sample size = 126
MVA = Manufacturing value added
MIS = Imports of industrial supplies
Numbers in parentheses are t-statistics

Table 35. Annual growth rates of imports of industrial supplies and MVA in various developing countries

Country	Total imports in millions of current dollars, 1978	Percentage share of total imports, 1978	Annual growth rates (percentages) 1979	1980	1981	1982	1983	1984	1985
Brazil									
BEC 2	4 274.20	29	29.20	22.10	−24.60	−22.90	−26.30	9.48	...
MVA	57 974.40		13.56	9.96	8.85	2.90	−29.42	−1.17	...
Chile									
BEC 2	738.60	25	25.10	24.80	24.80	...	...	...	...
MVA	3 718.27		28.99	36.23	5.97	−22.43	−13.86	5.36	...
Colombia									
BEC 2	1 055.10	37	13.40	36.80	7.40	7.20	−13.80	−1.50	...
MVA	4 774.40		28.97	15.97	5.15	0.45	−0.59	−1.42	−36.27
Cyprus									
BEC 2	263.78	35	48.05	8.60	−6.36	−1.20	−3.11	7.90	...
MVA	240.49		27.40	22.04	−1.53	0.31	−2.97	1.16	...
Ecuador									
BEC 2	519.11	32	...	50.19	−19.62	40.42	...	...	...
MVA	1 113.36		9.92	8.51	14.91	1.31	−3.81	3.92	26.69
Egypt									
BEC 2	2 461.99	37	−38.90	31.17	57.69	8.24	...	...	...
MVA	2 604.60		−35.35	16.63	17.65	21.77	22.70	24.21	21.47
El Salvador									
BEC 2	408.56	40	1.80	−13.52	5.11	−20.69	...	...	...
MVA	514.68		−15.29	2.66	5.81	−4.39	14.73	13.67	...
India									
BEC 2	3 094.62	39	27.81	12.22	19.56	...	...	...	...
MVA	9 909.10		16.91	12.99	6.42	1.55	8.51	1.29	1.51
Indonesia									
BEC 2	2 314.74	35	20.41	40.32	29.63	7.41	−8.11	...	...
MVA	2 750.13		−5.87	70.23	17.36	10.82	−11.03	2.73	0.51
Kuwait									
BEC 2	1 154.05	25	24.00	−67.93	7.68	19.67	...	...	...
MVA	1 055.13		106.20	−15.82	−27.04	10.63	...	...	...
Mexico									
BEC 2	3 114.63	40	43.09	42.57	−32.54	...	...	...	...
MVA	17 356.70		31.72	37.97	24.99	−34.11	−6.06	24.62	11.41
Philippines									
BEC 2	1 671.60	32	25.41	11.99	−12.68	15.98	−4.35	...	...
MVA	3 492.68		30.09	19.93	−8.77	7.73	−13.47	−3.39	
Republic of Korea									
BEC 2	6 393.00	43	35.85	−1.95	8.63	−6.67	...	...	...
MVA	16 926.10		14.16	1.25	15.67	4.59	13.85	13.31	...
Singapore									
BEC 2	3 940.63	30	34.77	23.48	1.88	0.92	0.82	2.40	...
MVA	2 320.05		36.42	28.27	15.46	−5.01	6.37	10.73	...
Senegal									
BEC 2	172.41	23	27.48	−12.89	−19.09	...	...	...	...
MVA	189.35		22.34	10.77	−26.96	2.24	−0.18	−4.42	−12.62
Tunisia									
BEC 2	724.22	33	32.34	−0.83	1.87	−10.12	...	...	...
MVA	630.43		26.90	17.41	−3.82	−4.08	0.92	100.00	...
Turkey									
BEC 2	1 563.66	34	14.35	22.68	18.09	−10.43	...	...	...
MVA	9 891.90		22.74	−21.98	8.58	−6.93	5.62	−0.28	−0.77
Venezuela									
BEC 2	2 985.04	28	3.52	16.37	3.48	...	...	...	...
MVA	9 233.10		30.42	17.69	3.55	7.62	2.20	−27.68	...

Sources: MVA from UNIDO data base. Imports from United Nations [36].

Note: BEC 2: Broad economic category of imports (industrial supplies); MVA: Manufacturing value added.

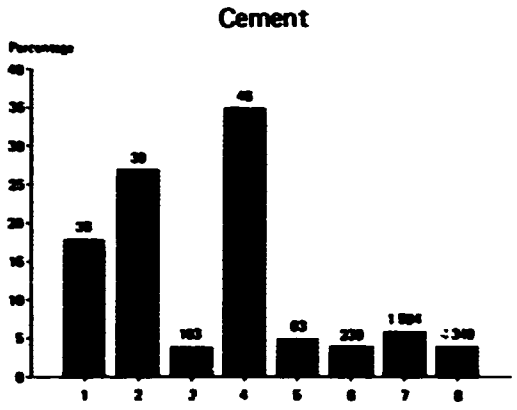


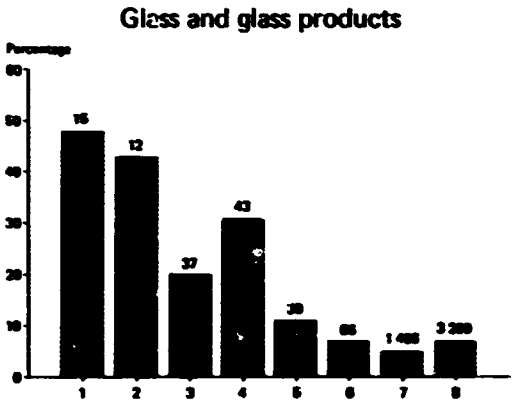
Key:
1 = Indonesia
2 = Malaysia
3 = Philippines
4 = Singapore
5 = Thailand
6 = Republic of Korea
7 = Japan
8 = United States

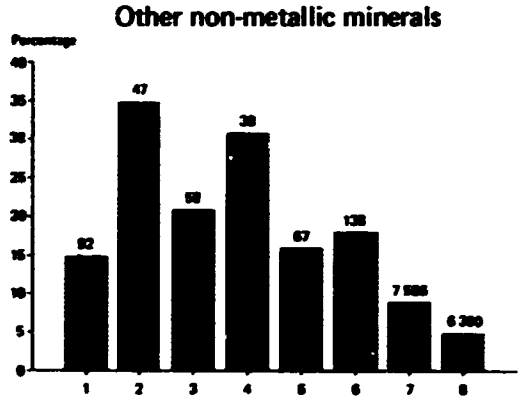
Note: Figures at top of country columns are total input purchases in millions of dollars.

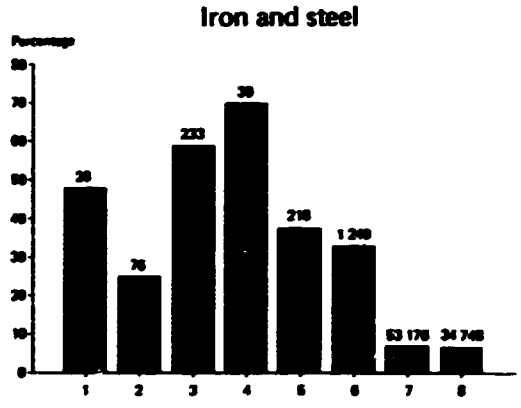
Source: Institute of Developing Economies, *International Input-Output Tables for ASEAN Countries, 1975* (Tokyo, 1982)

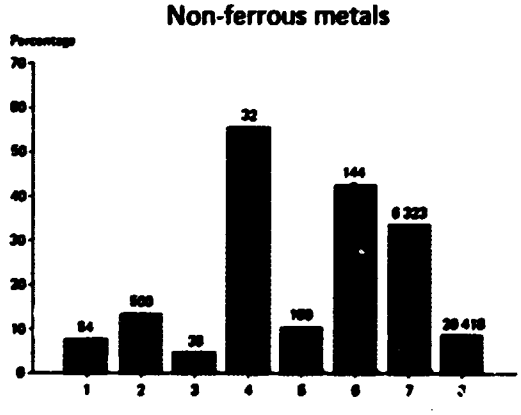
basic industries in selected countries











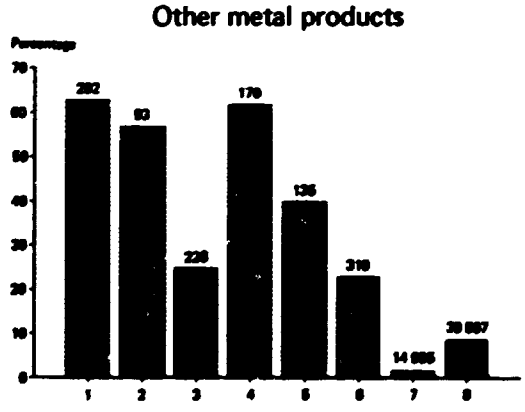


Table 36. Estimated cumulative potential manufacturing output and employment foregone due to external shocks, 1981-1985

Country or area	Total MVA foregone (millions of 1980 dollars)	Percentage[a]	Total employment foregone (thousands of employed)	Percentage[b]
Brazil	78 198	30.6	1 918.7	37.5
Chile	1 930	7.8	21.0	15.5
Colombia	5 169	15.9	207.7	43.8
Cyprus	234	11.7	10.3	26.5
Ecuador	2 038	19.6	52.1	35.1
Egypt	2 313	13.7	488.9	46.0
Hong Kong	2 323	8.5	99.8	11.8
India	9 970	7.7	547.7	7.2
Indonesia	7 182	17.3	300.7	25.6
Kuwait[c]	452	17.7	2.4	7.0
Malawi[d]	406	53.7	1.0	2.5
Malta	487	29.1	3.2	11.6
Mexico	21 558	11.2	421.6	24.4
Philippines	5 427	10.3	662.9	58.0
Republic of Korea	32 542	36.8	498.5	22.5
Singapore	447	2.8	7.4	2.6
Swaziland[c]	-8	-5.5	-0.2	-2.1
Togo[c]	7	5.3	0.3	6.6
Tunisia	1 553	24.7	46.6	29.0
Turkey	7 821	10.1	251.2	26.7
Venezuela	23 984	44.9	405.9	76.8
Zimbabwe	-112	-1.6	-11.8	-6.3

[a]Cumulative potential MVA foregone as a percentage of cumulative actual MVA, 1981-1985.

[b]Cumulative potential employment foregone, 1981-1985, as a percentage of 1985 actual employment.

[c]Cumulative sums, 1981-1982.

[d]Cumulative sums, 1981-1984.

(Singapore) and official development aid and domestic resources (India). As a result, the gap between potential and actual output was relatively small.

A word of caution is needed in the case of Zimbabwe. As described in chapter II of this report, Zimbabwe's surplus resulted not from its improved performance in the post-1980 period over that of 1975-1980, but from its comparatively depressed levels of investment and consequent sluggish growth in manufacturing output in both the pre- and post-1980 periods. In fact, its MVA growth rates were negative during much of the 1975-1985 period, except for 1979-1981 and 1985. Zimbabwe's manufacturing performance seems to have been hampered by both external and internal factors, in particular a foreign exchange squeeze mainly due to falling prices of its major commodity exports, mounting debt burden, rapidly rising government deficits, and huge parastatal enterprise losses.

The output impact of external shocks having been assessed, the next logical step to consider would be the employment implications of the manufacturing output foregone. These results are presented with those of output loss in table 36. Once again industry details are provided in appendix II of this chapter. There are many similarities between the output gap and employment gaps. Some of the most notable findings are as follows:

(a) The ratio of potential manufacturing employment foregone to total actual manufacturing employment varies widely between countries and between years within each country. The countries and areas with a relatively small potential employment gap, for example, less than 5 per cent in any single year, include Brazil, Hong Kong, India, Malta, Singapore and Zimbabwe; those with a relatively large gap of over 20 per cent in any year were the Philippines and Venezuela;

(b) The total accumulated potential manufacturing employment foregone during the 1981-1985 period ranged from 1.9 million in Brazil to almost nil in Singapore and Zimbabwe. Among the big losers measured in thousands of potential jobs, besides Brazil, were: the Philippines (663), India (548), the Republic of Korea (500), Egypt (489), Mexico (421), Venezuela (406) and Indonesia (300) (see table 36);

(c) Measuring the potential employment foregone against the actual employment in 1985 alters the picture considerably, as in the case of the potential output foregone. Some countries ranked high both in absolute and relative measures; Venezuela (77 per cent), the Philippines (58 per cent), Egypt (46 per cent), and Brazil (38 per cent). But figures for others became lower in relative terms: India (7 per cent), the Republic of Korea (23 per cent), Mexico (24 per cent) and Indonesia (26 per cent). The opposite also holds for many countries, namely small losses in absolute terms but large in relative terms. These include Colombia (208,000, 44 per cent), Ecuador (52,000, 35 per cent) and Tunisia (47,000, 29 per cent);

(d) These striking differences in the potential employment gap between countries can be explained by substantial inter-country variations in the size of potential MVA foregone and employment coefficients reflecting different production technologies and employment policies (such as overmanning in Egypt and India). However, the bulk of the potential employment gap appears to be explained by the size of the potential output gap, according to what is known as the "Okun gap" in developed countries.

E. Review of country experiences

The assessment of the economic consequences of external shocks in previous sections has been a quantitative exercise. Only the consequences as summarized in certain economic statistics have been considered. The actual economic experience of responding to such shocks is a much more complex process, which is only partially reflected in the limited data used to draw plausible inferences in statistical excercises. For this reason, the experiences of four countries are briefly described, although to do them full justice would require several volumes.

Before considering the response of individual countries, however, the four principal categories of policy response to external shocks will be summarized. These relate to demand management, structural change, exchange rate policy and external finance. Usually some combination of these would occur ([37], [38]).

Demand management attempts to influence macroeconomic levels of spending of the private and public sectors through monetary and fiscal policy measures. These may include the setting of interest rates and control over lending, the supply of money, rates of taxation and the level of government expenditure. In trying to achieve the "right" balance of such measures, the focus is usually on the so-called "Phillips curve", that is, the levels of inflation and employment.

Structural adjustment consists in supply-side policies aimed at improving resource allocation and efficiency and expansion of productive capacity. Such policies will tend to have a somewhat longer time horizon than does demand management and their focus will be more micro economic. In a static sense, adjustment will consist in measures to improve both efficiency and the existing allocation of resources and to move resources into sectors where their economic return is high. Thus, adjustment will consist in policies to reduce price distortions, which may be created by a policy itself, such as price control or very high and variable protection from imports. In a more dynamic sense, adjustment will consist in measures to encourage investment in industries likely to have high returns (picking winners), to increase the use of existing production capacities in those industries and to induce improvements in technology, management and skills.

During a period of external shock, establishing the right foreign exchange rate becomes both especially important and difficult. If set incorrectly, it can make demand management much more difficult. Unfortunately, no widely accepted theory of how to set a target exchange rate exists at present. Trial and error seems to be the rule in practice, particularly now that relative values of the major trading currencies seem so uncertain.

External finance provides a bridge between demand management and exchange rate policy. The accumulation of foreign debt can be a positive influence on economic development so long as the investment return exceeds the cost of borrowing. However, the experience of most current debtor countries, when in the late 1970s they rapidly accumulated debt at very low or negative real interest rates, shows how important it is to adopt a conservative stance. in retrospect it seems clear that borrowing at such interest rates could only be a temporary phenomenon.

1. Peru: from stabilization to Keynesianism

The Peruvian economy grew at an average annual rate of around 3 per cent during the 1970s.* A relatively high GDP growth rate of 4.3 per cent was achieved during 1970-1975, but growth declined in the late 1970s. Industrial development in this period was mainly driven by import-substituting industrialization, which was promoted within a policy framework that was highly selective for individual industries according to their priority status. Basic industries in the public sector producing intermediate goods from Peru's natural resources formed the core of industrial expansion during this period, whereas light industries serving domestic basic needs (such as clothing, footwear and furniture) and strategic branches with long-term growth prospects (such as engineering industries) showed little dynamism.

In the second half of the 1970s, growth slowed down for various reasons ([39], [40]). Public investment, formerly a major driving force, had exceeded the real resources available to the Government, and its expansion had to be reduced. In addition, the structure and nature of the investment itself contributed to the declining growth rates. Public investment activities were predominantly confined to projects in industries that had been given long-term development priority, for example oil, fishing, mining, basic industries and infrastructure. In addition, structural imbalances emerged between supply and demand, and import reduction objectives were unmet. Import-substituting industrialization policies encountered increasing difficulties and contributed to a stagnation in export sales. In 1977 the economy entered a two-year recession followed by a three-year recovery, which, however, in its third year could only be maintained thanks to the recovery of the agricultural sector. In response to these negative trends in the second half of the 1970s, the Government in 1979 initiated steps towards liberalizing the economy ([41], [42]). Yet fundamental changes in this direction were not undertaken until a new Government took office in 1980. High tariffs and, more importantly, extensive non-tariff barriers put up during the 1970s were drastically reduced. In fact, the non-tariff barriers were almost completely removed in 1980, and the protection of domestic industry was based on a rationalized system of *ad valorem* tariffs more in conformity with a market economy system. However, trade liberalization was not accompanied by a corresponding relaxation of internal policy rigidities, and an appreciation of the Peruvian currency in the early 1980s aggravated the impact of the liberalization programme.

It was against this background that the external shocks of the early 1980s made their impact. The reduced demand on the world market for Peru's traditional exports, particularly copper, silver, lead and zinc, hit the economy sharply. In 1982, international copper prices fell in real terms to a 30-year low, lead prices fell by 26 per cent, and the price of refined silver fell by over 30 per cent. As a result, the terms of trade declined from 130 in 1980 (1970 = 100) to 95 in 1983 and 82 in 1984. Thus, external shocks reinforced

*For a review of Peru's industrial performance during the 1970s, see "Industrial restructuring in Peru: policies for growth and development" (UNIDO/IS. 614), pp. 1-18.

the negative impact of a speedy liberalization programme in 1980 and of an appreciating real exchange rate on the economy and particularly the industrial sector. In 1981 and 1982 trade deficits of $553 million and $557 million, respectively, were recorded, compared with trade surpluses of $837 million in 1980 and $1.5 billion in 1979. The Government agreed with the IMF on a stabilization programme and received assistance from the IMF compensatory financing and extended fund facilities (1982).

'n 1983 Peru entered into its most severe recession in recent history. GDP declined by about 12 per cent within one year, as the general economic depression was aggravated by major crop failures due to adverse climatic conditions. Manufacturing activities were particularly hard hit and dropped by more than 17 per cent. To counter this, the Government departed from targets agreed upon with the IMF, and initiated in August 1983 an emergency package that included a slow-down in the monthly rate of devaluation, a reduction in the controlled prices for basic food commodities and fuel utilities, increased trade barriers and an abandonment of the 4.1 per cent target set for the public sector deficit by the IMF.

The depressed domestic demand allowed a significant improvement of the trade balance which registered a surplus of $293 million in 1983 and $452 million in 1984, compared with a deficit of $557 million in 1982. This improvement was due to a significant increase in exports (mainly non-traditional) in 1983 and a sharp fall in imports. This fall, however, reinforced the depression of the industrial sector, since every $1 of industrial output required $0.50 of imported inputs. In addition, the positive development of the trade balance could not prevent the balance of payments from becoming negative, due to heavy outflows of short-term capital in the form of refinancing and repayment of commercial credits. As a result of a further reduction of imports by 21 per cent and an increase in exports by 4.4 per cent, the balance-of-payments surplus (current account) increased from $40 million in 1983 to $248 million in 1984. The increased exports, the rescheduling of part of the foreign debt and the falling into arrears on some of the obligations reduced Peru's effective ratio of debt service to exports (excluding refinanced service) from 19.5 per cent in 1983 to 16.4 per cent in 1984.

In February 1984, Peru and the IMF signed a letter of intent for a new 18-month stand-by facility worth 250 million units of special drawing rights (SDRs). Yet the third payment of $100 million due in September 1984 was suspended when Peru failed to comply with the IMF targets. For instance, the share of the public deficit in GDP, targeted at 4.1 per cent in the agreement, approached some 11 per cent in 1984, while inflation reached 111 per cent in the same year. Yet the more expansionary measures adopted in this period allowed the Peruvian economy to grow by around 3 per cent in 1984. However, this recovery was mainly due to a recovery of agriculture, whereas manufacturing remained in depression. As a result of the economic crisis during the early 1980s, Peru experienced a "reversed" pattern of structural change, in which the share of manufacturing in GDP dropped from 25.1 per cent in 1980 (which was already below the maximum share of 26.6 per cent achieved in 1976) to 21 per cent in 1984, whereas the share of agriculture increased from its minimum of 11.8 per cent in 1980 to around 14 per cent in 1984.

In the first half of 1985 inflation accelerated to a rate of 130 per cent, and external debt reached $13 billion. The general elections in April resulted in a change of Government and a new administration took office. The new team's approach to coping with the continuing crisis of the economy and particularly of industry differed significantly from the measures taken by the previous Government. After a 60-day emergency austerity programme introducing a price freeze, which was inspired by the Austral Plan introduced in Argentina, the Government took far-reaching measures to stimulate domestic demand while maintaining the price freeze. Incomes of employees were boosted through the removal of a payroll tax of 2 per cent paid equally by employers and employees. Peru's 800,000 public sector employees were given a $71 million interest-free loan that was deductible over 15 months. To compensate for this increase in public spending, banks, financial institutions, insurance companies and mining companies were obliged to buy certificates of deposit equal to 40 per cent of their 1984 profits [43]. Perhaps even more effective in stimulating domestic demand were measures aimed at providing income to the large number of unemployed and underemployed Peruvians. Several programmes were implemented to achieve this objective. A programme of "temporary employment" provided wage support to new recruitment for a limited period. Public work programmes directly absorbed great numbers of urban unemployed, and self-employed persons in the informal sector (mainly street vendors) were given low- or zero-interest loans. In support of this demand stimulation, measures were taken to encourage investment and production. Interest rates were reduced, public procurement was to favour Peruvian goods, factories were allowed to operate four shifts instead of three, rigidities in labour legislation unfavourable to industry were removed, and $25 million were made available for financing essential imports. Agricultural producers in "depressed zones" received zero-interest loans from the Agricultural Bank. In the external sector, the exchange rate was frozen until the end of 1986 to complement the internal price freeze, the import régime was further tightened, and Peru's public debt service was limited to 10 per cent of the country's export receipts. In early 1986, new demand stimuli were added through a reduction of the sales tax from 11 per cent to 6 per cent, a reduction of fuel prices and an increase of minimum wages by 30 per cent. In mid-1986 also, the debt service of the private sector was included in the global 10 per cent export share ceiling, and in reaction to Peru's increasing debt arrears the IMF declared Peru no longer credit-worthy in August 1986.

Despite this, the basically Keynesian, demand-oriented approach taken by the new administration, supported by freezes of internal prices and the exchange rate, showed remarkable results in 1986. After a very moderate growth of 1.5 per cent in 1985, the Peruvian economy expanded by 8.5 per cent in 1986. Manufacturing industry was the growth leader, surging by around 14 per cent, with light industries serving domestic final demand showing the strongest growth performance. Yet, at the end of 1986 the

Peruvian economy, the growth momentum of which was sustained by the utilization of significant excess capacities built up during the preceding recessionary years, showed signs of weakness, particularly in the external sector. Exports suffered from both the frozen exchange rate and the strong domestic demand, and fell by 16 per cent in value terms. As imports recovered from their low level of 1985 and grew by 32 per cent, the trade balance surplus, which had been more than $1 billion in 1984 and 1985, disappeared and the global balance became negative again, after having shown surpluses in the two preceding years.

In December 1986 the Government initiated adjustments to counter this trend [44]. The internal price freeze was replaced by a more flexible system of price controls, and the Central Bank announced a monthly devaluation of the currency by 2.2 per cent throughout 1987. The Government expects an overall economic growth of 6 per cent in 1987. Yet, unlike in 1986, the achievement of this objective will require significant amounts of investment to meet growing domestic demand and to increase the international competitiveness of industry. Since the foreign investment and bank loans, which have traditionally led the country's growth cycles, are no longer available, an innovative scheme is needed to secure part of the needed foreign exchange. The so-called circuit programme includes a device to make inti deposits (which have traditionally been kept cheaper than the inflation rate) more attractive than dollars as a means of saving and to utilize them for domestic productive investment. Government bonds in inti are placed on the market, carrying an interest rate substantially higher than dollar deposits abroad and thus remaining "competitive but not convertible". The scheme aims for inflation to be kept down to 40 per cent per annum, for an increase in wage rates to be restrained to 45-48 per cent, and for devaluation to be around 25 per cent—slower than the inflation rate in order to keep dollars in the country. Investment in new production, with emphasis on export-oriented ventures, is to be spurred by subsidies and other incentives to private enterprises. Detailed negotiations between the Government and the major industrial and financial groups have been under way. Whether policy reforms initiated in late 1986 and early 1987 are sufficient to support the change from a demand-led to an (at least) "investment-supported" growth pattern remains to be seen.

2. *Nigeria: a case of too much oil?*

The economy of Nigeria is clearly in need of structural change that will promote economic growth and prevent severe external imbalances in the future, but policy options are extremely limited because of the country's debt problem. Two sets of factors are of major significance: the external economic shocks inflicted on the economy, and the economic policies implemented, not only in recent years, but during the early 1970s.

The performance of manufacturing is a central issue. Its large imports of inputs and capital goods and its failure to earn significant export revenue amounts to a heavy burden on Nigeria's balance of payments. The early development of the manufacturing sector in Nigeria followed a common pattern: agro-based processing for export was followed by the production of goods such as textiles, beer and cement for the domestic market. Then followed a widening range of consumer goods produced largely on the basis of imported inputs, often amounting to slightly more than assembly-type operations, typical of the so-called "easy" stage of import substitution.

The 1970s and 1980s were marked by two major surges in oil prices, around 1973 and 1980. The resultant rapid increase in export and government revenue had, apart from its immediate effects on the external balance, deeper and lasting effects on domestic prices, financial flows, government spending, income distribution and the size and disposition of real GDP. The quadrupling of oil prices from 1972 to 1974 coincided with a 24 per cent increase in exported quantitites of crude petroleum [45]. This resulted in a fivefold increase in the dollar value of exports and a nearly sixfold increase in the naira value of government revenue, bringing the contribution of oil revenue to the government revenue up from 52 to 82 per cent. The vastly increased amount of foreign exchange was rapidly recycled. Government expenditure increased in step with revenue. Recurrent spending was fast to take off, but later capital expenditure rose relatively faster.

A significant feature of economic policies during the oil boom period was the inconsistency between declared industrial objectives and macro-economic management. The strategy pronounced in the third national development plan (1975-1980) was to capture the opportunities presented by a fast expanding domestic market and abundant foreign exchange. A growth rate of 18 per cent per annum was planned for the manufacturing sector. The utilization of local resources was stressed among the many and diverse industrial objectives. The public sector was given a major role in the production of capital and intermediate goods.

Macro policies included substantial incentives for producers to overcome bottlenecks by importing and thus boosting profits. The nominal exchange rate was allowed to appreciate. Because of higher inflation in Nigeria than in its trading partners, the real exchange rate appreciated rapidly. Import duties which had been relatively low were little changed. Moreover, "approved user status" which allowed considerable duty concessions for imports of both capital goods and intermediates in eligible industries was expanded in 1973. Export promotion was given little attention. The scope for manufacturing exports was also negatively affected by the world-wide demand contraction in the wake of the first oil price rise.

The foreign exchange constraint, the collapse of oil prices and tight demand management led to a drop in GDP of 3.3 per cent for the year 1986, stemming from a decline in most branches except agriculture (see table 37).

The manufacturing sector, hit by the recession, increasing import prices and lack of availability of imported inputs, did not, however, suffer too badly in 1985 and part of 1986.

Although overall capacity utilization is reported to be as low as 20-25 per cent, data at the firm level indicate substantial variation, with some enterprises apparently doing very well in terms of profits. There may be several reasons for this. The clamp-down on

Table 37. Growth rates of GDP and selected industries in Nigeria, 1985-1986

(Percentages at constant prices)

Item	1985	1986
Total GDP	2.4	−3.3
Construction	−5.0	−5.0
Wholesale and retail trade	3.0	−5.0
Manufacturing	4.8	−6.4
Agriculture	3.5	2.2
Housing	1.3	−10.0

Source: Budget speeches of the Minister of Finance of Nigeria, 1986-1987.

imports by means of quantitative restrictions and foreign exchange rationing created bottlenecks in the supply of many kinds of manufactured goods and rising prices. Firms that were well organized and managed to secure their supply of imported inputs and spare parts have been able to take advantage of this situation. The overvalued exchange rate yielded substantial windfall gains to those able to obtain foreign exchange allocations. Moreover, parts of the manufacturing sector responded to the crisis through rationalization, laying off strictly unnecessary staff and achieving more efficient utilization of raw materials.

Towards the end of 1986 it had, however, become clear that serious difficulties lay ahead. In addition to the fact that there was little scope for further cost cutting, the 30 per cent import levy and later the rapid depreciation of the naira had cut profits severely. At the same time, restrictive demand management had led to an increasing shift from the seller's market prevailing since the early 1970s to a buyer's market.

Industrial investors and management are facing a new situation that is likely to persist for several years to come. Whereas the problem earlier was to satisfy a seemingly boundless domestic market demand for manufactured goods with few restrictions on foreign exchange and imports, business conditions are now much more uncertain. Enterprises will have to pay closer attention to rationalization and cost reduction. The advance planning of import needs and obtaining import permits and foreign exchange will also be of greater importance to successful management. As the naira is gradually depreciated and the market mechanism, rather than administrative measures, is used for allocating imports, cost structures will change and give rise to a need for rapid adaptation.

The year 1986 brought some indication of the shape of coming structural changes. Clearly, the most import-dependent branches have been worst hit. While this is in line with overall restructuring policies, it has a damaging effect on skills, technological capacities and production capital already built up. An illustrative example is the automotive industry where the work force was down from 30,000 in 1978 to 10,000 at the end of 1986, 6,000 members having been laid off during the last half year. Many firms in the branch were closed down during much of 1986.* Some producers will probably face a complete shut-down in 1987 unless special import advantages are granted.

Prospects are slightly brighter for the food, beverages and textiles industries, for which a substantial part of raw materials are produced locally. For instance, Nigeria's 52 breweries (30 operational at the end of 1986) face the task of converting to home grown inputs instead of imported barley within 10 years (the 25 per cent target was to be achieved by the end of 1986) [46]. The large breweries have responded well, attempting to solve technical problems and undertaking the large-scale growing of substitutes. Daunting tasks still lie ahead to achieve technological change without disruption of production, and to mobilize finance for the necessary plant restructuring. The import ban on rice, maize and wheat could have beneficial effects on the growing and processing of these grains in the longer run, but the short-term effects have partly been disrupting. For example, the ban on wheat threatens to disrupt the operation of several wheat mills and thereby force closures in the bakery industry. A more gradual phasing-out of wheat imports, giving time for adjustments in processing, is necessary. Textile industries, which at present spin and weave materials from long-staple cotton, whereas growers produce short-staple cotton, are in need of similar adjustments.

The new and harsher environment for manufacturing is also likely to have an effect on the size and distribution of firms. The bankruptcy rate for smaller companies has increased and is widely expected to reach alarming proportions in 1987. This runs against the government intention to develop the small-scale industry as a basis for growth.

Nigerian manufacturers were, at the beginning of 1987, pressing for several concessions to industry.* They included the following:

(a) Phasing out the import licensing system, since manufacturers have been meeting only an estimated 25 per cent of their needs from imported raw materials;

(b) Increasing the import duty differentials between imported inputs and imported finished products;

(c) Eliminating the credit gap stemming from strict Central Bank of Nigeria policies, since this runs counter to the government support programme for local sourcing;

(d) Speeding up procedures for obtaining import licenses and permits for expatriate technical expertise.

3. Sri Lanka: trade and investment diversification needed

During the 1960s and early 1970s Sri Lanka followed an essentially inward-looking economic development strategy which sought to shield the economy from international competition and external shocks by strengthening the country's import-substitution industries behind high tariff and non-tariff barriers. However, the narrow absorptive capacity of the domestic market set effective limits to this strategy. Moreover, it created a highly import-dependent pattern of production, further aggravated by rapidly rising food imports. Since this was compounded by a failure to

*According to a report of the *Economist Intelligence Unit*, January 1987.

*Drawn from recent issues of *African Economic Digest* and *African Business*.

give sufficient attention to the development and diversification of the country's export base, chronic shortages of foreign exchange soon emerged. The GDP growth rate declined to only 2.9 per cent and the annual real MVA growth to an even lower rate of 1.0 per cent per annum during 1970-1977.*

A new development strategy launched in 1977 clearly marked a turning-point in the country's recent economic history. Within a framework of open-door policies, sweeping economic policy reforms were introduced. The salient features of the reforms included: increased liberalization of imports by substituting tariffs for non-tariff barriers; establishment of the legal and institutional framework to attract foreign direct investment; reduction of price controls; introduction of a unified and floating exchange rate; and removal of State import monopolies and lowering of corporate and personal taxes.

The immediate result of the new, outward-looking, private-sector-led strategy was an impressive upsurge in the GDP growth rate, which rose from 4.2 per cent in 1977 to 8.2 per cent in 1978. It fell back again in subsequent years, and in the early 1980s ranged between 5 and 6 per cent, a level that—under optimistic assumptions—the economy may be able to maintain in the near future. After four consecutive years of very stable growth of between 5.0 and 5.1 per cent (1982-1985), the provisional figure for 1986, however, showed a considerably lower rate of 4.0 per cent. Growth rates for the manufacturing sector have fluctuated widely in recent years, ranging from 0.8 per cent in 1983 to 12.3 per cent in 1984, partly due to the high MVA share of the public sector oil refinery which was at times temporarily closed down for repair work [48].

With exports only able to cover between one half and two thirds of import requirements, Sri Lanka recorded large merchandise trade deficits during the early 1980s, both in absolute terms and relative to GDP. Due to the large, although declining, importance of private transfers (worker remittances) and public transfers (official development assistance), the current account deficit has always been lower, amounting, however, to as much as 10 per cent of GDP in 1985. As was the case for other non-oil-producing developing countries, the country experienced a second oil price shock in 1979/1980. The share of oil in total imports jumped from 17 per cent in 1979 to 24 per cent in 1980. A peak level of 29 per cent was reached in 1982, after which the share gradually declined again to 21 per cent in 1985. At the same time, the share of imports in GNP reached an all-time high of 50 per cent in 1980 (after 43 per cent in 1979), which, with the declining export share, resulted in a merchandise trade deficit of approximately 24 per cent of GNP. Partly as a result of increased import bills, the ratio of domestic savings to GDP declined to 11 per cent in 1980 and remained roughly at this low level until 1984. With a domestic investment ratio of around 30 per cent in the early 1980s, the savings gap increased sharply to a peak of 23 per cent of GDP in 1980 [48].

More recently, the deterioration of the balance of payments in 1985 was largely induced by external factors, mainly the reduction in export earnings from the three major plantation products (tea, rubber and coconut) which together account for more than 50 per cent of total exports [49]. This in turn was largely caused by substantial price declines of 26 per cent for tea, 23 per cent for rubber and 49 per cent for coconut products. Industrial exports proved unable to compensate for these negative influences. Still worse, exports of textiles and garments, by far the most important industrial foreign exchange earner, accounting for more than 20 per cent of total export value, declined for the first time in 10 years (by 1 per cent in SDR terms), after a long period of two-digit growth rates. To a large extent, this seems to reflect the impact of more restrictive quota allocations in the markets of many developed countries.

The persistent need to finance high current account deficits in the recent past has led to the building-up of a sizeable external debt, which in 1985 amounted to a total of $4.5 billion (disbursed plus undisbursed funds). As a result, the debt service ratio rose sharply from 13.5 per cent in 1978 to 22.5 per cent in 1985. With exports expected to remain stagnant or to increase very modestly while major commercial loan repayments are due, the debt service ratio is expected to rise further to a level of about 30 per cent during 1986-1988. This obligation, though not exceptionally high when compared with that of some other developing countries, undoubtedly represents a heavy burden that pre-empts the more efficient allocation of productive resources.

The second major source of concern has recently been the country's budget situation. While the intention was to reduce the budget deficit from 14.4 per cent of GDP in 1985 to 10.3 per cent in 1986, it actually rose to an unsustainable level of over 16 per cent. The major contributing factor was defense spending, although external factors had an impact as well, in particular a revenue shortfall caused by falling agricultural export prices.

Structural change within the industrial sector has tended to favour the so-called "factory industries" (manufacturing proper) at the expense of "export processing" (the processing of the major plantation crops, namely tea, rubber and coconut). The former accounted for 49 per cent of all manufacturing activities in 1970, and increased their share to 67 per cent in 1985. They have clearly become the backbone of the country's manufacturing sector. Under the Public Investment Programme 1985-1989, their relative position is to be further strengthened.* This means that structural change in the manufacturing sector has added a new source of external vulnerability to the traditional instability of commodity exports. With the largely export-oriented textiles, clothing and leather industries now accounting for one quarter of manufacturing production, Sri Lanka's industrial prospects will be increasingly influenced by technological trends and trade policy developments in the global textiles and clothing markets.**

*Calculated from figures given in [47].

*The Public Investment Programme 1985-1989 put the growth rate for export processing activities at 1.8 per cent per annum for the 1984-1989 period, whereas for the remainder of manufacturing the growth target was set at 8.6 per cent.

**This does not mean that the country should not have entered into world market competition as an exporter of labour-intensive manufactures. However, the risks associated with this strategy should receive full attention.

Two unfavourable factors need to be noted in connection with the rise of factory industries in general and textiles and clothing production in particular. The ratio of value added to gross output declined significantly to 31 per cent in 1984 from 44 per cent in 1973, while the share of imported inputs in total inputs increased sharply to almost 90 per cent during the first half of the 1980s (except in 1982). This is highly indicative of weak backward and forward linkages in the domestic economy.

On the brighter side, direct foreign investment has surged in recent years, totalling more than 8 billion Sri Lanka rupees by the end of 1986, both inside the country's export-processing zones (Katunayake, Biyagama) under the authority of the Greater Colombo Economic Commission and outside those zones under the Foreign Investment Advisory Committee. The share of regional investment sources (Hong Kong, Japan and Singapore) is relatively high, mainly in the textiles and clothing industries, where the evasion of Multi-Fibre Agreement quotas established in OECD markets has been a major investment attraction. However, the high concentration of foreign investment in only one specific industrial branch has raised serious concern about the possibility that some of these activities may be of a temporary nature. The Government is anxious to diversify the structure of exports by according priority to foreign direct investments in non-garment manufacturing.

4. The Philippines: external and internal shocks combined

Industrial policies have strongly influenced the development of manufacturing in the Philippines during the past 30 years. In the early 1950s import substitution of consumer goods was introduced as the primary policy instrument to promote industrialization, to which the industrial sector responded quite favourably, but by the end of the decade the easy phase of import substitution had run its course, and industrial growth slowed down (from 12 per cent to less than 4 per cent per annum). During the 1960s the manufacturing sector lagged behind overall economic growth, which averaged over 5 per cent per annum. During this time of continued import substitution the policy instruments were shifted from strict import restrictions to highly protective tariffs. These were only slighly reduced in the early 1970s when the effects of a devaluation, export incentives and a variety of export promotion facilities resulted in relatively fast growth for a few selected manufacturing export industries ([50], [51]).

In spite of these measures, however, the thrust of the basic import substitution strategy was never revised, and the country persisted in policies that provided continued and increasing subsidies to large-scale urban industries, while neglecting agriculture and non-urban small and medium-scale industries. The industrial policy of the Philippines followed a relatively narrow and concentrated urban-oriented growth path. The cumulative effects of the policy, as was evident in the early 1980s, were as follows:

(a) A bias against agriculture, exports, regional urban development and small and medium-scale industries;

(b) A pattern of industrial development unsuited to the country's natural resource and labour endowments;

(c) Reduced flexibility in the allocation of foreign exchange;

(d) Creation of an over-dependence (as sources of foreign exchange) on exports of primary commodities subject to sharp price fluctuations;

(e) Over-emphasis on the production of finished consumer goods to the detriment of intermediate and capital goods.

Bearing these effects in mind and noting how the increasing inefficiency of manufacturing industry during the 1970s had become more and more apparent, the Government introduced in the early 1980s a programme of major industrial policy changes with respect to the prevailing trade régime, the existing investment incentive system and export promotion. This programme was supported through structural adjustment loans of the World Bank ([50], [52], [53]).

The trade policy reforms were designed to correct the substantial number of distortions that had crept into the industrial economy as a result of the plethora of controls, restrictions and tariffs that characterized the earlier trade régime. Import substituting manufacturing industry had received extensive protection at the cost of agriculture and other exporting industries. As noted above, this had made domestic-oriented manufacturing industry much more attractive for investment throughout the 1970s, as compared with agriculture, primary production and export-oriented industries. For further growth of industry it was imperative to remove this bias so that domestic-oriented industries could eventually compete in the export market and hence not be limited by the relatively small domestic market for further development. The rise in oil prices also led to deep concern about energy conservation and development of domestic energy supplies.

The trade liberalization programme consisted of the following elements: reduction in the level (the average being cut back from 43 to 28 per cent) and range of tariff rates; removal of quantitative import restrictions; and realignment of indirect taxes in order to make them trade-neutral. The programme of reforms had proceeded broadly on schedule until the 1983 political and economic crisis. The ensuing balance-of-payments crisis led to an effective rollback of some reforms and abandonment of others. The tariff reform programme, however, survived the crisis ([54], [55]).

The rise in oil prices in 1979 was undoubtedly a major shock to the Philippine economy and to its industrial sector in particular. The resulting debt crisis—acute by 1983—was deepened by much-weakened terms of trade.* However, it can be plausibly argued that it had its real roots in the inefficiencies that had long existed in the industrial sector. Despite heavy investment, growth in manufacturing had declined every year, with one exception, since 1977 (*see* table 38).

The Philippine economy in the early 1980s was not export-led but debt-driven, through both easy foreign lending and increased government expenditures. Industrial investment tended to continue to be mostly capital-intensive and import-dependent. Although the external

*By the end of 1985, the net terms of trade had deteriorated to 55.9 index points in relation to 1972 = 100.

Table 38. Annual MVA growth rates in the Philippines, 1977-1985

Year	MVA growth rate (percentage)
1977	7.7
1978	7.1
1979	5.2
1980	4.5
1981	3.4
1982	2.1
1983	2.4
1984	−7.1
1985	−7.3

Source: UNIDO data base.

shocks of these years (fluctuating oil prices, high interest rates, world recession, low commodity prices and renewed protectionism) all contributed to an aggravation of the economic performance of the Philippines, they were not fundamentally responsible for its structural problems. The country's structural inability to cope with the crisis of these years was reflected in negative economic and manufacturing growth and 50 per cent inflation. In the last two years of the previous Government, in 1984 and 1985, the debt-induced foreign exchange crisis took its toll and austere macroeconomic policies were adopted following IMF prescriptions. In early 1986 there was great pressure on the new Government to find a route to rapid economic recovery, without losing sight of the longer term goal of sustainable growth. The achievement of the latter would require a reorientation of the economy towards stimulating an expansion of domestic purchasing power, in particular that of rural households, which could be attained by: increases in relative prices of agricultural products, thereby also stimulating production; improvements in agricultural productivity; and land reforms, including improved use of natural resources. A well-structured development-oriented trade régime coupled with increased domestic demand would benefit agriculture and promote the growth of labour-intensive manufacturing, in particular small and medium-scale industries in the regional and provincial areas. This means that, in contrast with the past pattern of urban-oriented, capital-intensive and large-scale industrialization, mainly concentrated in Greater Manila, a more rural-oriented, regionally dispersed, labour-intensive industrial policy supporting small and medium-scale industries would be necessary ([50], [51], [56-60]).

Accordingly, the main guidelines proposed for the new Government's industrial policy included the following:

(a) In the short term, that is until economic recovery, priority should be given to the effective utilization of excess industrial capacity. Attention should be given to the provision of training and information, the easing of bottlenecks in supply of inputs, infrastructure improvements, particularly in rural areas, easier access to credit and technical and marketing assistance services;

(b) Production and export of light consumer goods should continue to receive attention and support. Subcontracting arrangements between small, medium- and large-scale enterprises should be promoted;

(c) Far-reaching reforms of the existing system and structure of protection should be undertaken. To make local industries more competitive, trade should be liberalized.* Before the end of 1988 all quantitative restrictions (except those imposed for health and safety reasons) should be removed. Tariffs would be the principal protective instrument. Temporary (and non-extendable) increases in tariff rates should be granted to industries requiring interim protection;

(d) The system of incentives should be reformed** through the introduction of simplified investment and export incentives. Under the industrial incentive policy applied prior to 1983 most incentives depended on the value of the intended investment. The new incentives system should be performance-oriented and related to value added rather than just the scale of investment. Another explicit aim should be export promotion to enable exporters to gain easier access to inputs at world market prices;

(e) Foreign investments should be welcomed and encouraged, principally to complement domestic investments in areas where the latter was inadequate. They should be encouraged in high-value-added, export-oriented and employment-generating activities to maximize their contribution to the economy. In offering incentives to foreign investors, emphasis should be placed on facilitating entry and providing adequate infrastructure as well as a healthy business environment;

(f) Science and technology development in the industrial sector should be geared towards increasing productivity and international competitiveness. The Government should help the private sector to meet the scientific and technological requirements of industries.

5. *Lessons of policy experience*

This brief four-country survey of policy responses to recent external economic shocks may help to clarify several general points. The traditional one-dimensional development strategies propounded by early post-war economic theorists and to some extent put into practice, such as export promotion and especially import substitution, no longer provide (if they ever did) a useful basis for government economic policy. The studies show that Governments, at least partly in reaction to external forces, have become inventive in their policy

*In the short term, however, the Government was concerned about the further loss of industrial employment that might result from import liberalization being implemented during recession. Import liberalization at present should be carried out very carefully, to avoid serious harm to essential competitive industries through competition from imports when industrial costs are high because of low capacity utilization.

**Eligibility for incentives depends on the inclusion of an industry in the investment priority plan prepared by the Board of Investments. Prior to 1981, the criteria for inclusion were related to an evaluation of domestic demand and the adequacy of existing capacity. New guidelines and procedures for the determination of investment priority were issued in August 1983. The Board of Investments applied criteria related to the economic rate of return, domestic resource cost and effective protection rates in the preparation of the 1984 and 1985 investment priority plans. These plans were broad in scope, with 330 areas of investment being included in the 1985 plan. Considerable progress has thus been made in rationalizing the determination of priority areas.

design and implementation. In particular, the new policy responses have focused more on competitiveness, international cost-price structures and the relationship between macro-policy, trade controls and micro-economic (producer) decision-making. Increasing emphasis is being placed on lower and less variable levels of protection, and on more transparent and flexible control instruments.

In sum, although the final outcome is still uncertain, the new policy responses seem to be the right ones for limiting the negative consequences of the external economic shocks. Nevertheless, it seems clear that the shocks themselves could have been largely overcome had there been greater co-operation within the system of international trade and finance.

F. Conclusions

For many developing countries, particularly in Latin America, a fairly common strategy until the onset of Mexico's debt crisis in 1982 had been to accept the potential short-term financial risks of heavy external borrowing as the price of financing the ambitious investment programme needed to achieve a broader industrial base and a more diversified industrial structure. This debt-financed capacity expansion had been to a large extent fuelled by abundant international liquidity in the form of surplus petrodollars, which were available at very low real interest rates throughout much of the 1970s, and sometimes at negative rates as in 1974-1976. Since the early 1980s, however, external shocks and the ensuing debt crisis have overtaken this strategy of growth through debt. Nevertheless, some of the developing countries or areas, notably India, Singapore and Taiwan Province, which had shunned the debt-financed growth strategy, have emerged from the difficulties relatively unscathed. Even some heavily indebted countries like the Republic of Korea have continued to perform successfully thanks to their resilient and adaptable economic structure.

The capacity to respond to external shocks varies through a broad spectrum of countries. At one end of the spectrum are found a small number of developing countries (for example, Argentina, Brazil, Republic of Korea and Singapore) with a comparatively mature industrial structure enabling them to adjust to external shocks far better than other developing countries. At the other end of the spectrum, there are many African developing countries with a severely limited adjustment capacity constrained by narrow specialization in the export of a few primary commodities. The bulk of developing countries falls however in the vast area between these extremes. This diversity in the adjustment capacity of developing countries seems to underline the need to complement cross-country assessments with the case-by-case in-depth analysis of individual developing countries.

It has been argued in this study that the *ex post* effect of unfavourable external shocks has invariably been the deterioration of the current account balance and the consequent reduction in the import capacity of a developing economy faced with difficulties of boosting exports in the short run. Moreover, it has been emphasized that such import reductions were usually accomplished at the expense of industrial supplies and capital goods, given the narrow margin for paring other essential imports such as foods and fuels.

Restrictions on imports of vital industrial raw materials and machinery and equipment may have had devastating consequences for most developing economies. Because of the embryonic stages of capital goods industries and highly import-dependent basic industries with relatively undeveloped inter-industry linkages, capacity underutilization and production disruptions resulted and, still worse, the growth of productive capacity became stunted when these industries were starved of essential complementary imports. The implications of import strangulation extend far beyond the substantial losses of potential output and employment in the manufacturing sector. More importantly, the contraction of output and employment in the manufacturing sector further depresses the level of overall domestic economic activity from both the supply and the demand side. Such a contraction is likely to have a far greater adverse impact on the entire economy in terms of potential output and employment foregone, as the contractionary forces originating in the manufacturing sector are transmitted to other sectors of the economy through inter-industry linkages and multiplier effects.

In particular, the fall in growth rates and levels of output in the capital goods industries amounts to a forced reversal of the industrial development strategy that developing countries espoused during the 1970s. Such a reversal may produce long-lasting damage, substantially outweighing any short-term foreign exchange savings or other benefits from the import reduction. The flexibility of an economy and its capacity to adjust and grow, with resources moving freely within and between factor and product markets in response to changes in the external and internal economic environment, depend critically on the growth and efficiency of a manufacturing sector that produces intermediate and capital goods as well as a wide range of consumer goods.

In sum, the manufacturing sector in developing countries has borne the brunt of policies of adjustment to external shocks in the 1980s. In the face of mounting external payments difficulties, such adjustment measures have been taken to generate a large trade surplus quickly, often by reducing import capacity along with more external borrowing to stretch out the debtor's loans. However, this has resulted in the worst combination of all possible results. On the one hand, international banks keep on lending debtor countries enough to cover the successive rounds of interest bills, each round of debt rescheduling thus further increasing the debt burden. On the other hand, the contractionary forces of adjustment policies, and particularly drastic reductions in import capacity, have seriously undermined the long-term capacity of developing countries to expand output faster than growing debt.

Looking back into the histories of the now highly industrialized economies, one learns that more or less continuous structural adjustment is one of the key features of economic development. Indeed, an improved ability to adjust is itself a factor conducive to long-run development. But there has been a growing recognition

that adjustment is a gradual process, involving changes in the allocation of resources among sectors, economic actors, interest groups and institutions. The experiences gained with the IMF and World Bank adjustment lending programmes suggest that, even though a broader degree of agreement exists now on the desirable content of macroeconomic policies than in earlier periods, the agreement tends to collapse when it comes to the choice of development strategy and transition paths in individual countries.

The role of industrialization is certainly an important facet of the design of adjustment programmes. Leaving aside Latin America, emphasis has been placed almost exclusively on agricultural development in the programmes for sub-Saharan African countries. Agricultural development itself, and the need to diversify the exports of these countries, require the development of complementary manufacturing activities. For that matter, the focus will have to be, at least initially, on the industries which contribute directly to improving agricultural productivity and the industrial utilization of domestic natural resources. And rehabilitation and productivity improvement in these industries would demand a careful assessment of the potentials of key inter-industry linkages and particularly of the need for improved domestic capabilities for industrial repair and maintenance. Even in the case of small, industrially lagging countries, an aggressive development strategy may well be justifiable in the domain of essential capital-goods producing subsectors, if supported by appropriate joint activities among the countries having a relevant framework of co-operation.

The emphasis on export promotion is indeed consistent with that on efficiency in most World Bank structural adjustment lending programmes. According to a recent World Bank study, achievements in export-led adjustment and growth have not been very impressive, because of declining world prices, already-crowded markets, or quota barriers in developed countries. More generally, confidence in prescriptions for policy reform quickly breaks down when the question is raised as to the ability of economists to forecast future world economic environment. Mexico offers a pertinent example of the stringent and politically risky policy packages which have proved ineffective due to unforeseeable external shocks.

The "Baker Plan" is known for the "new orthodoxy" of adjustment it propounds. It stresses that adjustment should not be confined to deficit countries, but should include surplus countries. Thus, it is a concept to be pursued most actively as an important element of international economic management. The central objective of international debt reform strategy should be conceived, not as adjustment *per se*, nor as an arrangement for "defensive lending" to protect the value of creditors' claims, but to restore "sustainable growth with adjustment". Accordingly, measures addressed to the productive system and the productivity-raising aspects of industrial restructuring should receive more active attention. The pressure to shift resources from the public to the private sector and to curtail government expenditures ought not jeopardize the maintenance of those public services which are essential for building up the basis for long-term development.

The policy design of adjustment with growth leaves us with a number of additional issues. As regards the relative roles of the private and public sectors, it should be borne in mind that development is best promoted by a judicious and mutually reinforcing blend of public and private activities. Deregulation and privatization have become a popular element in the recent policy reforms in developing countries, including least developed countries, and are often associated with the conditionality attached to IMF and World Bank lending programmes. But a detailed examination of these programmes reveals that the divestiture of public enterprises to the private sector has occurred in only a limited number of cases and that emphasis has been more on deregulation and competition than on denationalization *per se*. Privatization is often seen to be a token measure for securing the continued flow of external finance.

In fact, government intervention continues to play a decisive role in export promotion, small-industry promotion, credit allocations, interest rate subsidies and, more generally, in providing the facilities generating desirable externalities for individual efficiency-conscious enterprises. Even the efficacy of price mechanisms depends on the efficiency and costs of information flows and the mobility of resources. A mere manipulation of incentive schemes would be ineffective without adequate public support to improve transportation and communication systems. The pro-private-enterprise thrust of today should be tempered with cautious pragmatism.

Appendix I

ESTIMATES OF FOREGONE INDUSTRY OUTPUT AND EMPLOYMENT

The pattern of capacity expansion in the manufacturing sector as a whole in the 1980s seems to have close parallels in each of its branches, specifically the agrofood, light, basic and capital goods industries. Table 42 in appendix II to this chapter suggests a remarkably sharp decline in the rate of capacity expansion in all industries, with some minor exceptions based on aggregate values. One dominant feature of this seemingly diverse pattern of industrial growth is the relative importance placed on investment allocation in the basic and capital goods industries during the 1970s and, in consequence, the proportionately heavier cutback in the rate of capacity expansion of these industries during the 1980s in most countries, except for the African countries considered in this study.

The general relationship between output and investment can be captured by the industry production function. Based on a simple production function concept, industry value added is postulated as a function of lagged cumulative gross investments, which represents a proxy for capital stock. Underlying these industry production functions is the assumption of a constant average capital-output ratio over the observed period, that is,

$$Y_i = k_i K_i$$

where k_i is the constant output-capital ratio of industry i and K_i is the capital stock of industry i. If it is further assumed, for the sake of simplicity, that depreciation can be approximated as a constant proportion p_i of the sectoral gross investment, I_i,* the capital stock in discrete units at time t will be

$$K_i(t) = K_i(0) + (1-p_i) \sum_{m=0}^{t-1} I_i(m)$$

Then, it follows from the above two equations that sectoral output can be expressed as a function of the cumulative gross investment, i.e.,

$$Y_i(t) = k_i K_i(0) + k_i (1-p_i) \sum_{m=1}^{t-1} I_i(m)$$

Given a numerical value of p_i, the ICOR can be readily calculated. Furthermore, once the k_i is estimated, the initial capital stock $K_i(0)$ can be also determined and hence the capital stock series constructed.

In practice, since industry depreciation rates p_i are extremely difficult to estimate, it is necessary to work with the gross ICOR, which is the inverse of the regression coefficient for the cumulative gross investment, bearing in mind that the coefficients represent approximate upper limit values for the net ICOR.**

For a sample group of countries, such production functions were estimated by least squares for the manufacturing sector as a whole, and its four major subgroups of agrofood, light, basic and capital goods industries. Most of the industry production functions estimated for the sample group of developing countries were statistically significant in terms of the goodness of fit as judged by the adjusted R^2 and t-values of the regression coefficients. The estimated industry production functions varied considerably between countries and industries because of inter-country and inter-industry differences in factor proportions, capacity utilization, the efficiency of capital and labour and many other factors, including measurement and estimation errors.*

Given the assumptions made and the limitations inherent in this quantitative exercise, its results and conclusions should be interpreted with caution and regarded only as the best approximations possible for the time being. Yet the principal findings seem to contain interesting and substantive implications.

Gross ICORs by industry in the sample group of developing countries have been calculated from the regression coefficients and are given in table 39. In general, these ICOR estimates fall within the range of what might be normally expected. The ICOR for India seems too high, perhaps because of the possible underestimation of investment. The estimates reflect both the average level of operative efficiency and the extent of capacity utilization prevailing in each country during the period of observation.

As in the case of the manufacturing sector as a whole, potential industry output, which was calculated on the assumption that the rate of capacity expansion observed during the 1975-1980 period would continue, was compared with actual performance during the period. More specifically, using the annual average growth rates of industry capital stock during 1975-1980 (and other periods for some countries for which data were incomplete) given in table 42 of appendix II to this chapter, potential industry output in the selected sample countries or areas was projected from industry production functions for the 1981-1985 period. Year-to-year actual and potential industry output for each country is shown in figure XVIII. Cumulative results for the 1981-1985 period are summarized in table 40 to facilitate an inter-country comparative assessment of output losses.

Despite considerable variations between countries and industries, these country pictures reveal the general pattern

Table 39. Incremental capital-output ratios for selected industries in various developing countries

Country	All manufacturing	Industries			
		Agrofood[a]	Light[b]	Basic[c]	Capital goods[d]
Brazil	2.86	2.82	2.85	2.79	3.07
Colombia	2.94	1.12	8.53	5.85	2.08
Cyprus	3.53	4.54	1.55	6.01	3.04
Ecuador	3.39	5.05	2.64	2.75	9.88
India	6.22	1.92	14.81[e]	9.51	5.18
Malawi	5.78	4.35	6.68	—	—
Kuwait	4.32	3.40	--	5.36	1.85[e]
Republic of Korea	3.22	3.27	3.25	3.63	2.69
Swaziland	12.64	9.59	—	—	—
Tunisia	4.99	4.23	2.97	5.93	1.27
Turkey	2.20	1.02	6.14	2.11	2.62
Venezuela	3.01	1.05	3.03	3.40	4.70
Zimbabwe	7.46	4.17	5.85	13.91	4.87

[a] ISIC 311-314
[b] ISIC 321-322.
[c] ISIC 341-381.
[d] ISIC 382-385.
[e] Statistically insignificant

*In this instance, p_i is the proportion of annual investment, not of capital stock, used for the replacement of worn-out capital, and hence it differs from the depreciation rate based on the capital stock.

**If the regression coefficient is denoted by $b = k(1-p)$, where k is the incremental output-capital ratio and p the depreciation rate, then the gross ICOR is $(1/b) = 1/(k(1-p))$. But the net ICOR is $(1/k) = (1/b)(1-p)$ and hence $(1/k) < (1/b)$ for $0 < p < 1$.

*The regression results of industry production functions for the sample group of developing countries are available in the unpublished technical appendix.

Table 40. Cumulative potential manufacturing output foregone in various developing countries and areas, 1981-1985

(Millions of 1980 dollars)

Country or area	Total MVA loss	Percentage[a]	Industries							
			Agrofood loss	Percentage[a]	Light loss	Percentage[a]	Basic loss	Percentage[a]	Capital goods loss	Percentage[a]
Brazil	78 196	30.6	7 984	15.8	7 247	17.8	35 080	30.4	27 887	57.2
Chile	1 930	7.8	1 433	22.2	−30	0.0	379	2.8	149	14.5
Colombia	5 169	15.9	3 376	24.0	236	4.7	1 028	9.5	529	21.1
Cyprus	234	11.7	62	14.6	34	4.5	119	18.3	20	11.1
Ecuador	2 038	19.6	852	21.0	418	16.5	718	19.7	48	35.6
Egypt	2 313	13.7	366	10.7	374	8.6	827	12.4	745	31.6
Hong Kong	2 323	8.5	65	4.7	1 123	10.0	582	7.4	552	7.9
India	9 970	7.7	2 019	11.3	509	1.3	6 823	14.6	619	2.4
Indonesia	7 182	17.3	831	9.7	4 429	68.3	1 812	7.6	309	10.4
Kuwait[b]	452	17.7	36	16.8	—	—	379	16.2	37	30.0
Malawi[c]	406	53.7	332	71.9	24	12.7	49	47.1	—	—
Malta	487	29.1	10	3.0	263	45.8	166	49.3	48	11.4
Mexico	21 558	11.2	1 761	3.3	1 290	3.8	13 467	17.5	5 040	17.3
Philippines	5 427	10.3	716	3.1	2 447	24.5	366	2.5	1 898	37.5
Republic of Korea	33 542	36.8	2 674	29.8	5 862	30.3	13 217	32.9	11 788	51.9
Singapore	447	2.8	1	0.2	19	1.7	−113	−1.9	540	6.3
Swaziland[b]	−8	−5.5	−14	−15.3	2	16.1	13	7.1	—	—
Togo[b]	7	5.3	0	0.0	3	5.3	4	36.7	—	—
Tunisia	1 553	24.7	315	21.0	220	13.9	819	30.8	199	36.7
Turkey	7 821	10.1	2 548	17.1	266	2.0	3 510	9.6	1 496	11.7
Venezuela	23 984	44.9	6 991	48.1	646	16.8	15 168	47.8	1 144	36.2
Zimbabwe	−112	−1.6	108	6.5	−139	−9.0	−84	−2.8	3	0.5

[a]Cumulative potential MVA foregone as percentage of cumulative actual MVA, 1981-1985.

[b]Cumulative MVA, 1981-1982.

[c]Cumulative MVA, 1981-1984.

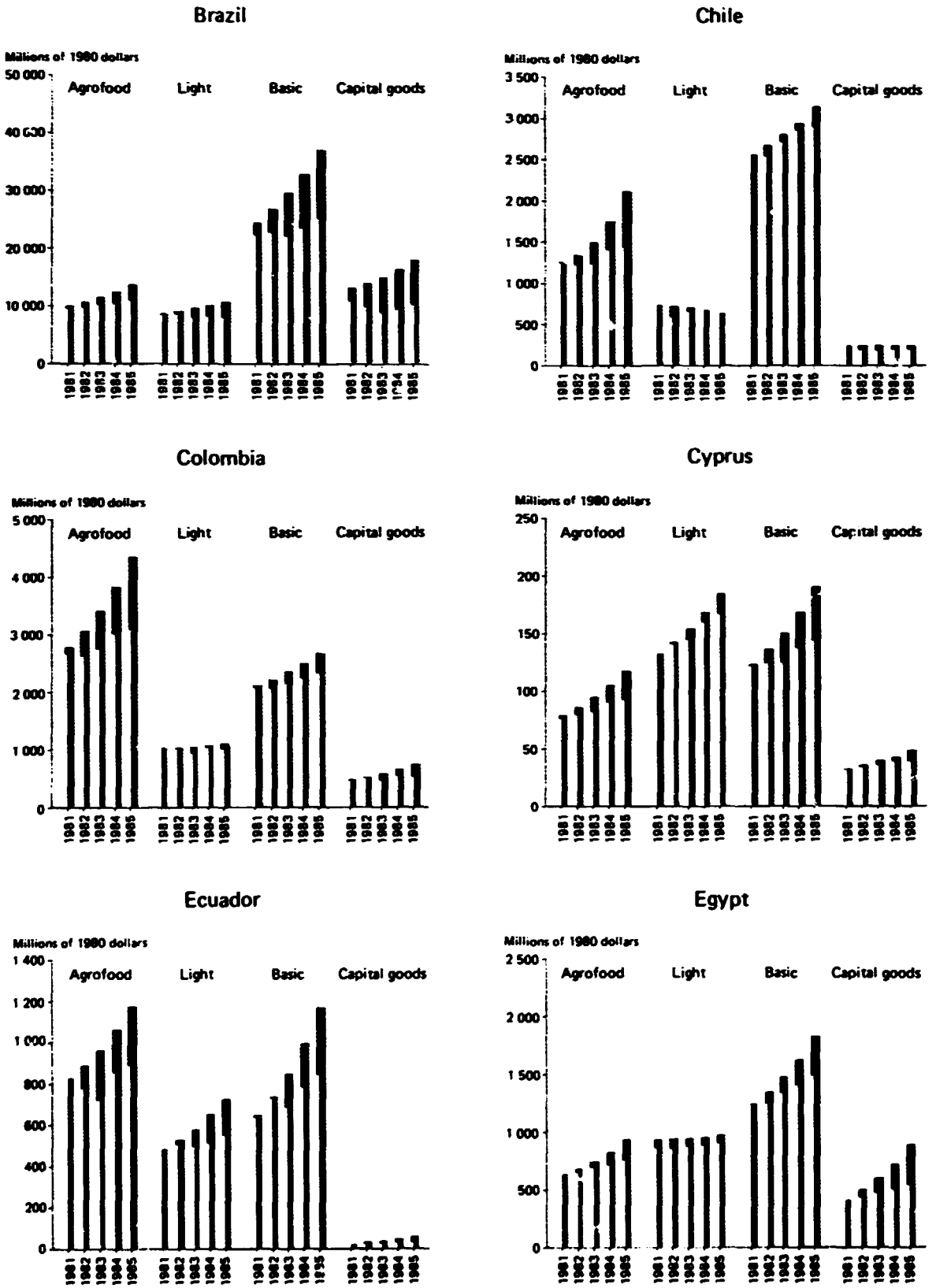
of a steadily widening gap over time between potential and actual output across countries and industries. A prime cause of this trend may have been the sudden deceleration of capacity expansion during the 1980s as a result of the external payment crisis and its adverse effects on manufacturing output through supply and demand constraints. India, Singapore and, to a lesser extent, Hong Kong, are notable exceptions to this general trend. These economies stayed more or less on the course set during the 1970s. Although the structure of the economy in terms of openness to external trade is vastly different between India, Singapore and Hong Kong, one important factor common to all three economies may explain their performance. They limited their financial vulnerability to the debt burden by avoiding a debt-financed investment strategy and relying on other sources of finance, such as foreign direct investment in the cases of Singapore and Hong Kong, and official development assistance and domestic resources in the case of India. Chile and Zimbabwe also recorded a rather small potential output gap, but for different reasons. Zimbabwe's case was explained earlier. Chile's estimated gap may be substantially smaller than its actual size because of the possible underestimation of industry elasticities of output in relation to investment, from which the output gap was computed.

The well-established paradigm of dynamic comparative advantage maintains that an economy moves through different stages of industrialization over time: labour-intensive, technologically simple light manufacturing and agrofood processing in the first phase of industrialization; capital-intensive basic goods and technologically sophisticated capital goods production in the second stage; and knowledge- and information-intensive high-technology products in the last phase. Most selected developing countries are in the second phase of industrialization, in which the development of basic and capital goods industries becomes critically important in broadening the industrial base and fostering industrial maturity. The empirical evidence seems consistent with this theory of stages. The cases of Brazil, Mexico, the Republic of Korea and Turkey all confirm the far greater potential output gap, in both absolute and relative terms, in capital goods and basic industries than in any other industry group. Even in Singapore, the capital goods industry is the only industry with a potential output gap, although relatively small. Such large output gaps may reflect the priority accorded to investment in the development of these industries in the late 1970s and the reversal of this policy forced by external shocks in the early 1980s.

As noted earlier, however, the potential output gap could disguise the relative performance of different countries. For instance, despite its large potential output gap of 52 per cent in the capital goods industry, the Republic of Korea's capital goods production grew at a rapid pace of approximately 20 per cent per year between 1980 and 1984. By contrast, against a potential output gap of 57 per cent, Brazil's actual performance in the capital goods industry has been erratic. Its 1981 output in this industry increased sharply by about 30 per cent over the previous year, only to drop with equal abruptness to 13 per cent the following year, falling further to a growth rate of −18 per cent in 1983 and rising to a meagre growth of 1 per cent in 1984.

The empirical results also point to the existence of great potential for expanding output in resource-based industries in some countries. For instance many countries producing agricultural commodities showed a substantial potential for expanding output in the agrofood industry in both absolute and relative terms. Most notable among this group are Colombia (coffee), Malawi (tobacco, tea and sugar) and some oil-exporting countries like Ecuador (coffee and bananas) and Venezuela (cereals, sugars and vegetable oils). In Venezuela the agrofood industry failed to expand because agriculture is the weakest and most neglected sector in that country, despite its considerable potential. There also remained untapped potential in mineral-based basic industries (including oil) in some mineral-rich countries, notably Ecuador, Kuwait, Tunisia and Venezuela, in addition to some selected developing countries (Brazil, Mexico and Turkey). Much of the blame can be placed on the general

Figure XVIII. Actual and potential output of



Industries in various developing countries and areas

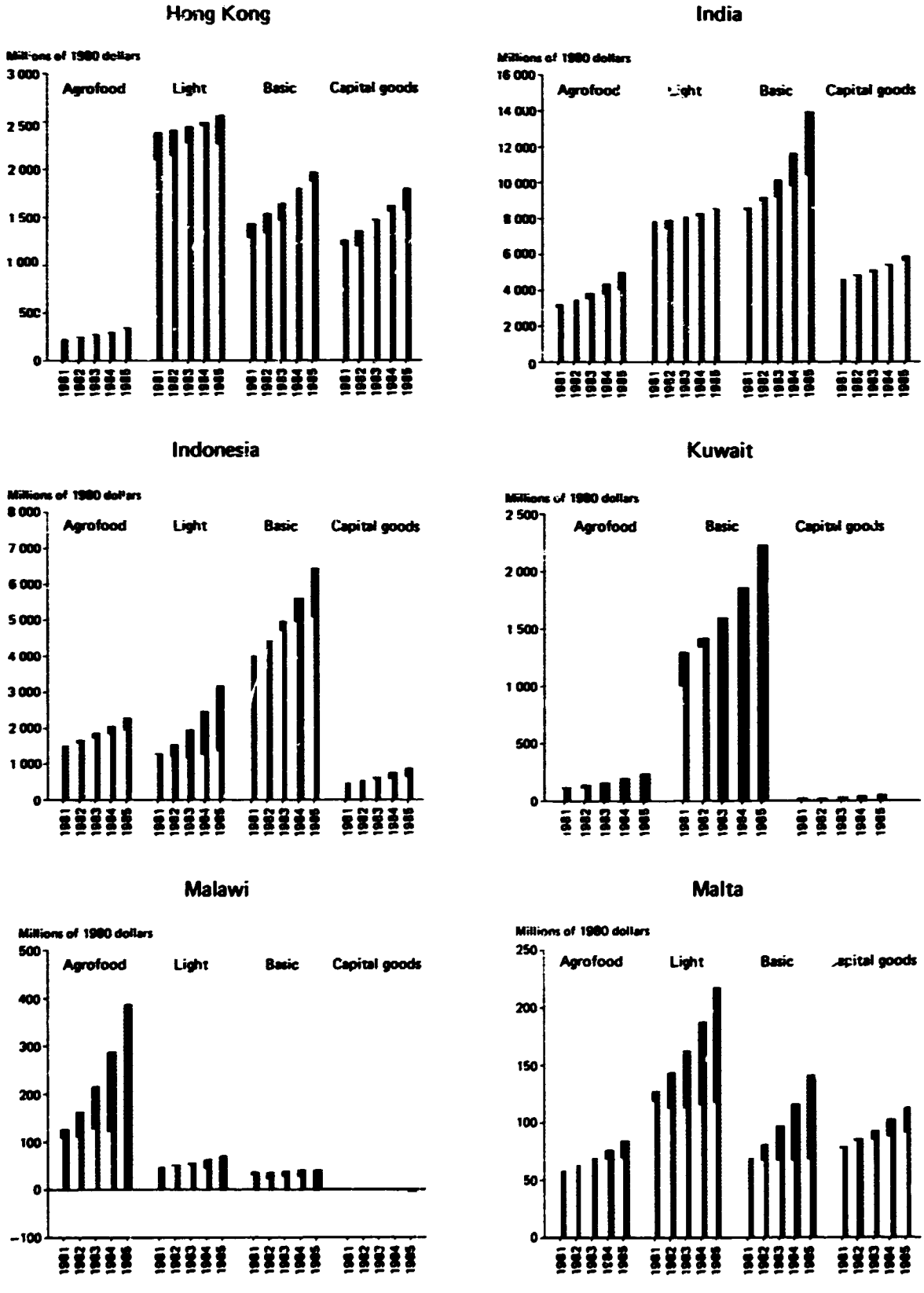


Figure XVIII *(continued)*

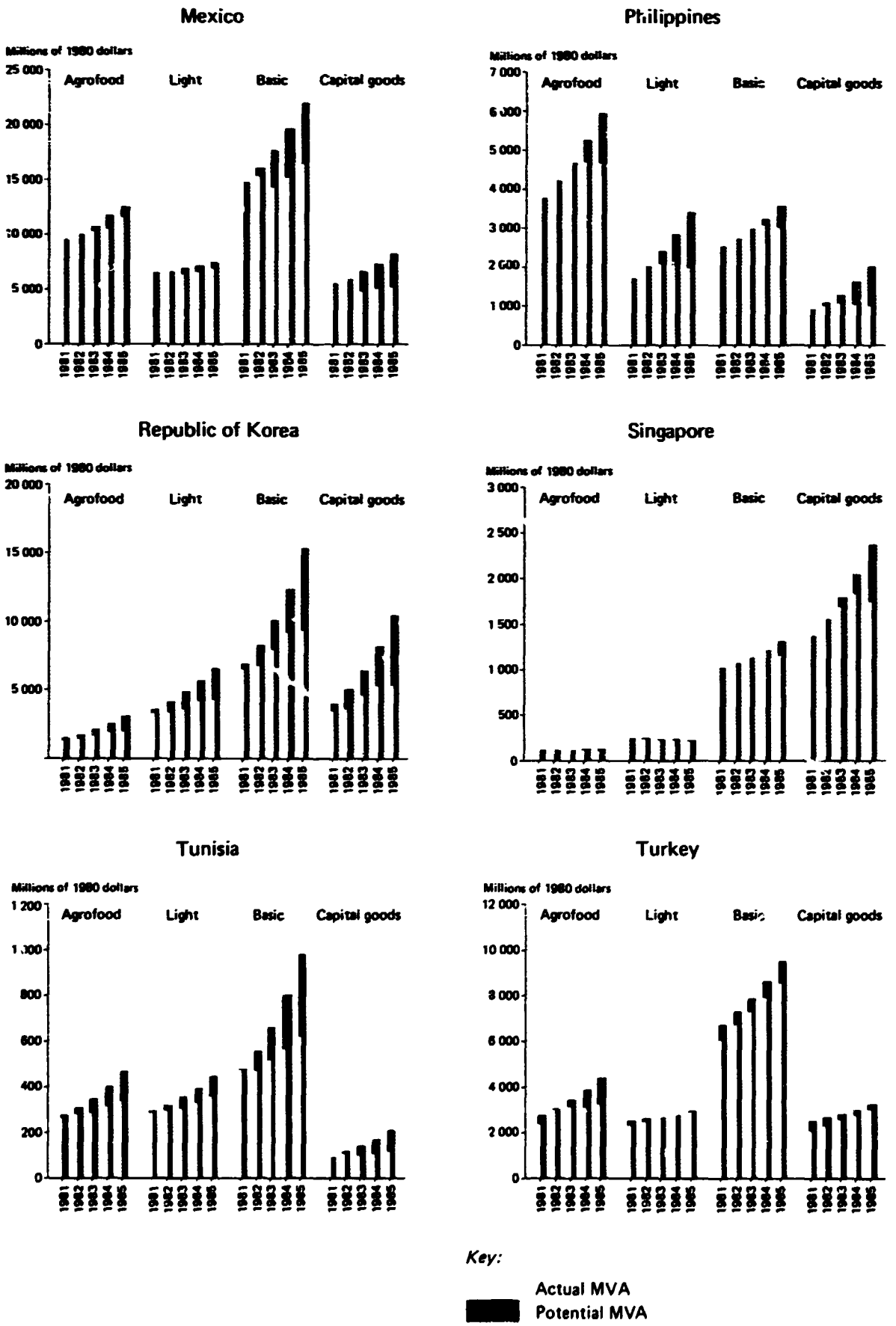
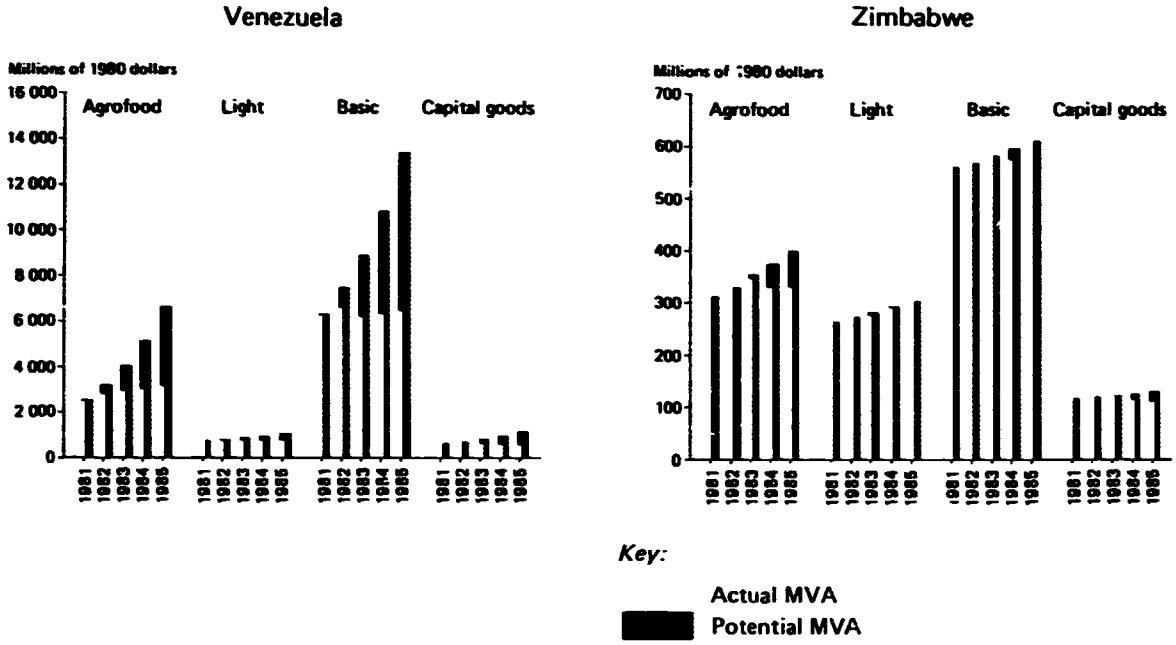


Figure XVIII *(continued)*



Source: UNIDO/SR/GLO estimates.

continuous slide in commodity prices as well as a marked slow-down in capacity expansion in these resource-based industries during the 1980s.

Considerable unexploited potential likewise remained in light industry in some countries and areas with comparative advantage in labour-intensive manufacturing, such as Hong Kong and Indonesia and the Philippines. In particular, the rapid growth of Hong Kong largely depended on success in exporting light manufactured products—textiles, plastics and electronic products. Light industry accounted for approximately 67 per cent of Hong Kong's total industrial workforce and 75 per cent of its total exports in 1983. Given the dominance of light industry in the economy of Hong Kong, a 10 per cent output gap in this industry seems somewhat modest in view of the industry's sluggish performance in 1981-1985.

With regard to the employment implications of industry output foregone during the period, and the absence of country- and industry-specific data on the relationship between employment and output, employment coefficients (employment per unit of manufacturing output) were estimated by least squares fitted to time-series data on industry MVA and employment for the sample countries. These estimated employment coefficients were then used to convert industry output foregone into an employment equivalent. Most of the estimated employment coefficients were statistically significant.* These coefficients differed markedly between countries and sectors, reflecting the differences in underlying production technology, factor proportions, product mixes and institutional and policy variables. The cumulative results for potential employment foregone in four major manufacturing groups during the 1981-1985 period are summarized in table 41. There are many similarities between the output and employment gaps. Some of the most notable findings are as follows:

(a) There is a steadily widening gap between actual and potential employment over time in all countries and areas except Chile, Hong Kong, Singapore, Turkey and Zimbabwe;

(b) The dominant industry contributing to the potential employment gap also differed substantially between countries and areas and different periods within the same country or area, without showing any regional pattern or recurring characteristics. Basic industries account for a major share of the year-to-year potential employment gap in Brazil, Cyprus, Ecuador, Egypt, India, Mexico, Tunisia and Venezuela; capital goods industry in the Republic of Korea and Singapore; light industry in Hong Kong, Indonesia, Malawi, Malta and the Philippines; and agrofood industry in Chile, Colombia and Zimbabwe;

(c) The sectoral pattern of cumulative potential employment follows closely that of potential output. The cumulative results for 1981-1985 suggest that the greatest potential for employment expansion exists in basic industries in countries with significant natural resources, notably Brazil, Ecuador, Egypt, India, Mexico, Tunisia, Turkey and Venezuela. In the capital goods industry, the employment gap in both absolute and relative terms was widest in the Republic of Korea and to a lesser extent in Brazil, Mexico, the Philippines and Turkey. This may reflect the determined effort of those countries to develop their capital goods industry in the late 1970s;

(d) Sizeable additional employment could also have been generated in agrofood and light industries in various countries. High employment potential was found in many countries where the agrofood industry is an important branch of the economy, including Chile, Colombia, Egypt, Indonesia, Tunisia, Turkey and Venezuela. Likewise, considerable employment potential existed in the light industry, particularly in countries and areas where light manufacturing is relatively important, such as Ecuador, Egypt, Hong Kong, Indonesia and the Philippines. It is interesting to note India's small employment gap in this industry, despite its highly labour-intensive technology. The reason for this may be the high investment priority accorded by India to light industry in the early 1980s (see appendix II, table 43).

*Available in an unpublished technical paper.

Table 41. Cumulative potential manufacturing employment foregone in various developing countries and areas, 1981-1985

Country or area	Total manufacturing employment loss		Agrofood industry			Light industry			Basic industry			Capital goods industry		
	Thousands of potential employment foregone	Percentage of 1985 actual employment	Thousands of potential employment foregone	Percentage of 1985 actual employment		Thousands of potential employment foregone	Percentage of 1985 actual employment		Thousands of potential employment foregone	Percentage of 1985 actual employment		Thousands of potential employment foregone	Percentage of 1985 actual employment	
Brazil	1 918.7	37.5	302.4	37.9	(15.76)	439.6	30.6	(22.91)	861.4	50.1	(44.89)	315.4	27.1	(16.44)
Chile	23.0	15.5	20.1	49.2	(87.40)	−0.6	−1.8	(−2.60)	1.6	2.6	(7.00)	1.9	15.9	(4.30)
Colombia	207.7	43.8	92.3	81.0	(44.40)	20 5	15.8	(9.90)	64.6	36.2	(31.10)	30.3	58.5	(14.60)
Cyprus	10.3	26.5	1.6	22.2	(15.50)	3.0	15.3	(29.10)	5.5	55.3	(53.40)	0.2	9.3	(1.90)
Ecuador	52.1	35.1	10.3	21.8	(19.80)	16.8	38.8	(32.20)	21.4	42.8	(41.10)	3.8	44.1	(7.30)
Egypt	488.9	46.0	125.4	54.9	(25.60)	106.4	27.1	(21.80)	184.9	53.7	(37.80)	72.2	74.6	(14.80)
Hong Kong	99.8	11.8	2.3	10.4	(12.30)	62.8	15.9	(62.90)	12.3	5.8	(12.30)	22.3	10.4	(22.30)
India	547.7	7.2	110.2	5.6	(20.10)	27.8	1.6	(5.10)	355.4	14.4	(64.90)	54.3	3.7	(9.90)
Indonesia	300.7	25.6	60.6	17.4	(20.10)	210.1	53.9	(69.90)	19.6	6.0	(6.50)	10.4	9.4	(3.50)
Kuwait[a]	2.4	7.0	1.2	14.6	(50.00)	—			0.6	2.8	(25.00)	0.7	17.1	(25.00)
Malawi[b]	1.0	2.5	0.0	0.0	(0.00)	0.6	6.7	(60.00)	0.3	4.9	(40.00)	—	—	
Malta	3.2	11.6	0.1	1.9	(3.10)	1.7	11.3	(53.10)	1.0	18.8	(31.30)	0.5	11.7	(15.60)
Mexico	421.6	24.4	29.9	7.9	(7.10)	25.1	7.4	(6.00)	259.5	37.1	(61.60)	107.1	34.2	(25.40)
Philippines	662.9	58.0	33.5	10.8	(5.10)	408.3	90.6	(61.60)	24.4	9.5	(3.70)	196.7	154.8	(29.70)
Republic of Korea	498.5	22.5	44.9	23.8	(9.00)	112.4	14.5	(22.50)	99.5	13.6	(20.00)	241.7	46.5	(48.50)
Singapore	7.4	2.6	0.0	0.2	(0.00)	1.6	3.2	(21.60)	−1.6	−2.0	(−21.6)	7.4	5.2	(100.00)
Swaziland[a]	−0.2	−2.1	−0.7	−14.6	(350.00)	0.4	12.0	(−200.00)	0.1	3.7	(−50.00)	—	—	
Togo[b]	0.3	6.6	0.0	0.0	(0.00)	0.0	0.0	(0.00)	0.3	9.9	(100.00)	—	—	
Tunisia	46.6	29.0	17.2	62.0	(36.90)	4.5	8.1	(9.70)	20.9	31.8	(44.80)	3.9	35.7	(8.40)
Turkey	251.2	26.7	64.8	34.2	(25.80)	26.0	10.3	(10.40)	96.0	29.5	(38.20)	64.4	37.1	(25.60)
Venezuela	405.9	76.8	114.6	82.2	(28.20)	20.6	22.1	(5.10)	229.1	96.2	(56.40)	41.7	72.3	(10.30)
Zimbabwe	−11.8	−6.3	4.1	9.9	(34.70)	−11.5	−18.9	(97.50)	−4.5	−6.7	(38.10)	0.1	0.7	(−0.80)

Note: Figures in parentheses represent percentage shares of total loss.

[a] 1981-1982 cumulative sum.

[b] 1981-1984 cumulative sum.

STATISTICAL TABLES

Table 42. Annual growth rates of manufacturing capital stock[a] in various developing countries and areas

Country or area and industry	1980 cumulative investment (millions of dollars)	Percentage growth rates based on 1980 constant dollars						
		1975-1980	1980	1981	1982	1983	1984	1985
Latin America								
Brazil								
Agrofood	8 830.6	23.11	15.85	11.46	...	...	...	...
Light	7 204.6	18.51	13.84	12.53	...	...	...	...
Basic	27 774.6	23.34	15.76	14.83	...	...	...	...
Capital goods	14 074.1	24.69	13.55	10.44	...	..	...	...
Total	59 467.0	23.20	15.12	13.34	...	...	...	...
Chile[b]								
Agrofood	430.1	70.39	63.55	45.87	19.47	10.83	7.07	...
Light	190.6	75.30	28.31	20.64	13.12	8.60	5.95	...
Basic	1 005.8	62.90	22.48	28.46	17.91	14.81	12.24	...
Capital goods	104.1	41.30	36.01	16.34	17.21	9.92	10.70	...
Total	1 733.0	63.71	32.16	31.24	17.94	12.80	10.12	...
Colombia								
Agrofood	1 085.0	23.51	17.85	13.58	9.57	10.64	12.84	...
Light	967.2	13.72	13.34	9.44	9.90	13.38	9.46	...
Basic	2 774.8	19.04	12.54	7.13	11.09	16.41	15.65	...
Capital goods	403.4	21.33	20.34	12.20	16.03	13.85	5.12	...
Total	5 274.8	18.91	14.28	9.30	10.88	14.59	12.98	...
Ecuador								
Agrofood	1 001.7	24.55	18.79	13.82	9.95	8.10	...	...
Light	454.8	21.14	17.55	23.87	11.36	10.52	...	...
Basic	779.3	25.30	20.08	29.10	14.69	12.66	...	...
Capital goods	114.3	32.33	20.48	44.32	26.10	4.22	...	...
Total	2 364.2	24.33	18.97	22.41	12.78	9.95	...	...
Mexico								
Agrofood	1 542.6	18.09	14.58	16.33	22.64	11.41	9.88	...
Light	765.0	13.30	12.21	17.08	11.07	13.87	9.41	...
Basic	8 957.4	22.03	8.27	13.01	13.04	11.61	8.03	...
Capital goods	1 084.3	22.35	30.26	21.89	21.89	7.81	10.53	...
Total	12 385.8	20.75	10.88	14.41	14.92	11.32	8.59	...
Venezuela[c]								
Agrofood	1 322.4	35.54	31.04	...	34.07	22.39	14.28	...
Light	651.0	20.98	23.90	...	14.50	13.31	7.31	...
Basic	10 765.7	31.86	19.60	...	10.31	18.66	10.43	...
Capital goods	831.8	33.92	60.01	..	16.07	16.89	8.36	...
Total	13 602.5	31.72	22.74	...	13.18	18.70	10.62	...
Asia								
Hong Kong[d]								
Agrofood	192.8	25.05	26.83	23.66	16.22	20.54	19.12	...
Light	1 904.2	39.83	19.25	17.14	13.16	6.36	7.75	...
Basic	1 204.4	22.79	43.37	27.48	18.71	14.46	10.42	...
Capital goods	823.5	25.38	47.46	29.75	20.33	16.37	13.03	...
Total	4 224.4	25.66	30.87	22.94	16.48	11.65	10.38	...
India[e]								
Agrofood	1 206.2	25.05	31.67	22.51	21.22	19.05	...	...
Light	1 904.0	39.83	49.52	43.43	27.49	26.10	...	...
Basic	6 996.6	22.79	52.50	36.26	35.86	22.40	...	...
Capital goods	2 860.9	25.38	28.38	23.68	24.15	22.80	...	...
Total	12 657.7	35.84	43.86	33.01	30.98	22.69	...	...
Indonesia								
Agrofood	1 522.5	13.02	4.82	6.18	5.67	11.31	10.31	11.75
Light	2 891.2	35.29	30.75	8.80	7.51	10.59	10.06	11.34
Basic	1 930.1	23.57	20.31	15.89	19.10	26.37	19.90	12.05
Capital goods	495.7	26.59	15.75	12.88	15.62	28.34	23.32	15.83
Total	6 867.5	24.48	20.06	10.52	11.11	17.08	14.60	12.05

Table 42 (continued)

Country or area and industry	1980 cumulative investment (millions of dollars)	Percentage growth rates based on 1980 constant dollars					
		1975-1980	1980	1981	1982	1983	1984	1985
Asia (continued)								
Philippines								
Agrofood	1 569.5	15.60	13.60	18.54	10.14	...	...	...
Light	1 425.4	22.80	19.69	14.63	15.35	...	...	...
Basic	2 576.7	13.38	11.11	18.15	13.06	...	...	...
Capital goods	661.5	29.56	29.72	32.87	7.50	...	...	...
Total	6 247.8	17.14	15.40	19.00	12.16	...	..	...
Republic of Korea								
Agrofood	3 385.8	22.86	31.40	14.53	12.10	10.52	12.96	...
Light	8 339.6	21.10	17.25	8.44	8.70	6.80	6.16	...
Basic	15 228.1	25.52	33.75	21.32	15.12	16.65	8.09	...
Capital goods	7 141.5	38.45	29.01	17.10	16.43	13.00	10.27	...
Total	34 453.0	26.06	28.04	16.52	13.63	13.12	8.66	...
Singapore								
Agrofood	220.4	17.01	18.61	19.14	17.00	15.58	15.09	19.76
Light	495.4	11.90	14.21	13.13	8.76	6.93	4.82	5.44
Basic	1 318.8	19.51	21.05	21.03	22.97	22.47	17.51	12.54
Capital goods	1 638.1	20.00	20.67	18.89	17.10	18.02	13.80	13.45
Total	4 556.6	15.26	19.25	18.81	15.68	15.30	12.15	10.73
North Africa and Western Asia								
Cyprus								
Agrofood	148.4	18.49	13.11	11.19	5.95	8.16	6.78	7.27
Light	113.2	13.07	13.55	11.31	11.38	9.77	9.87	9.37
Basic	315.1	19.73	18.64	13.62	9.03	8.22	4.42	4.81
Capital goods	34.3	20.29	20.72	10.00	10.64	7.19	5.13	4.92
Total	615.1	27.15	16.37	12.36	8.81	8.44	6.10	6.32
Egypt								
Agrofood	1 339.0	28.44	19.66	19.2[illegible]	11.71	...	...	...
Light	2 389.7	22.00	13.55	1[illegible]9	15.88	...	...	...
Basic	6 396.8	21.95	16.54	16.44	16.57	...	...	...
Capital goods	1 109.3	25.63	15.49	20.94	19.16	...	...	...
Total	11 249.5	22.98	16.14	17.63	16.09	...	...	...
Kuwait								
Agrofood	175.9	29.82	23.28	23.96	15.60	16.15	...	...
Light	23.1	22.20	15.25	8.18	12.84	8.20	...	...
Basic	1 059.4	43.88	19.56	13.86	19.73	12.97	...	...
Capital goods	24.7	25.37	21.81	7.96	6.44	16.51	...	...
Total	1 283.8	40.24	20.01	15.02	18.75	13.41	...	...
Malta								
Agrofood	42.8	14.65	10.30	17.77	15.21	11.23	6.78	...
Light	69.8	22.37	12.93	9.16	7.54	8.50	3.35	...
Basic	80.1	23.43	8.63	7.78	5.60	5.58	9.80	...
Capital goods	44.6	12.34	27.63	4.50	11.12	15.89	13.92	...
Total	242.2	20.35	13.27	9.28	9.02	9.38	8.01	...
Tunisia								
Agrofood	325.4	30.94	18.72	16.25	17.71	...	...	..
Light	281.6	22.75	11.45	11.33	16.49	...	...	...
Basic	1 050.4	32.96	32.27	27.81	20.77	...	...	...
Capital goods	83.8	24.09	18.78	16.62	17.87	...	...	...
Total	2 080.1	30.16	26.46	19.71	17.83	...	...	...
Turkey								
Agrofood	1 218.8	20.78	10.16	8.62	6.80	10.36	13.80	...
Light	2 552.8	17.08	15.29	7.14	6.44	7.42	9.09	...
Basic	6 817.1	14.99	11.75	6.86	7.71	7.60	9.50	...
Capital goods	1 713.3	17.94	13.31	8.10	6.46	10.74	9.50	...
Total	12 353.2	16.32	12.50	7.24	7.17	8.27	9.86	...
Tropical Africa								
Malawi[f]								
Agrofood	301.6	38.64	2.80	0.86	4.38	2.32	1.88	...
Light	84.2	26.19	3.75	3.01	2.26	4.57	17.57	...
Basic	113.7	14.26	9.06	4.15	3.33	2.50	2.55	...
Capital goods	6.3	15.36	8.44	15.69	7.56	3.10	2.66	...
Total	505.8	28.47	4.37	2.14	3.83	2.74	4.68	...

Country or area and industry	1980 cumulative investment (millions of dollars)	Percentage growth rates based on 1980 constant dollars						
		1975-1980	1980	1981	1982	1983	1984	1985
Swaziland[d]								
Agrofood	54.2	14.36	14.67	164.42	12.30	10.87	...	...
Light	136.7	27.05	5.41	0.56	3.08	0.61	...	...
Basic	25.1	1.87	2.55	57.19	19.76	47.63	...	...
Capital goods	—	—	—	—	85.61	112.73	...	...
Total	236.2	20.23	7.43	44.16	8.74	11.07	...	...
Togo[d]								
Agrofood	31.1	24.15	10.54	31.20	29.28	2.77	...	...
Light	10.0	8.96	2.48	2.71	3.29	3.24	...	...
Basic	13.4	84.12	48.19	3.22	71.09	18.83	...	...
Capital goods	—	—	—	—	—	—	...	...
Total	63.5	21.81	13.57	16.37	29.87	6.51	...	...
Zimbabwe								
Agrofood	441.8	14.43	7.72	13.62	13.17	8.89	...	...
Light	277.6	14.75	4.90	17.31	23.85	9.68	...	...
Basic	1 102.5	12.28	3.44	8.42	8.65	7.19	...	...
Capital goods	83.2	13.37	8.33	13.64	14.81	10.75	...	...
Total	1 905.2	13.16	4.83	11.15	12.33	8.18	...	...

Source: UNIDO data base.

[a]Estimated by cumulative investment.

[b]Cumulative sums start from 1975, and hence may substantially overestimate growth rates because of a small base and underestimate actual capital stock.

[c]Average growth rate of 1977-1980 and 1982-1984.

[d]Average growth rate of 1977-1980.

[e]Average growth rate of 1979-1982, cumulative sums start from 1978 and underestimate actual capital stock.

[f]Average growth rate of 1973-1976.

Table 43. Growth rates of manufacturing investment in various developing countries and areas: three-year moving averages

(Percentages, based on 1980 constant dollars)

Country or area and industry	1975	1976	1977	1978	1979	1980	1981	1982	1983
Brazil									
Total	14.99	7.57	7.21	−3.26	−0.69	...	...	...	...
Agrofood	16.80	1.73	10.18	−1.76	−2.80	...	...	...	...
Light	−0.40	−9.41	−4.48	−3.94	8.74	...	...	...	...
Basic	10.80	11.53	7.97	2.77	1 55	...	...	...	...
Capital goods	30.70	9.05	8.91	−15.38	−9.26	...	...	...	...
Chile									
Total	−39.32	6.13	−11.84	24.56	36.98	7.32	−5.72	−18.18	...
Agrofood	12.60	23.32	38.35	57.74	44.71	7.23	−17.66	−34.59	...
Light	−40.51	81.89	72.14	17.84	−3.65	−22.80	−17.64	−24.51	...
Basic	−40.15	0.28	−36.67	8.55	48.02	15.59	5.84	−9.71	...
Capital goods	−68.06	−29.52	26.69	32.71	22.39	−5.33	−20.61	−0.60	...
Colombia									
Total	16.49	35.25	10.61	−0.85	−16.23	4.66	15.37	22.44	11.30
Agrofood	78.32	37.91	10.22	0.30	−4.43	−2.17	−4.79	10.87	14.21
Light	−18.51	15.88	36.59	10.09	−4.88	−4.20	13.52	9.49	4.93
Basic	12.28	43.76	5.62	−5.98	−27.48	10.28	27.83	37.76	16.31
Capital goods	22.75	8.99	6.86	12.99	−0.12	16.13	2.38	−9.55	−22.63
Cyprus									
Total	−2.99	24.73	31.43	17.08	−5.21	−11.97	−10.32	−13.12	−3.56
Agrofood	−7.52	30.62	30.01	18.28	−5.81	−12.95	−6.71	−9.29	13.17
Light	28.82	43.41	18.23	−2.30	−9.33	−0.65	0.50	5.87	3.52
Basic	−9.46	10.28	36.82	25.49	−1.52	−14.77	−13.95	−22.59	−13.37
Capital goods	−3.16	96.33	38.58	9.94	−21.67	−10.60	−21.66	−10.87	−18.29
Ecuador									
Total	15.47	11.36	11.59	11.41	19.63	1.75	−4.09	...	...
Agrofood	31.31	13.27	15.58	6.47	−0.37	−7.57	−13.88	...	...
Light	1.92	−1.18	−4.54	18.70	36.84	1.67	−0.78	...	...
Basic	5.41	20.95	18.72	15.95	27.23	5.24	3.11	...	...
Capital goods	29.50	−1.40	−2.93	3.11	73.62	30.29	−9.41	...	...

Table 43 (continued)

Country or area and industry	1975	1976	1977	1978	1979	1980	1981	1982	1983
Egypt									
Total	7.56	0.86	9.58	14.30	11.13	5.62	13.44	5.89	5.21
Agrofood	23.92	14.12	−4.15	15.13	10.14	−0.13	−5.08	−14.26	−5.36
Light	−9.46	9.10	26.28	16.92	7.93	−1.77	20.32	9.57	15.23
Basic	10.95	−8.62	5.47	12.55	12.40	10.04	13.26	6.42	4.10
Capital goods	4.16	38.36	19.74	17.19	12.85	5.46	19.20	3.84	1.04
Hong Kong									
Total	58.13	46.49	33.40	6.53	8.55	0.57	−10.34	−10.60	...
Agrofood	...	...	...	7.46	−9.58	−7.13	12.89	12.93	...
Light	41.18	10.14	8.99	−11.80	8.44	−3.46	−15.84	−15.15	...
Basic	...	...	...	20.30	10.38	2.65	−10.27	−12.38	...
Capital goods	...	...	...	24.07	11.90	4.66	−7.50	−7.45	...
India									
Total	...	...	...	...	2.99	1.57	8.59	...	...
Agrofood	...	...	...	...	−15.94	−13.69	5.83	...	...
Light	...	...	...	...	8.46	6.94	12.60	...	...
Basic	...	...	...	...	4.86	14.02	5.88	...	...
Capital goods	...	...	...	...	3.61	−26.99	17.06	...	...
Indonesia									
Total	8.68	7.81	47.54	20.84	2.84	−20.78	10.78	23.94	13.96
Agrofood	−1.02	18.68	0.58	−21.90	−25.63	−12.33	48.20	26.87	32.18
Light	12.08	6.94	118.29	38.07	3.03	−38.28	−27.48	14.36	23.76
Basic	10.36	−0.39	29.44	23.39	16.37	4.02	35.54	25.28	3.29
Capital goods	20.77	11.07	0.13	4.70	−2.36	6.21	52.99	38.79	16.09
Kuwait									
Total	5.37	23.77	258.53	19.36	8.50	−32.98	3.08	...	...
Agrofood	28.66	−26.61	98.24	13.27	35.69	−14.72	6.85	...	...
Light	1.54	44.30	40.80	−0.15	−12.75	−9.95	−9.15	...	...
Basic	−9.05	55.50	330.38	21.40	5.56	−36.26	2.51	...	...
Capital goods	99.98	−10.48	−6.57	−44.43	22.35	11.63	3.27	...	...
Malta									
Total	29.10	32.61	−0.92	−6.27	−15.31	0.78	−1.75	3.84	00.37
Agrofood	6.45	23.62	43.80	−3.69	22.00	6.49	13.12	−14.80	−17.09
Light	91.95	19.37	8.79	−26.29	−6.32	−7.77	−5.08	−17.86	−17.49
Basic	9.86	46.09	−23.46	−6.83	−35.33	−5.39	−7.32	19.83	15.27
Capital goods	12.32	39.81	5.69	41.06	−25.10	16.13	−8.47	41.15	16.28
Mexico									
Total	19.03	27.75	11.86	−5.05	−4.62	8.74	12.28	−3.96	4.79
Agrofood	12.99	2.42	−6.82	9.04	18.37	39.41	6.42	−1.05	−1.58
Light	−10.59	13.99	1.28	−9.05	20.36	12.92	17.48	−6.53	21.91
Basic	22.43	38.68	19.19	−9.76	−13.51	−3.49	20.35	−3.66	6.07
Capital goods	24.71	−3.28	−23.82	28.54	36.81	46.80	−16.20	−8.34	−12.37
Philippines									
Total	1.31	2.81	3.26	17.93	28.34	4.21	1.17	...	...
Agrofood	−14.74	12.92	2.96	19.96	20.77	1.37	−0.56	...	...
Light	10.04	−4.18	−6.83	19.49	22.00	7.23	−1.89	...	...
Basic	4.39	−0.11	4.73	6.26	31.40	13.25	13.08	...	...
Capital goods	9.15	11.93	23.66	46.04	42.99	−13.53	−19.96	...	...
Republic of Korea									
Total	1.65	14.75	16.65	28.48	9.24	2.77	−8.33	−7.14	−6.86
Agrofood	−0.48	8.54	11.72	40.71	9.94	4.74	−19.88	9.22	8.65
Light	−9.87	5.84	9.57	6.73	−9.82	−9.34	−20.58	−2.64	−9.06
Basic	−0.53	19.42	22.59	43.86	19.09	7.38	−3.04	−12.92	−9.82
Capital goods	23.97	19.14	15.21	20.80	6.61	1.05	−8.10	−2.37	−7.01
Singapore									
Total	−17.18	3.37	7.22	31.80	27.46	19.64	9.11	0.75	0.76
Agrofood	−19.15	6.94	17.85	29.16	23.61	14.69	10.95	8.44	24.73
Light	−10.89	−21.86	17.13	27.38	19.37	−1.29	−11.03	−21.52	−9.76
Basic	1.16	5.09	5.16	26.66	26.34	31.94	24.23	13.23	−1.01
Capital goods	0.62	2.11	3.06	20.59	20.08	19.56	14.14	5.87	7.09
Swaziland									
Total	...	...	...	−30.15	34.57	1.44	16.40	...	...
Agrofood	...	...	...	1.29	460.63	12.87	9.29	...	...
Light	...	...	...	−35.45	−78.97	−18.43	−51.22	...	...
Basic	...	...	...	14.10	1 027.74	48.63	96.06	...	...
Capital goods	...	...	...	...	...	...	...	...	...

Country or area and industry	1975	1976	1977	1978	1979	1980	1981	1982	1983
Togo									
Total	...	46.85	5.45	14.26	−6.58	51.12	−3.36	...	...
Agrofood	...	...	26.30	19.44	21.41	36.57	−6.12	...	...
Light	...	...	−29.56	−38.90	−28.95	−47.22	11.95	...	...
Basic	...	...	5.30	53.48	−38.96	112.87	0 67	...	...
Capital goods	...	...	...	...	...	...	...	...	...
Tunisia									
Total	29.96	45.84	14.06	19.11	14.93	0.54	...	...	...
Agrofood	24.55	29.39	34.63	10.05	2.26	−3.26	13.63	...	...
Light	12.34	37.15	0.65	−0.92	−15.68	15.97	21.13	...	...
Basic	38.11	49.71	20.01	27.49	16.39	18.53	4.35	...	...
Capital goods	−19.44	37.94	20.94	11.29	3.09	10.86	15.23	...	...
Turkey									
Total	−3.96	5.73	−0.84	4.62	−10.54	−10.26	−6.15	20.58	26.07
Agrofood	0.34	23.11	8.40	0.97	−16.30	−24.34	11.09	32.29	44.09
Light	−2.72	−10.91	4.68	8.26	−2.96	−15.50	−17.59	17.75	23.15
Basic	−6.97	6.05	−9.82	3.95	−11.48	−1.11	−6.89	20.59	21.90
Capital goods	6.01	23.84	21.33	4.99	−12.79	−20.59	2.28	14.59	29.44
Zimbabwe									
Total	−6.03	−22.12	−39.16	−26.88	25.81	43.43	19.04	−8.65	−17.35
Agrofood	2.34	−25.63	−35.06	−14.02	39.73	30.19	11.93	−1.24	−6.55
Light	7.04	−19.71	−51.13	−28.63	78.87	93.94	18.80	−6.37	−22.38
Basic	−12.21	−21.65	−38.34	−33.63	6.37	33.00	24.34	−15.05	−22.81
Capital goods	−1.11	−17.57	−23.91	−3.56	19.28	35.71	16.59	−4.14	−10.75

Source: UNIDO data base.

Table 44. Import shares of broad commodity groups in various developing countries and areas

Country or area	Total imports in millions of dollars	Percentage shares of commodity groups						
		Food and beverages	Industrial supplies	Fuels	Machinery	Transport	Consumer goods	Goods not elsewhere specified
Africa								
Central African Republic								
1978	5 503.06	15.9	25.5	0.9	16.2	23.6	17.7	0.1
1979	6 960.56	15.6	27.2	1.4	20.0	22.3	13.0	0.5
1980	8 050.83	19.6	24.9	1.6	13.1	20.4	20.3	0.0
Ethiopia								
1978	52 212.36	4.4	31.8	11.8	17.9	18.9	15.2	0.1
1979	56 734.75	5.5	29.0	19.2	18.8	16.4	10.2	1.0
1980	72 139.83	6.2	29.2	24.7	17.4	12.8	9.1	0.6
1981	73 748.52	7.9	21.5	23.0	16.2	22.0	9.0	0.4
1982	78 705.76	8.0	25.1	24.4	18.9	14.0	9.4	0.2
Malawi								
1978	33 835.67	4.0	36.1	11.1	24.5	14.1	9.6	0.6
1979	39 786.70	4.8	37.8	13.8	18.0	14.6	10.6	0.5
1980	44 022.40	5.6	36.6	14.6	17.0	17.5	8.5	0.3
1981	35 008.74	6.5	41.7	16.2	15.6	9.6	9.7	0.7
Senegal								
1978	75 619.42	22.9	22.8	13.9	16.1	12.9	10.1	1.2
1979	93 129.32	22.2	23.6	16.3	14.1	11.4	11.1	1.3
1980	105 193.76	22.6	18.2	25.0	14.2	10.3	9.2	0.5
1981	86 061.01	26.0	18.0	30.2	10.9	7.4	7.1	0.5
Zambia								
1978	62 813.40	6.2	32.7	17.3	23.7	13.5	6.4	0.1
1979	74 995.00	7.3	32.4	17.6	21.1	14.4	6.9	0.2
Zimbabwe								
1978	59 199.78	1.3	34.1	22.6	15.0	10.7	6.6	9.7
1979	93 707.28	1.1	34.7	29.3	13.1	9.9	6.3	5.6

Table 44 (continued)

Country or area	Total imports in millions of dollars	Percentage shares of commodity groups						
		Food and beverages	Industrial supplies	Fuels	Machinery	Transport	Consumer goods	Goods not elsewhere specified
Asia								
Hong Kong								
1978	1 345 161.00	13.8	47.5	4.9	13.4	3.5	16.5	0.4
1979	1 713 735.70	12.0	46.6	5.7	14.4	4.0	16.9	0.4
1980	2 241 349.20	11.2	45.2	5.5	14.2	4.9	18.5	0.5
1981	2 468 015.00	10.9	41.8	7.9	14.6	4.7	19.8	0.5
1982	2 355 433.90	12.0	39.8	8.0	15.0	4.5	20.2	0.5
1983	2 400 888.70	11.4	41.3	6.6	16.2	3.2	20.8	0.4
1984	2 856 723.60	9.6	41.4	5.4	18.9	3.2	21.1	0.4
India								
1978	785 436.72	13.5	39.4	26.1	14.5	4.6	1.7	0.2
1979	1 014 176.40	8.8	39.0	33.2	13.2	3.9	1.6	0.4
1980	1 409 036.20	8.8	31.5	44.6	9.5	4.4	1.1	0.0
1981	1 565 440.60	7.9	33.9	43.6	11.4	2.0	1.2	0.0
Indonesia								
1978	6 690.40	17.1	34.6	8.4	21.9	13.7	4.0	0.4
1979	7 202.30	15.3	38.7	10.7	22.1	9.5	3.2	0.4
1980	10 834.40	11.9	36.1	15.7	21.4	11.6	3.0	0.3
1981	13 272.20	10.1	38.2	12.8	23.2	12.4	2.8	0.5
1982	16 858.90	6.4	32.3	21.0	26.4	11.4	2.2	0.4
1983	16 351.80	7.1	30.6	24.8	26.6	8.4	2.2	0.4
Philippines								
1978	5 143.40	5.7	32.5	21.1	17.6	10.7	2.5	9.9
1979	6 612.90	5.8	31.7	22.1	17.4	10.8	2.2	10.0
1980	8 295.20	5.5	28.3	28.3	16.1	8.7	1.9	11.2
1981	7 945.70	6.1	25.8	30.0	15.8	7.3	1.9	12.9
1982	8 255.30	7.2	28.8	26.4	17.1	5.3	2.1	13.1
1983	7 979.50	5.8	28.5	27.4	16.8	5.1	2.1	14.2
Republic of Korea								
1978	14 971.90	5.2	42.7	16.3	24.5	8.8	2.4	0.0
1979	20 338.60	6.0	42.7	18.5	23.9	6.4	2.3	0.2
1980	22 291.60	7.4	38.2	29.8	16.4	6.1	2.0	0.1
1981	26 131.40	9.7	35.4	29.7	16.0	7.1	1.8	0.2
1982	24 250.80	5.7	35.6	31.3	18.1	6.9	2.1	0.4
1983	26 192.00	5.0	36.9	26.5	19.9	8.9	2.5	0.4
1984	30 631.40	4.5	37.1	23.7	20.5	11.5	2.5	0.3
Singapore								
1978	1 304 844.60	7.6	30.2	23.9	19.3	8.4	9.4	1.2
1979	1 764 349.20	7.2	30.1	25.2	20.1	8.2	7.8	1.4
1980	2 358 926.60	5.9	27.8	28.6	19.7	8.3	8.2	1.3
1981	2 760 743.90	5.9	24.2	33.7	20.2	6.6	8.3	1.1
1982	2 816 767.00	6.0	23.5	33.6	20.5	6.7	8.7	1.0
1983	2 815 810.00	6.2	23.7	31.2	20.7	7.8	9.4	1.1
1984	2 871 182.80	7.5	23.8	27.7	22.7	7.3	9.7	1.2
Latin America								
Bolivia								
1978	768.70	13.1	23.4	0.9	31.1	17.4	12.8	1.2
1979	894.70	13.0	22.9	0.7	26.7	19.8	11.5	5.4
Brazil								
1978	14 538.00	8.7	29.4	32.5	23.3	3.6	2.3	0.2
1979	19 372.00	10.3	28.5	36.9	19.2	2.9	2.0	0.1
1980	24 961.00	8.2	27.0	43.0	15.7	4.5	1.6	0.1
1981	24 079.00	7.9	21.1	50.4	15.6	3.6	1.4	0.0
1982	21 069.00	8.3	18.6	53.4	14.6	3.3	1.7	0.1
1983	16 801.00	8.0	17.2	55.8	12.0	5.0	1.8	0.2
1984	15 210.00	8.8	20.8	52.7	11.5	4.7	1.4	0.2
Chile								
1978	3 002.40	14.6	24.6	16.6	19.9	11.4	10.5	2.5
1979	4 217.60	11.2	21.9	21.0	15.6	12.9	10.6	6.7
1980	5 123.70	13.1	22.5	18.3	15.7	14.9	11.9	3.6
1981	6 363.80	10.4	22.6	14.4	16.1	18.2	15.6	2.7
Colombia								
1978	2 836.30	8.9	37.2	7.2	22.0	14.9	4.4	5.3
1979	3 233.20	8.2	37.0	10.0	21.7	16.1	4.5	2.3
1980	4 662.60	9.2	35.1	12.1	23.4	15.0	4.4	0.8
1981	5 199.20	8.3	33.8	13.9	24.9	13.8	4.1	1.1

Country or area	Total imports in millions of dollars	Percentage shares of commodity groups						
		Food and beverages	Industrial supplies	Fuels	Machinery	Transport	Consumer goods	Goods not elsewhere specified
1982	5 477.70	8.5	34.4	12.1	24.5	15.6	4.2	0.7
1983	4 968.10	8.9	32.7	12.9	26.2	14.0	4.2	1.2
1984	4 052.00	8.1	39.5	10.4	24.6	11.7	3.7	2.0
Ecuador								
1978	1 627.30	6.3	31.9	0.7	30.5	20.1	8.3	2.2
1980	2 253.30	7.6	34.6	1.0	28.3	21.2	6.4	0.8
1981	2 246.10	5.6	27.9	12.9	29.4	17.6	6.2	0.3
1982	2 189.00	4.3	40.2	1.3	29.4	15.8	8.8	0.1
El Salvador								
1978	102 396.00	8.7	39.9	7.7	17.6	12.6	13.3	0.3
1979	101 196.00	10.1	41.1	9.3	14.7	9.7	14.9	0.2
1980	96 172.00	15.3	37.4	17.6	9.3	4.5	15.8	0.1
1981	98 456.00	13.7	38.4	20.7	8.2	4.8	14.2	0.1
1982	85 676.00	14.8	35.0	24.4	8.6	3.9	13.2	0.2
Mexico								
1978	778 658.16	8.2	40.0	2.7	27.1	17.7	4.1	0.1
1979	1 259 000.80	7.5	35.4	2.1	28.8	18.6	4.6	3.2
1981	2 416 091.10	8.6	26.3	1.4	23.6	16.4	4.4	19.2
1982	1 504 135.60	8.3	28.5	2.8	27.7	15.2	4.6	12.9
Nicaragua								
1978	59 394.90	8.3	38.7	15.1	13.7	11.0	13.0	0.2
1979	36 020.63	11.9	35.1	21.1	8.8	7.2	15.6	0.3
1980	88 719.96	13.0	37.2	19.8	7.9	7.0	15.1	0.1
1981	99 943.79	15.3	30.6	19.9	13.3	9.4	11.3	0.2
1982	77 554.84	10.3	31.3	23.1	15.2	10.2	9.8	0.1
Peru								
1978	127 227.49	15.9	36.8	5.3	27.8	9.1	4.6	0.6
1979	195 084.59	18.9	35.3	2.9	29.0	10.1	3.6	0.2
1980	306 164.25	17.5	34.8	2.0	27.2	13.3	4.8	0.5
1981	380 315.41	16.3	27.3	1.1	27.7	20.1	7.4	0.0
1982	378 819.49	14.8	31.7	1.5	27.6	16.4	8.0	0.1
Venezuela								
1978	1 062 292.50	10.5	28.1	0.2	32.2	20.0	8.9	0.1
1979	962 677.14	10.7	32.1	0.7	30.0	16.6	9.8	0.1
1980	1 067 068.30	11.2	33.7	1.0	28.0	14.3	11.6	0.2
1981	1 181 267.30	14.1	31.5	0.1	26.3	16.7	11.1	0.1
Middle East								
Cyprus								
1978	75 799.03	12.0	34.8	11.0	13.9	13.1	15.1	0.1
1979	100 911.50	11.5	38.7	12.5	12.7	9.3	15.1	0.1
1980	120 209.71	11.2	35.3	18.5	11.4	9.4	14.1	0.1
1981	116 524.50	12.8	34.1	21.6	10.7	6.8	13.9	0.1
1982	121 538.01	11.1	32.3	20.4	11.6	8.2	16.3	0.1
1983	121 913.87	12.3	31.2	18.8	10.5	9.3	17.8	0.1
1984	136 362.39	11.5	30.1	18.3	9.9	15.0	15.1	0.1
Egypt								
1978	672 674.50	19.8	36.6	1.4	20.3	15.2	6.7	0.1
1979	383 742.47	20.9	39.2	0.7	19.2	14.0	5.8	0.1
1980	485 999.51	26.6	40.6	1.0	17.0	10.4	4.4	0.1
1981	883 927.69	28.6	35.2	2.8	16.1	12.5	4.9	0.0
1982	907 805.45	24.8	37.1	4.0	17.0	11.7	5.3	0.1
Jordan								
1978	149 865.64	18.7	27.9	10.2	16.6	12.7	12.9	1.0
1979	196 177.94	17.4	31.1	12.6	12.8	13.3	12.3	0.3
1980	239 433.98	15.9	27.2	17.0	15.9	12.1	11.2	0.6
1981	314 907.83	15.1	24.1	17.4	12.3	20.8	10.2	0.2
1982	324 120.40	16.0	24.0	21.2	12.7	15.8	10.0	0.3
1983	303 000.38	15.1	25.8	19.4	13.9	9.6	11.6	4.7
1984	278 415.87	16.5	26.5	20.6	11.2	10.1	11.7	3.3
Kuwait								
1978	459 780.28	13.2	25.1	0.5	20.3	15.3	24.8	0.8
1979	520 370.75	13.8	27.5	0.7	15.2	16.9	24.8	1.1
1980	653 175.32	13.3	26.0	0.8	15.6	17.3	26.5	0.6
1981	696 892.86	13.3	25.4	0.5	18.8	19.3	22 4	0.4
1982	828 338.50	12.2	24.8	0.6	19.8	21.2	21.1	0.4

Table 44 (continued)

Country or area	Total imports in millions of dollars	Percentage shares of commodity groups						
		Food and beverages	Industrial supplies	Fuels	Machinery	Transport	Consumer goods	Goods not elsewhere specified
Middle East (continued)								
Malta								
1978	57 524.65	16.7	45.0	7.2	9.5	5.3	15.7	0.6
1979	75 957.63	15.8	45.4	6.3	10.7	5.6	15.1	1.1
1980	93 792.72	15.7	44.3	10.0	9.9	5.8	13.5	0.8
1981	85 499.13	14.2	40.6	13.4	11.9	5.9	13.2	0.9
1982	78 883.89	14.8	37.9	14.5	13.4	6.3	12.3	0.7
1983	73 250.16	12.7	37.8	11.9	11.5	11.9	13.1	1.1
1984	71 696.80	12.8	37.3	12.9	16.1	5.3	14.8	0.9
Tunisia								
1978	216 185.32	11.2	33.5	10.9	24.2	10.2	8.8	1.2
1979	284 851.26	12.5	33.8	17.6	19.1	8.5	8.4	0.2
1980	352 701.96	11.7	36.3	20.5	15.3	8.3	7.7	0.2
1981	377 885.53	11.3	33.6	20.3	18.4	9.2	6.9	0.2
1982	341 273.66	8.6	37.9	12.7	21.6	11.7	7.1	0.4
1983	311 667.67	13.2	37.3	11.6	20.5	8.8	7.5	1.0
1984	317 080.82	12.6	37.9	10.9	20.9	10.3	6.9	0.4
Turkey								
1978	459 901.16	1.1	34.0	32.0	22.9	8.9	1.0	0.0
1979	535 336.20	1.7	33.4	35.5	22.2	6.4	0.8	0.0
1980	753 780.20	3.3	29.1	48.3	15.0	3.7	0.6	0.0
1981	893 200.32	2.6	29.0	44.1	18.3	5.5	0.5	0.0
1982	892 346.11	2.4	26.0	43.7	19.5	7.8	0.7	0.0
1983	934 851.66	1.6	32.6	43.7	15.0	6.3	0.8	0.0
1984	1 082 159.40	4.8	32.7	35.4	19.9	5.8	1.3	0.0

Source: United Nations [36].

IV. The outlook for 28 branches of manufacturing industry

A. Introduction

Manufacturing has been divided into 28 industrial branches in the International Standard Industrial Classification (ISIC) of all economic activities. The aim of this chapter is to consider the present situation, the future prospects and UNIDO activities in each of these 28 industrial branches.

Under "the present situation", the past trends of demand and output in different regions and countries, the changing structure in terms of major product groups and the contributions of different regions to the recent changes are reviewed briefly.*

Under "future prospects", UNIDO short-term forecasts of the level of output in 1987 and 1988 are presented for the South and the North and for each of the six regions of the South. This set of forecasts is based on trends in industrial output observed in 82 countries, individually, which include 40 developing countries producing some 90 per cent or more of industrial output in the South. Independent assessments of the long-term prospects for specific products are also presented where available.

Technological innovation has a major impact on long-term prospects for an industry wherever it is located. Hence this section also presents features of recent major technological development as regards new products, improvements in manufacturing processes, automation, use of computers and CAD/CAM systems, as well as energy saving and waste recycling.

Under the heading of "UNIDO activities", an overview is given of major UNIDO technical co-operation projects related to specific industries, including training activities, and new industrial projects promoted by the UNIDO Investment Promotion Service, as well as some of the studies and Consultations relevant to each industry. The aim here is to illustrate how trends in the industry and the pattern of UNIDO activities interrelate.

*The developing countries' share of world output in each branch of industry is measured in terms of value added and not in terms of gross value of production. Such data are available at the ISIC three-digit level for a sample of only 82 countries, including 40 developing countries. For the rest of the world (83 countries) the national account statistics provide only more aggregate data on the manufacturing sector. It should be noted that although estimates are given, by industrial branch, of the South's share of world output in 1970 and 1985 for 165 countries, as well as for the 82-country sample, such estimates for the larger group are considered less reliable than those for the smaller one.

B. Forecasts and analysis of data

*1. Food products (ISIC 311, 312)**

Slaughtering, preparing, preserving meat
Dairy products
Canning, preserving fruits and vegetables
Canning, preserving, processing fish
Vegetable and animal oils, fats
Grain mill products
Bakery products
Sugar factories, refineries
Cocoa, chocolate, sugar confectionery
Other food products
Animal feed

(a) *Present situation*

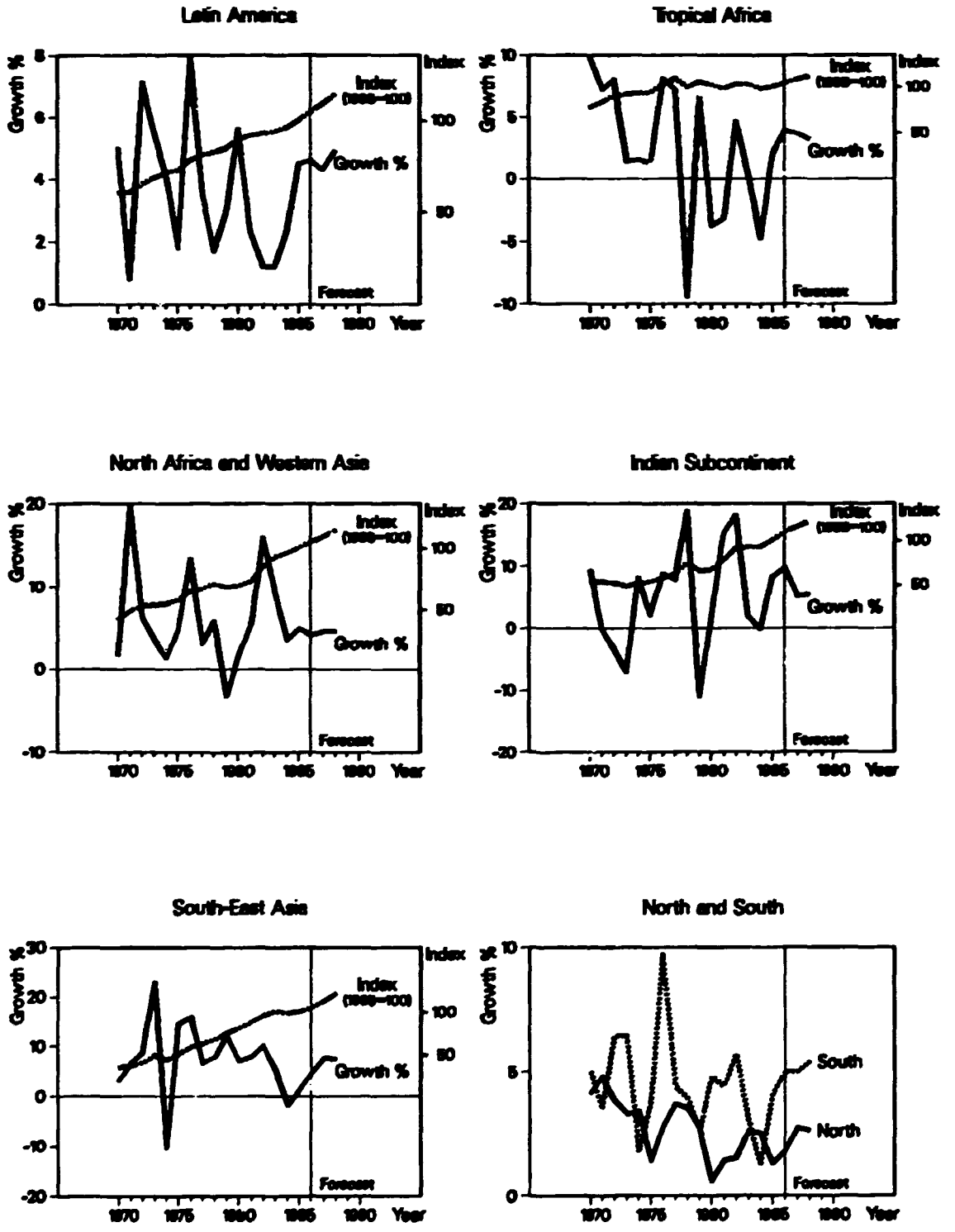
Food processing is the largest single manufacturing industry, accounting for 10 per cent of total manufacturing output in developed countries and 15.9 per cent in developing countries in 1985. Processed food is most widely used in Latin America, where it contributed 20 per cent of total manufacturing output in 1985. In the same year, the contribution of the industry was 14.3 per cent in Tropical Africa, 12 per cent on the Indian Subcontinent, 18.3 per cent in North Africa, 13.5 per cent in Western Asia, and lowest at 11.6 per cent in South-East Asia. Figure XIX shows regional trends in growth of MVA in the food products industry since 1970 and forecasts to 1988.

Output of processed food has grown faster in the South (4.4 per cent per annum from 1970 to 1985) than in the North (2.6 per cent). As a result, the South's share of world output in this branch rose from 14.1 per cent in 1970 to 17.5 per cent in 1985 on the basis of a sample of 82 countries, or from 16 per cent to 19.3 per cent on the basis of data from 165 countries.

The performance of the industry has varied from region to region in the 1980s. In Latin America, output increased 12 per cent between 1980 and 1985 despite the recession, but there was a decline in output in Tropical Africa. In this period output grew 64 per cent

*UNIDO acknowledges a contribution on this industry from Hugh Darrington, Editor of *Food Manufacture* (London).

Figure XIX. Food products (ISIC 311, 312)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SPR/GLO.

in Western Asia, 50 per cent in the Indian Subcontinent, 25 per cent in East and South-East Asia and 20 per cent in North Africa.

The share of world output of different types of food produced by developing countries, centrally planned Europe and developed market economies in 1974 and 1984 is shown in table 45. The food products subject to industrial processing in developing countries reflect the pattern of diets. The main cereal crop, rice, is not subject to industrial processing. Developing countries also consume a large volume of root crops such as cassava and pulses without processing. Developing countries consume less dairy products and meat than developed countries, but there are substantial industries processing fish, sugar and vegetable oils and fats.

Output of meat has been growing steadily in developing countries (about 4.4 per cent per annum from 1974 to 1984) and is expected to continue to do so. Some countries still rely heavily on imports of meat. Only a small proportion of meat output is processed for export because developed countries produce a large surplus.* Canned beef is now a less important source of export revenues for Argentina and Uruguay than it was in the past.

Dairy products constitute a very small part of the food-processing industry in developing countries. Some developing countries rely extensively on imports, which draw from the over-production of dairy products in some developed countries with temperate climates.** The development of this branch should receive greater attention in the future and its output could grow faster than the 2.5 per cent per annum achieved between 1974 and 1984 in developing countries.

Fresh fruits and vegetables are preferred in developing countries. Canned fruit is produced mainly for export. In developed countries the output of canned fruits and vegetables has declined over the last 10 years, reflecting a greater consumer preference for frozen fruit and vegetables. Between 1974 and 1984, the output in developing countries increased slowly at about 1.7 per cent.

The processing of fish is a more important industry in developing countries where fish is a major source of protein. Production of tinned, frozen and salted fish in the group of developed countries reporting output to the United Nations grew faster between 1974 and 1984 than output in a similar group of developing countries. The latter countries produce mainly salted or dried fish, whereas in developed countries frozen fish is dominant.

World fish production reached 82.7 million tonnes in 1984, an increase of 7.7 per cent over 1983 compared with the annual 2 per cent growth of the 1970s and 7 per cent annual growth rates achieved in the 1950s and 1960s. About 90 per cent of the fish catch is from the sea and 10 per cent from fresh water inland lakes and rivers. More than 75 per cent of the world's fish is taken by 18 leading fishing nations, with the USSR and Japan together accounting for 27 per cent. Other leaders are China, Peru, the United States, Norway and India in that order. Developing countries account for 23 per cent of the world fish catch. Among those countries, fishing flourishes in Asia and Latin America, but in Africa it has declined over the last 10 to 15 years.

Demand for vegetable oils and fats grew 5.3 per cent per annum between 1974 and 1984 in developing countries. Those countries produce about half of the world's output of crude vegetable oils, but less than a third of the world output of refined vegetable oils. Developing countries are the major exporters of palm oil and soya beans for processing in developed countries.

In developed countries, the grain mill and bakery products industry is mature and grew at 0.2 per cent per annum between 1974 and 1984. Cereals are the largest single group of food products consumed in developing countries. Although rice remains the largest crop, output of wheat and maize have grown faster, 5 and 4 per cent per annum, respectively. Nevertheless, cereals account for half of developing countries' imports

*The EEC stock of beef stored in "intervention" stocks at the end of 1986 was 12.5 million tonnes.

**The EEC "intervention" stocks at the end of 1986 were 1.5 million tonnes of butter and 1 million tonnes of skimmed milk powder.

Table 45. Volume of output of the food products industry in various broad economic groupings, 1974 and 1984

(Millions of tonnes)

Product	Developing countries[a]		Centrally planned Europe		Developed market economies	
	1974	1984	1974	1984	1974	1984
Meat and meat products	31.56	48.36	26.35	29.99	65.94	82.37
Dairy products	3.68	4.71	5.87	7.59	16.82	20.92
Fruits and vegetables	1.93	1.91	4.97	5.65	19.13	24.94
Processed fish	3.62	4.94	4.28	5.60	6.29	8.96
Vegetable oils and fats	15.05	25.17	5.48	6.41	29.99	37.43
Grain mill and bakery products	37.70	53.23	100.21	105.66	83.29	84.65
Sugar and refined sugar	55.81	73.40	25.77	31.19	45.22	52.59
Cocoa, chocolate, sugar confectionery	0.66	1.10	2.77	3.33	6.29	7.89
Prepared animal feeds	17.14	29.41	12.39	13.77	119.36	175.57
Total	167.15	246.73	188.09	203.70	392.33	496.55

Source. UNIDO—based on selected groups of food products whose physical volume of output is reported in United Nations [61] and [62].

[a]Including centrally planned Asia.

of food and increased dependence on imports from the North is forecast over the next 15 years [63]. Further increases in the milling capacity for imported wheat and maize will be required in developing countries, and the growth of output in the near future is likely to match the rate of 4 per cent achieved from 1974 to 1984.

Developing countries produce one third of the world's output of sugar. Considerably more cane-sugar could be produced and exported if developed countries did not subsidize their production of sugar beet. The resulting global surplus of sugar depressed prices in 1985 and 1986, but prices increased strongly in the first quarter of 1987. Demand for sugar in developing countries has grown at almost the same pace as the food processing industry as a whole, namely 3 per cent per annum between 1974 and 1984.

The output of cocoa, chocolate and sugar confectionery has grown rapidly in developing countries, by 5.2 per cent per annum between 1974 and 1984. Although the value added is high in this branch, its contribution in terms of weight to total food processing output is very small. Developing countries are the source of world supplies of cocoa. Processing takes place mainly in developed countries, which account for more than 90 per cent of world output of cocoa products.

For other food products including roasted coffee and processed tea leaves, demand has grown slowly in developed countries. Developing countries are the main source of world supplies of coffee beans. Exports of instant coffee and blends of tea have been developed, but processing for the home markets is the main part of output. Developing countries currently consume over 50 per cent of world tea output compared with 21 per cent in 1984, and their demand will continue to expand more rapidly than in developed countries where demand is static.

Prepared animal feeds are one of the largest groups of products of this industry measured in terms of volume. Animal feeds are used mainly to increase a country's output of meat, including poultry. Annual growth of output averaged 5.5 per cent in a sample of developing countries between 1974 and 1984 and 2.3 per cent in a sample of developed countries. Further growth is forecast in developing countries, where demand for meat continues to grow steadily.

(b) *Future prospects*

The food-processing industry in developing countries will need to continue growing at a rate of between 4 per cent and 5 per cent per annum if it is to help feed the fast-growing urban population which in the period 1973-1984 increased by 4.6 per cent per annum in low-income economies, 4.2 per cent per annum in lower middle-income economies and 4.1 per cent per annum in upper middle-income economies [64].

The output of the food-processing industry in developing countries is expected to increase by 5.1 per cent in 1987 and 5.4 per cent in 1988. In developed countries, output is expected to increase by 2.8 per cent in both years.

Among developing regions, the food-processing industry is expected to grow fastest in East and South-East Asia (7.8 per cent in both 1987 and 1988). For the Indian Subcontinent output is forecast to increase by 5.1 per cent in 1987 and 5.4 per cent in 1988. Sustained growth of output at 4.3 per cent in 1987 and 4.9 per cent in 1988 is forecast for Latin America. Output growth is expected to be rapid in North Africa and Western Asia (5.8 per cent in 1987 and 5.1 per cent in 1988). A substantial recovery is forecast for this industry in Tropical Africa, with output up 3.8 per cent in 1987 and 3.3 per cent in 1988 because increased food production has become the top policy objective in most African countries.

The food-processing industry can assist developing countries in implementing food security systems. The scheme of the Andean Group aims at protecting its member States* against risks of food shortages and enabling them to satisfy the food and nutritional needs of their population.** About 47 per cent of the total population were considered as the target population. In this context, food supplement programmes for school children can be supported by the food-processing industry. In 1983, 2.5 million children in Colombia, Peru and Venezuela benefited from such a programme [65]. The foods must be relatively low-cost products; there is no need for the high level of expenditure in marketing and advertising widely found in the more commercial side of this industry.

Technological innovation is changing the shape of the food-processing industry in four main areas, namely biotechnology, process design, automation, and packaging. The UNIDO-sponsored International Centre for Genetic Engineering and Biotechnology, located at Trieste and New Delhi, has been established to help developing countries to apply technological developments in these fields to practical areas such as agriculture and food-processing. It is hoped that plants that provide the industry with low-cost raw materials with ideal specifications for nutrition, quality and ease of food-processing will be established.

In developed countries, most enterprises in the food-processing industry allocate between 0.5 and 1 per cent of sales turnover to research and development. The main goal is new product development; the second goal is improvements in the manufacturing process and packaging; the third goal is technical service [66]. In recent years, CAD/CAM systems—computer-aided process design and systems to control food manufacturing—have been introduced in plants processing vegetable oils, sugar and grains, but they are less suitable for non-continuous processes. Other improvements relate to the ingredients, processing systems, process equipment and packaging [67].

In developing countries, the prime concern is storage of food to avoid spoilage. While irradiation is not yet universally accepted and widely used, the Netherlands has opened a pioneering Gammaster food irradiation plant. The system exposes food products to cobalt-60 and can substantially improve its shelf-life. It is particularly suitable for delaying the ripening of fruit and vegetables and killing salmonella in poultry. Dairy products have a high fat content which produces "off" flavours after radiation. Irradiation can be used to prevent some of the losses in cereal grains

*Bolivia, Colombia, Ecuador, Peru and Venezuela.

**Decision 182 of the Board of the Cartagena Agreement, July 1983.

during shipment to, and storage and distribution in, developing countries. In Bangladesh, Brazil and Chile, irradiation is used to preserve and decontaminate foods such as chicken, fish, rice and pulses. It is also used to control the ripening of fruit including mangoes and papaya, which are important exports.

Other improved techniques of food preservation include: aseptic processing and packaging; retortable pouch packaging, a technique used widely in Japan; and modified atmosphere packaging, a system in which products are packaged in a controlled atmosphere containing high quantities of carbon dioxide or nitrogen to slow down bacterial growth. The use of biotechnology to aid established processes such as brewing (with enzymes) and speeding up cheese maturation have been or are being developed. A "synthetic protein" grown in a tank can be processed to stimulate a fibre. Whey protein, a by-product of cheese manufacture, is also being used. A technique of cooking cereals and then extruding them under pressure through a die has been developed which produces snack foods, crispbreads and breakfast cereals at considerably less cost than dedicated lines. It offers great versatility in that the machine can be easily switched between products.

In packaging, 1986 saw a wider introduction of cans made of polyethylene terephthalate (PET). Makers claim that they can be cheaper than aluminium cans and that they are suitable for hot filling and pasteurization operations. PET containers have also been developed in large sizes. To extend shelf-life beyond 9-12 months, a coating of polyvinylidene chloride is applied to the exterior [68].

Developing countries adapt food technology to produce food products tailored to the traditional tastes of their consumers. They absorb ideas from other countries but not their preferences. This can be a two-way process; in developed countries, increased emphasis on good nutrition has led to growing popularity of foods like "tofu" (soy protein curd) already widely consumed in some Asian developing countries and China [69].

(c) *UNIDO activities*

The food products industry received 5.7 per cent of the total volume of UNIDO industry-specific technical co-operation between 1980 and 1986 worth $20 million. Some of the food-processing industry projects implemented in 1986 are listed in table 46.

Many UNIDO technical co-operation projects aim at strengthening the essential links between industrialization and agricultural development. UNIDO has supported an integrated approach to the promotion and development of agro-industries in countries like

Table 46. Selected UNIDO technical co-operation projects related to the food products industry

Region, country or area	*Source of funds*[a]	*Executing period*[b]	*Project title*[c]
Africa	RP	1985—	Industrial training and consultancy services in the field of cane-sugar industry for Africa
Angola	UNDP	1985—	Rehabilitation of slaughter-houses
	UNDP	1986—	Techno-economic prefeasibility study—conversion of sugar
Argentina	COFN**	1981—	Contribución a la generación de tecnologia en el área de alimentos del Instituto Nacional de Tecnologia Industrial
Bangladesh	UNDP*	1985—	Rice bran oil extraction plant
Barbados	IDF	1986—	Techno-economic feasibility study on fish processing
Bolivia	UNDP*	1983—	Establishment of viticulture centre
	UNDP/ IDF**	1983—	Establishment of a training centre for meat/milk products processing
	COFN*	1984—	Agricultural diversification and agro-industrial development
Brazil	UNDP*	1982—	Creation of a national food packaging centre
Burma	UNDP	1985—	Laboratory examination of spirulina samples
China	UNDP*	1982—	National Cane Sugar Industry Research Centre
	UNDP	1985—	Assistance to the Beijing Food Additives Development Centre
Cook Islands	UNDP	1986—	Pineapple production
Cuba	UNDP	1974—	Development Centre for Industrial Fermentation and Nutrition
	UNDP*	1981—	Asistencia al Centro Nacional de Envases y Embalajes
	UNDP	1985—	Improvement of nutritive value and conservation of harvest residues by means of ensilage
Democratic Yemen	UNDP	1985—	Improvement of bread production and distribution
Ecuador	UNDP	1984—	Improvement of technology in production of animal feedstuff and its quality control
Egypt	UNDP*	1981—	Sugar-cane training and development centre
	UNDP*	1986—	Strengthening food development centre
El Salvador	UNDP**	1982	Integrated agro-industrial development
Ethiopia	UNDP	1985—	Assistance to the establishment of the national utilization scheme for slaughter-house by-products
	RP	1986—	Strengthening the intersectoral linkage between agriculture and industry
	RP	1986—	Feasibility study of a baby food manufacturing complex

Table 46 (continued)

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Guinea	UNDP*	1982—	Assistance à la préparation d'un programme pour la réhabilitation, la modernisation et l'expansion de l'agro-industrie
Guinea-Bissau	IDF	1985—	Etude d'opportunité d'une minoterie en Guinée-Bissau
India	IDF	1986—	Techno-economic study for the establishment of a potato-processing pilot industry
	IDF	1986—	Preparation of the technical details and cost estimates for a potato-processing pilot factory
Jamaica	UNDP	1986—	High-level advisory mission on agro-processing
Mali	UNDP*	1981—	Assistance à la Société des conserves alimentaires du Mali
	UNDP	1985—	Evaluation d'une étude de factibilité du projet du complexe sucrier de Bankoumana
Malta	UNDP*	1983—	Technical assistance for Grand Harbour Grain Terminal
Mexico	UNDP*	1982—	Riesgo compartido, productividad y cambio tecnológico en la cadena alimentaria
	UNDP	1985—	Integrated agro-industry development
	UNDP	1985—	Promoción y desarrollo de la agro-industria integrada
Mongolia	UNDP*	1982—	Assistance to Ulan Bator Central Milk Products Factory in the production of baby food
	UNDP	1985—	Assistance in modernization of meat storage through freeze-drying technology
	UNDP	1985—	Assistance to the dairy industry through improvement of raw milk testing and quality control
Morocco	UNDP*	1980-1986	Assistance à l'usine de traitement et de conditionnement des dattes et de production d'aliments pour bétail
Mozambique	IDF	1983-1986	Rehabilitation, modernization and expansion of small and medium-scale plants
	IDF*	1980—	Rehabilitation and developmet of the bakery industry
	UNDP	1985—	Rehabilitation and development of the bakery industry
Niger	RP	1985-1986	Development of agro-industry for essential industrialization
Panama	IDF	1986—	Prefeasibility study for the establishment of an integrated coconut-processing complex
Peru	COFN**	1984—	Financial assistance to the cocoa-processing plant
	COFN*	1986—	Development of cocoa production and processing
Sierra Leone	UNDP	1983—	Assistance for establishing and managing a Gari-making pilot plant
	UNDP	1985—	Demonstration for the rehabilitation of seven palm-oil (pioneer) mills
Solomon Islands	UNDP	1985—	Assistance to food-processing industry
Sri Lanka	UNDP	1984-1986	Agro-industry development in Mahaweli System "H"
Trinidad and Tobago	OTF	1984—	Prefeasibility study on hydrogenation of shark fillet
Uganda	UNDP*	1981—	Rehabilitation of Mukisa Foods Limited
United Republic of Tanzania	RP	1986—	Preparatory assistance in the field of food testing and quality control in food-processing industry
Uruguay	UNDP	1985—	Identification of alternative meat products for export
Vanuatu	UNDP	1986—	Assistance in the development of the food-processing industry
Viet Nam	UNDP*	1980	Production of baker's yeast
Yemen	IDF	1979—	Establishment of food testing and quality control laboratory
Zaire	UNDP*	1981—	Valorisation des produits agricoles nationaux
Global	IDF*	1977—	Development of a castor-bean detoxification technology and the setting-up of a demonstration plant in a selected developing country
	IDF	1981—	Development of an industrial rubberseed processing technology for the production of vegetable oil and animal feed
	IDF	1983—	Demonstration and evaluation of a small-scale expeller unit for the production of coconut oil from copra
Interregional	IDF	1982—	Pepper processing expert to be attached to the secretariat of the Integrated Programme for Commodities

[a]COFN = Cofinancing with other agencies; IDF = Industrial Development Fund; OTF = Other Trust Funds; RP = Regular Programme; UNDP = United Nations Development Programme; UNDPTF = UNDP-administered Trust Funds. Asterisks indicate large-scale projects. A single one means a total allotment, or expenditure in the case of projects completed by 1986, of $150,000 or above. Two mean a total allotment, or expenditure in the case of projects completed by 1986, of $1 million or above.

[b]A year followed by a dash (e.g. 1985—) indicates an on-going project.

[c]Working titles taken from project files.

Bolivia, El Salvador, Mexico, Niger, the Solomon Islands, Sri Lanka, Vanuatu and Zaire.

In some countries, the top priority is to rehabilitate existing industries. Guinea, a country which is currently making a radical shift in industrialization strategy, has been helped to prepare a programme for the rehabilitation, modernization and expansion of agro-industries. Sierra Leone has been assisted in the rehabilitation of seven palm oil mills. In Angola, UNIDO advised on the conversion of a sugar industry into an agro-industrial complex. Uganda has been assisted in rehabilitating a food-processing factory.

In Senegal the Institut de technologie alimentaire, supported by UNIDO, has been the guiding force in diversifying and restructuring the food-processing industry. In collaboration with the Société nationale d'études et de promotion industrielle, investments in plants producing fruit juice, dehydrated fruit and vegetables, fruit meal and other fisheries projects have been promoted.

In other low-income countries, there is an urgent need to strengthen local capabilities in food technology. UNIDO has helped to strengthen laboratories for food testing and control in Afghanistan and the United Republic of Tanzania. Food technology is also an important area of international co-operation in middle-income countries. A food technology component has been added to the functions of the National Institute of Industrial Technology in Argentina. In Egypt, UNIDO has helped to strengthen the food development centre.

Other UNIDO projects focus on specific branches of this industry. In China, where output of sugar has grown more rapidly than in other countries in recent years, UNIDO has assisted the Government in modernizing the sugar refining industry through assistance to the Cane Sugar Industry Research Centre. In Egypt, UNIDO has supported the sugar training and development Centre. The meat-processing industry has been assisted in Angola, Ethiopia and Mongolia. Improved processing of fruits and vegetables have been the objective of projects in the Cook Islands, India, Morocco, Niger and the Seychelles. In Peru, UNIDO has supplied financial as well as technical support for a cocoa-processing plant.

UNIDO has used finance from the Industrial Development Fund to pioneer the development of technologies suitable for processing raw materials in developing countries. Projects whose findings can be applied in many countries involve: extraction of edible oil from rice bran; detoxification of the castor bean; extraction of oil from rubber seeds; use of small-scale expeller units for the production of coconut oil from copra; and processing of pepper.

Packaging is an important element of the food-processing industry where modern methods can be introduced. For example, UNIDO has supported a national food packaging centre at the Institute of Food Technology in Brazil. Regional packaging centres are envisaged in the Arab countries and Latin America. Requests for similar assistance have also been received from countries such as Cuba, Guinea Bissau, Jamaica, Nicaragua, Turkey and Viet Nam.

World-wide Consultations on the Food Processing Industry were convened by UNIDO in 1981 and 1984. They stressed the need for integrated development of raw food production, food processing and marketing and the important role of small and medium-scale enterprises. The development of the vegetable oils and fats industry was discussed at two UNIDO Consultations in 1977 and 1984. The First Consultation on the Fisheries Industry was held in Gdansk in June 1987. The discussion of fish processing as an industry is a natural sequel to the World Conference on Fisheries Management and Development held by the Food and Agriculture Organization of the United Nations (FAO) in Rome in July 1984.

Investment in the food-processing industry is a focus of UNIDO Investment Promotion meetings at the country level. A total of 22 projects covering a range of different branches of this industry were promoted in 1985 and 1986 (see Table 47).

Table 47. Projects in the food-processing industry in which investment was promoted by UNIDO in 1985 and 1986

Country	*Product or process involved*	*Total investment in plant (millions of dollars)*
Antigua and Barbuda	Grape juice	0.5
Bahamas	Citrus fruit—integrated production	50.0
China	Bread	...
	Cold storage	3.0
Costa Rica	Processed eel	3.6
Egypt	Milk	2.5
Ghana	Baby food	2.0
	Cold storage	2.0
Guinea	Canned tomatoes	6.2
Indonesia	Liquid-frozen eggs	6.2
Kenya	Cold storage for vegetable exports	1.4
Madagascar	Milled rice	1.0
Malawi	Animal feed	0.7
	Milled maize	1.2
	Processed limes	...
	Starch	0.4
	Vegetable oil solvent extraction	6.8
Niger	Milled sorghum millet	2.6
Nigeria	Dried cassava	3.2
Peru	Sausages	1.4
Sri Lanka	Spray-dried coconut milk	...
United Republic of Tanzania	Milled grain and bakery products	2.6

Source: UNIDO Investment Promotion Service.

2. *Beverages (ISIC 313)**

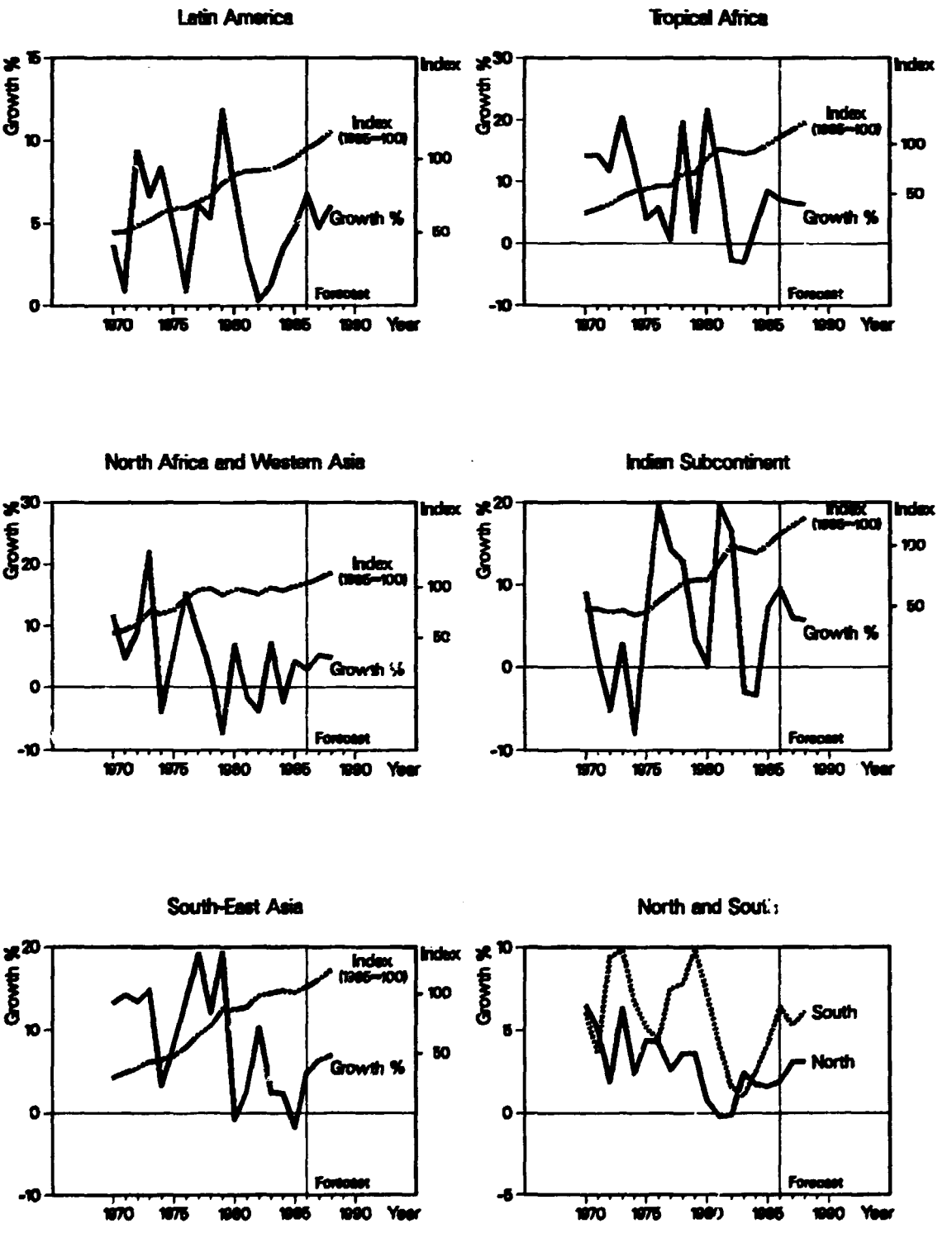
Distilling of alcoholic spirits
Wine
Beer and other malt liquors
Soft drinks

(a) *Present situation*

The beverage industry accounts for 2.1 per cent of total manufacturing output in developed countries and 3.4 per cent in developing countries. Beverages

*UNIDO acknowledges information on this industry provided by Pepsi-Cola International, Vienna, Austria.

Figure XX. Beverages (ISIC 313)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO

account for an unusually large part of manufacturing output in Tropical Africa, 14.4 per cent in 1985. In other developing regions the contribution is lower, namely, 4.6 per cent in Latin America, 1.9 per cent in South-East Asia, 1.9 per cent in North Africa, 1.2 per cent in Western Asia and 1.1 per cent in the Indian Subcontinent (see figure XX for regional trends).

Between 1970 and 1985, output of this industry increased twice as fast in the South as in the North (5.6 per cent versus 2.7 per cent per annum). As a result, the South's share of world output rose from 11.9 per cent in 1970 to 17.1 per cent in 1985, and should reach 18.4 per cent by 1988, on the basis of a sample of 82 countries, or from 13.5 to 18.9 per cent on the basis of data from 165 countries.

The composition of the output of the industry varies from region to region according to consumer preference (see table 48). On a per capita basis, Western Europeans drink five times as much wine and twice as much bottled mineral water as Americans; Americans drink almost four times as many carbonated drinks as Western Europeans, including eight times as much cola.

Carbonated soft drinks account for about half of the volume of the beverage industry's output in the United States and a high proportion in developing countries. A small group of transnational corporations have vigorously promoted the industry's development by establishing internationally their own brand names such as Coca Cola, Fanta, Sprite, Pepsi Cola, Seven Up, Schweppes and Canada Dry. They supply the soft drink bases, syrups and concentrates to domestic soft-drink companies that handle bottling and distribution under franchise arrangements. The structure of the carbonated soft-drinks industry has become more concentrated in recent years. Large suppliers have purchased additional brands. Small suppliers have merged or combined to combat the strength of the large suppliers.

In the United States, colas account for 65 per cent of carbonated soft-drink sales ([70], pp. 37-40); in Western Europe their share is 35 per cent, up from 26 per cent a decade ago [71]. Colas have a smaller share of the carbonated soft-drinks market in most other regions. They have been strongly promoted in Latin America, but do not have such a large market share in Asia and Africa. For example, in India the carbonated soft-drinks market has so far been supplied by three large indigenous companies and many small bottlers; these companies will soon be joined by Pepsi Cola, which has agreed that the concentrates will be manufactured locally in India rather than supplied from abroad [72].

One of the fastest-growing markets for carbonated soft drinks is China, where output rose from 288,000 tonnes in 1980 to 1 million tonnes in 1985. It is expected to reach 3 million tonnes in 1990 and 10 million tonnes in 2000. China is also planning to increase varieties with extracts of tonics such as ginseng, white fungus, velvet, chivetta and fruits.

The carbonated soft-drinks industry is a large consumer of sugar. In the United States, the industry switched to high-fructose corn syrup when price support legislation in 1981 made cane- and beet-sugar too expensive. The increased use of artificial sweeteners has also reduced demand for sugar and hence the level of sugar imports from developing countries. The value of sugar exports of countries covered by the Caribbean Basin Initiative fell from $686 million in 1981 to $250 million in 1984 [73].

Beer consumption on a per capita basis has declined in the United States and Western Europe over the last 10 years and since 1982 in Eastern Europe. Beer consumption in developing countries, however, is rapidly growing. For the group of countries reporting output to the United Nations, beer output increased between 1974 and 1984 by 33 per cent in Tropical and North Africa, by 68 per cent in Latin America and by 35 per cent in Asia excluding China. The fastest growth in beer output has been in China, the annual growth rate being almost 30 per cent over the last decade. China plans to increase beer output by 70 per cent by 1990.

Over the last 10 years, the trend in Western Europe has been to drink less wine. In the United States, however, demand for wine has been rapidly increasing at an annual growth rate of 6 per cent. All developing regions reduced wine production in the period con-

Table 48. Production of beverages, 1974 and 1984

(Millions of hectolitres)

	Soft drinks		*Beer*		*Wine*		*Spirits*		*Mineral water*	
Country or grouping	*1974*	*1984*	*1974*	*1984*	*1974*	*1984*	*1974*	*1984*	*1974*	*1984*
Developing countries	81.3	237.0	99.8	181.5	46.4	33.8	17.7	24.3	6.1	14.7
Africa	6.8	17.5	24.3	32.2	8.8	3.0	0.3	0.3	1.3	3.3
Asia[a]	14.7	51.9	11.7	22.4	1.6	1.5	4.7	9.9	0.1	0.6
Latin America	59.8	143.0	62.1	104.6	36.0	29.0	12.6	14.2	4.7	10.8
Centrally planned Europe	52.4	63.1	125.1	147.8[b]	43.6	57.5[b]	5.3[c]	7.2[c]	30.9	24.2
Western Europe	131.4	173.3	271.4	283.5	223.8	213.3	19.0	18.8	70.2	113.6
United States	...	515.1[d]	179.5	229.0	14.2	26.5	11.1	14.4	...	47.1[d]
Japan	29.4	28.8	36.4	46.0	0.2	0.3	4.2	9.5	...	0.9

Source: United Nations [61] and [62].

[a] Excluding China.

[b] 1983 data for the USSR.

[c] USSR data not available.

[d] Consumption figure provided by Canadian Limited, European Soft Drinks Service.

cerned. Throughout the world wine production has remained constant except in Japan and the United States, where wine is a relatively new drink or where a number of combinations of wine and fruit juices are being introduced in the market.

Because of increased government taxes on spirits in many countries, the level of world sales of spirits has stagnated in recent years. Consumption is still growing in some developing countries, where it has been supplied by increased imports as well as increased local production.

There has been a revival of interest in the consumption and production of mineral waters. Demand has increased steadily over the last 10 years in Western Europe, the United States and developing countries.

(b) *Future prospects*

The output of the beverage industry in developing countries is expected to increase by 5.3 per cent in 1987 and 6.1 per cent in 1988. In developed countries, output is expected to grow by 3.3 per cent in 1987 and by 3.2 per cent in 1988.

Output in developing countries is expected to grow fastest in East and South-East Asia (6.4 per cent in 1987 and 6.9 per cent in 1988). In the Indian Subcontinent, where capacity for bottling soft drinks is being expanded, forecast growth is 5.8 per cent in 1987 and 5.5 per cent in 1988. Steady growth in output is expected in Latin America (4.7 per cent in 1987 and 6 per cent in 1988), where the infrastructure of bottling capacity is in place in most countries and also in Western Asia (6.9 per cent in 1987 and 6.1 per cent in 1988). Demand is expected to recover in North Africa and output to grow by 2.4 per cent in 1987 and 2.7 per cent in 1988. This industry will continue to be one of the fast-growing industries in Tropical Africa, with forecast increases in output of 6.6 per cent in 1987 and 6.3 per cent in 1988.

The prospects are that the output of this industry in developing countries will continue to grow faster than most other branches of industry. The market for carbonated soft drinks in developed countries is saturated and demand is expected to grow slowly at rates of 2 per cent per annum in the United States and 3 per cent per annum in Western Europe. But in developing countries, population is growing 2 percentage points faster and demand for soft drinks is expected to increase by between 5 and 10 per cent per annum, depending on the rate at which incomes advance and the stage reached by the industry in building sufficient bottling capacity to achieve national distribution of its products.*

The market for beer is also expected to grow rapidly. Demand for wine and spirits in developing countries is expected to grow more slowly, since these beverages are purchased by only a small proportion of the population and are subject to heavy taxes and duties in most countries.

There have been major changes in the type of containers used for packaging soft drinks. Considerable quantities of beer and soft drinks are now sold in aluminium cans. Large plastic bottles (2 litre) made from PET are now used in growing volume, but at present there is no technology to ensure positive carbonation retention in small-size plastic bottles. Glass bottles have lost 50 per cent of the market in the United States and about 14 per cent in Europe. In some developing countries, bottled water for drinking is packaged in large polyethylene containers (10 litre) rather than glass bottles. In most developing countries, glass bottles continue to account for a high proportion of the containers used to bottle beer and soft drinks.

In future, new investments are likely to be made in developed countries in high-speed automated bottling plants, new forms of packaging—metal and PET cans as well as 2-litre PET bottles—and new forms of sealing bottles (reusable plastic or metal screw tops rather than crown corks). Some of these developments will be adopted by the beverage industry in developing countries. But in countries with very low labour costs, glass containers may continue to be the cheapest form of container.

(c) *UNIDO activities*

The role of UNIDO in this industry may be illustrated by Djibouti's requested assistance from UNIDO in rehabilitating a bottling plant for a local mineral water. The new Special Programmes and Activities Division of UNIDO arranged for a mineral-water producer from Vittel in France to visit the plant to give advice on problems associated with cleaning the glass bottles, sealing the filled ones and avoiding breakage in distribution. Under the same UNIDO programme, China has expressed interest in introducing new forms of packaging for its fast-expanding output of mineral water, soft drinks and beer.

UNIDO promoted investments in four projects in the beverage industry in 1985 and 1986, including a large investment in a brewery in China (see table 49).

Table 49. UNIDO-promoted projects related to the beverages industry, 1985 and 1986

Country	*Product or plant*	*Total investment in plant (millions of dollars)*
Benin	Soft drinks	4.6
China	Brewery	16.0
Rwanda	Mineral water	1.2
Malawi	Crown-cork plant	0.2

Source: UNIDO Investment Promotion Service.

3. *Tobacco products (ISIC 314)*

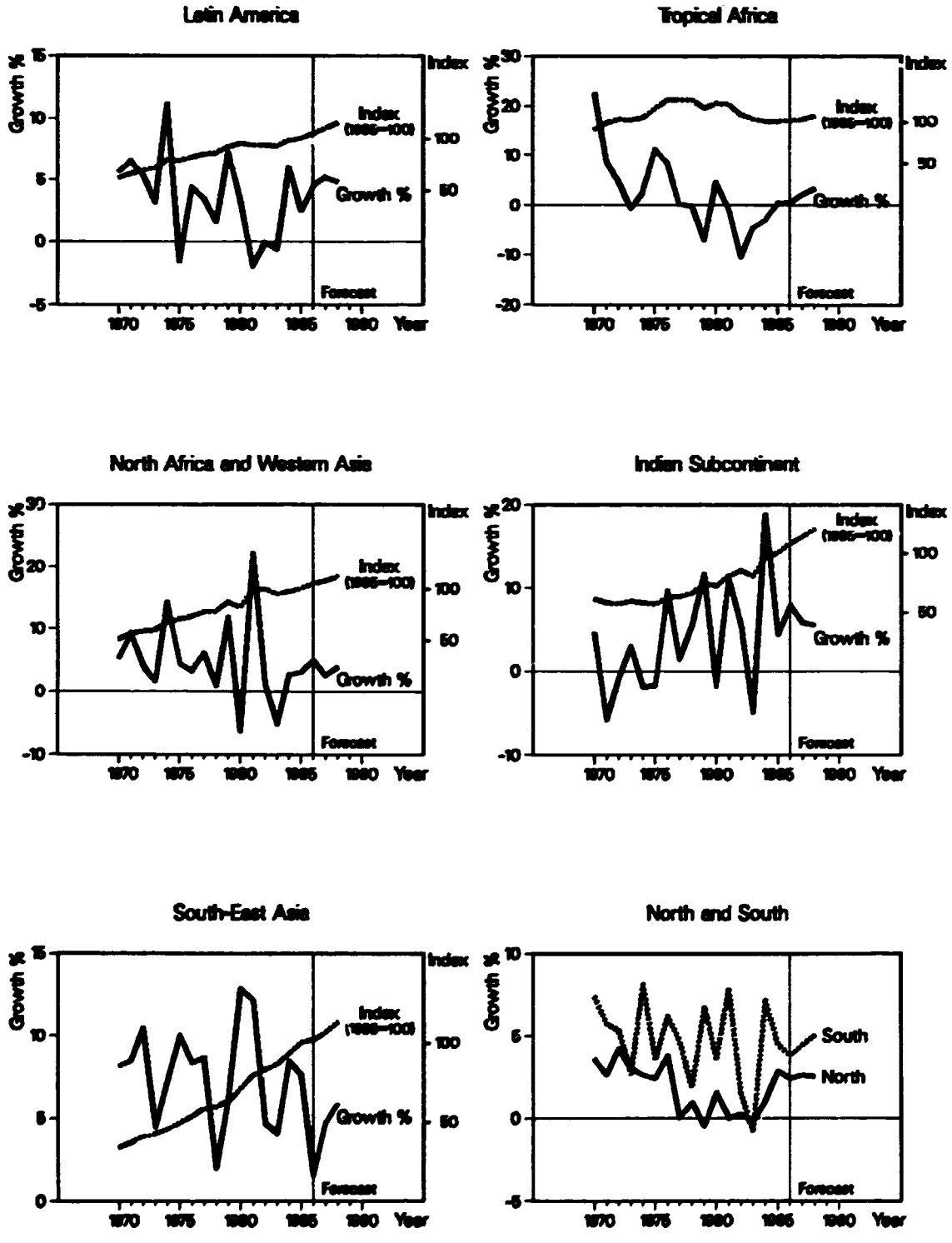
Curing tobacco leaves
Cigarettes, cigars
Smoking tobacco

(a) *Present situation*

Cigarettes account for more than 85 per cent of the output of tobacco products. Other products are cigars,

*"When asked what percentage growth he was targetting for soft-drinks over the next five years, the Chief Executive Officer of Coca-Cola said we want to grow 40 per cent in some places, 7 per cent in others and overall internationally by at least 10 per cent", quoted in *Beverage World International*, October 1986, p. 62.

Figure XXI. Tobacco products (ISIC 314)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

smoking tobacco and chewing tobacco. In most developed countries, cigarette production peaked around 1980 and has since been on the decline because of health warnings.

In 1985, the tobacco products industry contributed 0.6 per cent of total manufacturing output in developed countries in 1985 and 2 per cent in developing countries. By region, its contribution was 4.1 per cent in Tropical Africa and 3.1 per cent in North Africa. It was lower in Western Asia and in East and South-East Asia (2.6 per cent), the Indian Subcontinent (2.5 per cent) and Latin America (1.3 per cent) (see figure XXI for regional trends).

Between 1970 and 1985, the industry grew almost three times as fast in developing countries as in developed countries (4.5 per cent versus 1.6 per cent per annum). As a result, the developing countries' share of world output of tobacco products rose from 22 per cent in 1970 to 30 per cent in 1985 on the basis of a sample of 82 countries, or from 27 to 34.6 per cent on the basis of data from 165 countries.

China is the world's largest market for cigarettes, with sales of 1,000 billion cigarettes in 1986. This was more than the United States (600 billion), the EEC (600 billion), the USSR (400 billion) and Japan (300 billion). China is also probably the world's fastest growing market for cigarettes; even without advertising, consumption increased by 10 per cent between 1983 and 1984.* To meet this growing demand, China has increased average factory size while reducing the number of factories from 344 to 140, and has revitalized and re-equipped the industry.

About 60 developing countries report the physical volume of their cigarette production to the United Nations, their output reaching 1,000 billion cigarettes in 1984 (see table 50). In the period 1980 to 1984, output growth slowed in all regions except Western Asia. Output declined by 1.5 per cent per annum in Latin America in this period.

Table 50. Production of cigarettes in 60 developing countries, 1975-1984

Region	Output in billions of units			Percentage annual growth	
	1975	1980	1984	1975-1980	1980-1984
Latin America	273.8	343.7	318.1	4.7	1.5
Tropical Africa	68.9	79.8	84.2	3.0	1.1
North Africa	49.0	70.0	77.3	7.4	2.0
Western Asia	86.3	87.8	102.5	0.3	3.1
Indian Subcontinent	104.1	135.6	149.2	5.4	1.9
South-East Asia	196.6	261.6	293.3	5.9	2.3
Total	778.7	778.5	1 024.6	4.7	1.0

Source: United Nations [62].

The output of the 10 developing countries with the largest production of cigarettes is shown in table 51. There is a wide variation in performance between 1975 and 1984, ranging from growth at 6.7 per cent per annum in Indonesia to a decline of 2.6 per cent per annum in Argentina.

*According to Rene Scull, Vice-President, Phillip Morris Asia, quoted in *World Tobacco*, September 1986.

Table 51. Developing countries with the largest volume of cigarette production in 1975, 1980 and 1984

Country	Output in billions of units			Percentage annual growth
	1975	1980	1984	1975-1984
Argentina	38.6	34.6	30.8	2.6
Brazil	101.7	151.4	127.8	2.6
India	59.3	77.4	85.2	4.1
Indonesia	54.6	80.2	99.4	6.7
Mexico	46.8	54.6	52.8	1.2
Pakistan	26.8	34.6	40.1	4.5
Philippines	47.7	56.8	58.6	2.3
Republic of Korea	52.5	70.4	78.0	4.4
Thailand	22.6	30.8	29.2	2.6
Turkey	54.6	52.0	62.1	1.5

Source: United Nations [62].

The cigarette industry has steadily increased its reliance on local raw materials in many developing countries. Imported leaf is needed for blending purposes in a number of countries, but other countries are self-reliant. For example, tobacco is grown on nutritionally poor land in Sri Lanka, and oriental tobacco is grown as a second crop on rice land in Thailand.

(b) *Future prospects*

The output of cigarettes and other tobacco products in developing countries is expected to increase by 4.7 per cent in 1987 and 4.2 per cent in 1988. In developed countries, past trends suggest an increase in output of 2.6 per cent in both 1987 and 1988, but warnings of the adverse impact of smoking on health could lead to further decline in output.

There was a sharp recovery in cigarette output in Latin America in 1986 and further growth is forecast at 5.2 per cent in 1987 and at 4.2 per cent in 1988. Output is forecast to grow fast in the Indian Subcontinent (5.7 per cent in 1987 and 5.3 per cent in 1988). Output increases in East and South-East Asia of 5.5 per cent in 1987 and 6.3 per cent in 1988 are forecast. In Tropical Africa, where output fell between 1980 and 1985, increases in output of 2.4 per cent in 1987 and 3.5 per cent in 1988 are forecast. In Western Asia, output is expected to fall by 0.5 per cent in 1987 and increase by 1.2 per cent in 1988.

Cigarette consumption will continue to be restrained by the considerable revenues that Governments raise from the tobacco industry. In India and Pakistan, as much as 70 per cent of the retail price of a packet of cigarettes goes to the Government. Asian Governments, including that of Japan, raised the equivalent of $15 billion in revenues from tobacco in 1985; the 12 member countries of the EEC raised $23 billion in 1982; and the United States raised $5 billion in 1985 ($8 per 1,000 cigarettes).*

The long-term prospect for cigarette output in developing countries is for steady but rather slow growth. Cigarette consumption per capita will be

*For EEC estimates, see Antonio Quatraro, "Tobacco: employing 1.8m people in the EEC", *World Tobacco*, September 1986; United States calculations were based on *United States Industrial Outlook 1986* (Washington, D.C., Department of Commerce, 1986).

stable and increases will reflect the rapid growth of the population of smoking age. Health warnings and the high levels of tax and excise duties are expected to deter any major increase in the incidence of smoking.

The technological trend in developed countries has been to automate the manufacture and packing of cigarettes. The capacity or throughput of machines has reached a very high level and the emphasis has switched to introducing more flexibility. The cigarette factory of the future will represent an integrated, cross-linked, flexible, controllable and complete system able to react automatically and economically to changed market conditions [74].

As this is one of the older industries in most developing countries, there will be a need gradually to re-equip existing plants in the late 1980s and 1990s. This process will be combined with greater flexibility to accommodate the introduction of new brands that reflect consumers' growing preference for blended as opposed to Virginian tobaccos in cigarettes and low-tar and low-nicotine varieties.

(c) *UNIDO activities*

The number of requests for UNIDO technical co-operation has been small. In 1985, the Organization provided assistance to the National Tobacco Enterprise in Peru. In 1986, the UNIDO Investment Promotion Service promoted investment in a cigar factory in Dominica costing $0.9 million.

*4. Textiles (ISIC 321)**

Spinning, weaving, finishing of textiles
Household textile goods
Knitted goods
Carpets and rugs
Cord, rope and twine
Other textile products, including tyre cord

(a) *Present situation*

The textile industry employed 5.3 million workers in developing countries in 1985 or 16 per cent of the industrial work force. In the same year, it contributed 9.7 per cent total manufacturing output in developing countries and 4.6 per cent in developed countries. It accounted for 17.7 per cent in the Indian Subcontinent, 16.6 per cent in North Africa, 15 per cent in Western Asia, 10.6 per cent in Tropical Africa, 9.2 per cent in South-East Asia and 5.8 per cent in Latin America (see figure XXII for regional trends).

Between 1970 and 1985, textile output increased by 2.4 per cent per annum in developing countries and 1.5 per cent per annum in developed countries. As a result, the developing countries' share in world output increased from 19.5 to 21.7 per cent on the basis of a sample of 82 countries, or from 23.3 to 25.8 per cent on the basis of data from 165 countries.

The biggest changes in the structure of the world textile industry were made between 1965 and 1980. Great improvements in productivity were achieved in spinning and weaving, and employment in textiles fell sharply in North America, Western Europe and Japan. Growing imports of textiles from developing countries did not contribute to the decline, because the trade balance in textiles between North and South remained slightly in favour of the North.

Over the past 20 years developed countries have drastically reduced employment in the textile industry from 8.9 million to 6.8 million workers, mainly by better integrating the design, spinning, weaving and finishing stages of production and by establishing large manufacturing units and long production runs. In many countries, the Government provided financial assistance for restructuring and modernization of the industry. As a result, the value added per worker in 1985 in developed countries was $18,000, compared to $6,000 in developing countries.

The textile industry has become a capital-intensive industry in developed countries over the last 20 years. Adjusting for inflation, a shuttleless loom in 1982 cost 3.5 times as much as a fly-shuttle loom in 1950, but it could produce fabrics up to 4 times faster; the most modern ring-spinning mill requires a capital investment per worker 5 times the 1950 level; for rotor-spinning technology, capital-intensity increased 3 times between 1971 and 1983. Rotor spinning can raise the speed of yarn output by up to 4 times. The remarkable productivity increases achieved by these expensive investments have offset the higher wages paid in developed countries and some developing countries and made their textile industries highly competitive [75].

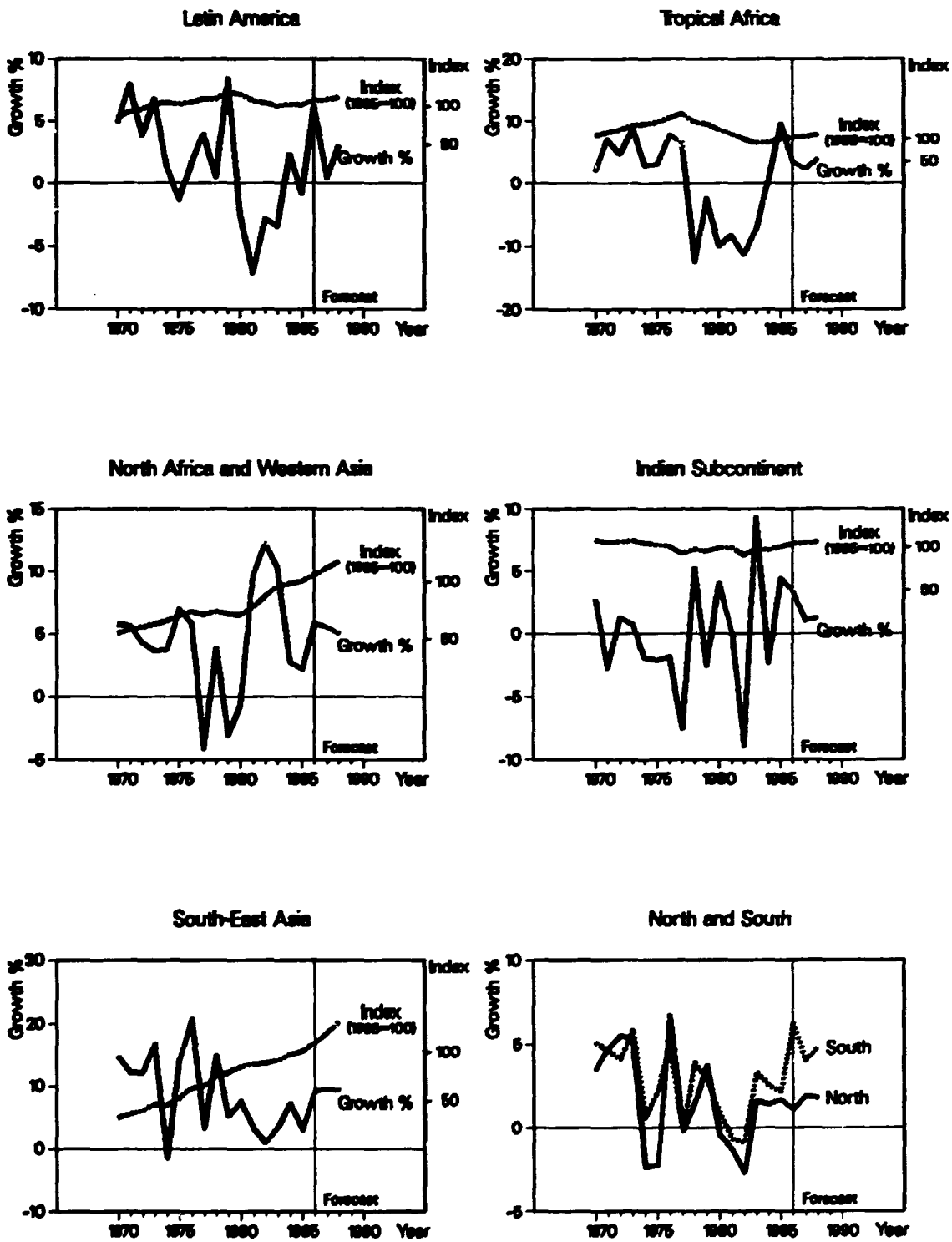
While the textile industry has become capital-intensive in developed countries, most developing countries and areas still use the labour-intensive spinning and weaving technology of the 1960s. The main exception to this generalization are China, Hong Kong, Republic of Korea and Taiwan Province, which have become major suppliers of world markets by investing extensively in modern textile machinery.

In Taiwan Province the textile and clothing industries accounted for 11.5 per cent and 2 per cent respectively of total manufacturing output in 1985. Between 1971 and 1981, output of textiles and clothing products increased fourfold and exports sevenfold. The textile industry's expansion was stimulated by government financial and tax incentives and by the availability of low-cost skilled labour. It was matched by the building up of a large domestic industry producing synthetic fibres. In 1985, exports of textiles were worth $2.5 billion and exports of clothing $3.5 billion.

In the Republic of Korea, the textile and clothing industries accounted for 10.5 per cent and 4.8 per cent respectively of manufacturing output in 1985. Between 1970 and 1981, the industry's spinning equipment quadrupled and the number of weaving looms tripled; in the clothing sector the growth was even faster, with the number of sewing machines increasing fivefold. A

*UNIDO acknowledges a contribution made by Herwig M. Strolz, Director of the International Textile Manufacturers Federation, Zurich.

Figure XXII. Textiles (ISIC 321)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SPVGLO.

threefold increase in real wages between 1973 and 1983 led the Government to take special measures to help the industry adapt. A special law for the modernization of the textile industry was adopted in 1979 and a special fund was created in which half of the money was provided by the Government and half by the industry. Loans to replace old equipment were made at low interest rates and the modernization programme was administered by the Korean Federation of the Textile Industry. By 1985 the export of textiles was worth $2.5 billion and exports of clothing $4.5 billion, accounting for 30 per cent of total exports [76].

In Hong Kong, the textile and clothing industries accounted for respectively 13.2 per cent and 22 per cent of manufacturing output in 1985. The main expansion of the textile industry took place prior to 1975, by which time clothing was the most important part of the industry accounting for more than 66 per cent of employment in the two branches of the industry. Most of the output of the textile and clothing industry is exported. To combat rising wage levels, both the spinning and the weaving sides of the textile industry have been modernized by replacing obsolete equipment. The clothing industry is one of the most efficient in the world; some enterprises have invested substantial sums in computer-controlled cutters. In 1985, exports of textiles were worth $3 billion and exports of clothing $6.7 billion.

The textile output of China has grown rapidly over the last 30 years. A comparison of cotton textile production in 1981 with that of 1952 shows that output of cotton yarns increased by 4 times, cotton fabrics by 2.9 times, worsted and woollens by 32.8 times and silk by 14.4 times. Consumption of fabrics in 1981 at 10.3 metres per capita was 81 per cent higher than in 1952. The tentative target is to double the 1980 output of the textile industry by 2000 and modernize the existing plant so that China's technological level is brought up to the world average level of the late 1970s and early 1980s. Exports accounted for 15 to 20 per cent of output in 1985. China's exports of textiles were valued at $3.5 billion and exports of clothing at $3.1 billion. Trade with Hong Kong has been included in these figures [77].

World exports of textiles in 1985 increased 3 per cent to a value of $55 billion. World trade in textiles and clothing continues to be regulated by the Multifibre Arrangement (MFA), which was extended for four years in June 1986. In July 1986, the United States signed bilateral agreements ([78], [79]) with its three main Asian suppliers covering imports of textiles and clothing up to 1991. Hong Kong agreed to limit the growth of its exports to 0.5 per cent in 1986, rising to 2.5 per cent in 1991, that is, by an average of 1 per cent per annum [80]. Under similar agreements, the growth of exports from the Republic of Korea is limited to 0.8 per cent per annum, and those of Taiwan Province to 0.5 per cent per annum. Thus, bilateral agreements have been tightened by setting quotas for "apparel" and "non-apparel" imports for each of the main types of fibre: cotton, wool, man-made fibres, silk and ramie [81].

EEC imports of textiles and clothing from Asia in the first six months of 1986 grew by 11.5 per cent and 15 per cent respectively [82]. Nevertheless, with the extension of the MFA, the EEC has been a little more liberal than the United States; this follows the much larger increase in imports into the United States that occurred in the four years 1982-1985. The EEC has agreed to annual increases of about 1 to 2 per cent higher than in the previous bilateral agreements. Indonesia has been given the largest annual increase of 6 per cent. The EEC will negotiate 23 bilateral agreements with its main textile and clothing suppliers from developing countries and China to implement the MFA over the period 1986-1990 [83].

Hence the outlook is for only slow growth of exports of textiles and clothing from Asian developing countries, mainly to the Western European and Japanese markets. Exports of the leading exporters—Hong Kong, Republic of Korea and Taiwan Province—will be almost frozen at existing levels in order to make more room for new textile exporters, in particular some of the ASEAN countries.

In the 1980s most developing countries have focused on producing textiles for domestic markets. In Latin America, output fell by 12 per cent between 1980 and 1985 and is unlikely to regain the record 1980 level before 1990. The emphasis is therefore on modernizing the existing industry by installing rotor spinning equipment and automatic looms.

In Tropical Africa, output of the textile industry fell by 15 per cent between 1980 and 1985. Shortage of spare parts and raw materials have constrained output more frequently than the lower level of demand. The present situation requires a more liberal approach to imports of spare parts and supplies and in some countries a programme of rehabilitation including the upgrading of skills in repair and maintenance of modern textile machinery.

In North Africa, output of textiles increased by 33 per cent between 1980 and 1985. In Western Asia, textile output rose by 45 per cent in this period. In these countries, some restructuring and modernization has taken place, and the industry should be able to keep up with fast-growing demand.

In the Indian Subcontinent, output of the organized sector increased by less than 2 per cent between 1980 and 1985. The policy is to support output in the informal sector, and hence part of the increase in output is not measured by industrial statistics.

In East and South-East Asia, output increased by almost 20 per cent between 1980 and 1985. This was much slower growth than in the 1970s because incomes increased less rapidly and further growth of exports of both textiles and clothing were restrained by the MFA. Some modernization of the industry was accomplished and more will be needed in the coming years.

(b) *Future prospects*

The output of the textile industry in developing countries is expected to increase by 4 per cent in 1987 and 4.8 per cent in 1988, and in developed countries by 2 per cent in 1987 and 1.9 per cent in 1988.

The fastest growth in textile output in developing regions is forecast for East and South-East Asia (9.6 per cent in 1987 and 9.4 per cent in 1988). Fast growth is also forecast for North Africa (6.6 per cent in 1987 and 5.5 per cent in 1988). In Latin America, the output of the textile industry declined during the early 1980s but began to recover in 1986. A 0.4 per cent increase in output in 1987 followed by a 3 per cent increase in 1988 is forecast. In the Indian Subcontinent output growth is expected to grow by 1 per cent in 1987 and 1.2 per cent in 1988. In Western Asia output is forecast to increase by 4.9 per cent in 1987 and 4.6 per cent in 1988. For Tropical Africa the forecast growth of 2.5 per cent in 1987 and 3.9 per cent in 1988 assumes that higher output can be achieved from the existing plants.

Most developed countries have modernized their yarn-spinning operation by installing rotor spinning; in 1983 more spinning capacity was created based on rotor spinning than on ring spinning. In general, developing countries continue to prefer ring-spinning technology. Hong Kong is the only developing area with a long-standing policy to invest in rotor spinning; Turkey and China have also recently begun to invest in this advanced spinning technology.

Shuttleless looms already account for most of the new looms purchased and installed in developed countries; in 1983, 7 out of 8 of the new looms installed were shuttleless. In developing countries and areas, the proportion was 1 out of 3; Taiwan Province has invested in shuttleless looms, but Brazil and the Republic of Korea continue to rely on locally built shuttle looms.

The new textile machinery introduced in developed countries allows enterprises flexibility in production, higher quality, more emphasis on styling and design and a move away from mass production of commodity fabrics to shorter runs of high quality fabrics. Customers in the apparel trade are increasingly requiring the finer yarns and lightweight fabrics that highly automated textile plants can produce.

The new strength of the automated textile industry in the North has acted to discourage further major expansion of export-oriented textile capacity in developing countries. The disincentive has been reinforced once again by the extension of the MFA in June 1986 for four years, a move that will continue the tight regulations on world trade in textiles. The concentration of developing country exporters on supplying the lower-cost commodity fabrics, including unfinished grey cloth, is likely to continue, as will the export of higher-quality fabrics from developed to developing countries for making up into clothing.

The main textile market for most developing countries in the period 1986-2000 will be the growing domestic market. The textile industry in many developing countries will require a higher level of investment in modernization over the next 15 years. Only a small part of the older weaving looms have been replaced, and only a few enterprises have modernized their design, spinning and finishing departments. The application of computers to fabric design and to the control of the manufacturing process and flow of materials in the textile industry has so far been made only on a limited scale in developing countries.

(c) *UNIDO activities*

UNIDO implemented many large-scale technical co-operation projects in the textile industry in the period 1981-1986, when total assistance exceeded $20 million or 6 per cent of UNIDO expenditure on assistance to specific industrial branches. The projects undertaken by UNIDO in 1986 in developing countries are listed in table 52.

Over the years UNIDO has helped many developing countries to improve skills in the operation of textile mills and the critical task of maintaining and adjusting spinning machinery and weaving looms. In 1986 assistance was provided to the National Textile Corporation in the United Republic of Tanzania. In Sri Lanka, UNIDO assistance in upgrading the quality of textile fabrics has encouraged clothing factories in the export processing zones to start making greater use of domestic fabrics. In Brazil, a project on rehabilitation of the knitting industry is nearing completion.

Jute is the main export crop of several developing countries, but it is being challenged in many uses by synthetic fibres such as polypropylene fibre. In 1986 a global project was launched on expanding the market for jute goods by the use of blends. In Bangladesh, UNIDO has strengthened the central testing laboratory for jute products and provided support for jute products research. In the United Republic of Tanzania, sisal is a major export crop, and UNIDO has strengthened production management and maintenance in the factory producing sisal bags. In China, UNIDO has helped to strengthen the Ramie Technology Development Centre. Ramie is a fibre that gained popularity in the 1980s because until mid-1986 it was not covered by the MFA. In the Philippines, UNIDO is helping to revitalize the silk industry. In Pakistan, UNIDO is providing assistance to woolen textile mills.

UNIDO helps to introduce modern technology at all stages of the design and production process. India is introducing computerized woven or printed designs, which have the added advantage of improved shade matching. In Bangladesh, textile mills in the private sector are installing production management systems. China and the Republic of Korea have established textile dyeing and finishing service centres, and India is applying research results in the production of "easy care" cotton fabrics.

The UNIDO programme of studies has drawn attention to the need for modernization and restructuring of the textile industry in developing countries. The report for ASEAN countries analyses the growing domestic markets for fabrics and highlights opportunities for interregional trade in textile industry inputs such as dyes as well as fabrics. The UNIDO study for the Government of Mexico on the restructuring of its textile industry called on the policy experience of Belgium, the Republic of Korea and Spain; the agreed long-term aim in Mexico is to make the textile industry more competitive in the large domestic market and in international markets. The implementation of projects to modernize the textile industry requires investment and hence close co-operation between UNIDO and national and international sources of finance.

Table 52. Selected UNIDO technical co-operation projects related to the textiles industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Bangladesh	UNDP**	1985-1986	Jute products research
	UNDP*	1979—	Central testing laboratories for jute goods
	UNDP**	1982—	Textile industry development programme
	UNDP	1982—	Strengthening of the College of Textile Technology
	UNDP*	1984—	Private textile mills—production management system
	UNDP	1984—	Promotion of the hand-knotted woollen carpet industry
Barbados	COFN*	1982—	Export promotion
Brazil	IDF	1983—	Rehabilitation and assistance to the knitting industry
	UNDP	1985—	High-level advisory service to the Centre of Technology of the Chemical and Textile Industry
China	COFN	1985—	Training course on repair and maintenance of textile machinery
	UNDP	1985—	Establishment of a China dyeing and finishing development centre
	COFN*	1985—	Strengthening of the China Ramie Technology Development Centre
Democratic Yemen	RP	1986—	Assistance in marketing of cotton cloth
Egypt	UNDP**	1977—	Textile Development Centre
India	UNDP**	1982—	Development of hosiery and knitwear industry
	UNDP*	1982—	Application of research results in easy-care cotton fabrics in the textile industry
	UNDP*	1986—	Instituting computerized woven or printed textile designs with added advantage of shade matching
Nigeria	UNDP*	1978—	Assistance in textile testing and quality control
Pakistan	UNDP*	1985—	Assistance to PIDC Woollen Textile Mills
Philippines	UNDP	1986—	Revitalization of national silk industry
Portugal	RP	1986—	Training in textile industry technology
Republic of Korea	UNDP*	1982—	Assistance to textile dyeing and finishing industry service centre
Sri Lanka	UNDP**	1979—	Establishment of a textile training and service centre
Syrian Arab Republic	UNDP	1984-1986	Assistance to the textile industry
Thailand	UNDP	1985-1986	Establishment of a textile unit
United Republic of Tanzania	UNDP**	1978—	Strengthening of the National Textile Corporation
	IDF**	1985—	Production of sisal bags—assistance in production management and machinery maintenance
Global	IDF*	1986—	Expanding the market for jute goods through the use of blends
Interregional	IDF	1982-1986	The production of high quality cotton knitgoods, Mexico City, 19-23 November 1984, Rio de Janeiro, May 1986

For footnotes see table 46.

5. *Wearing apparel (ISIC 322)*

(a) *Present situation*

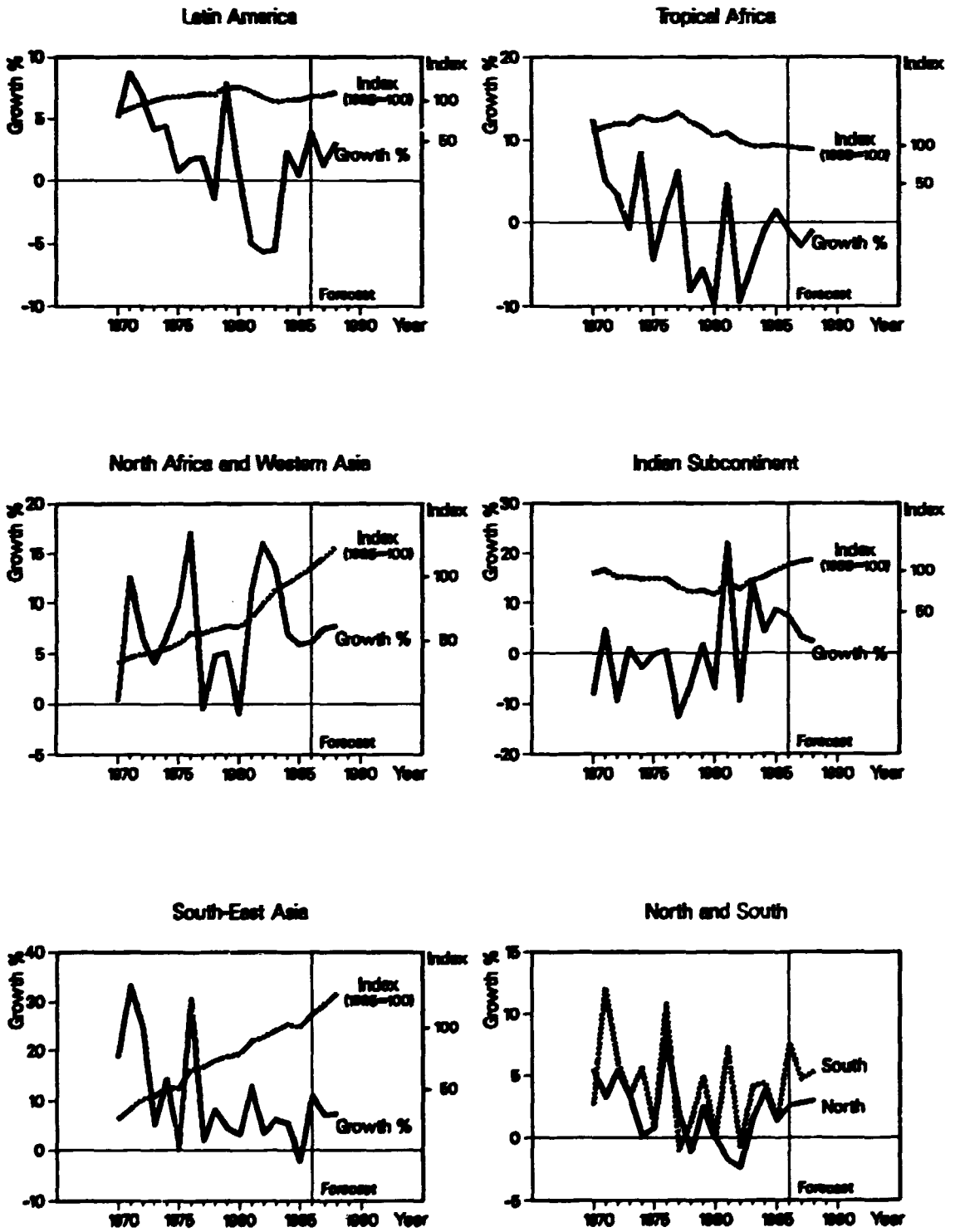
The contribution of the clothing industry to manufacturing output in 1985 was 3.5 per cent in developing countries and 2.8 per cent in developed countries. It was 5.5 per cent in South East Asia, where exports are a significant part of the output of some countries, 5.4 per cent in North Africa, 5.5 per cent in the Indian Subcontinent, 2.2 per cent in Western Asia, 2.3 per cent in Tropical Africa and 2.1 per cent in Latin America, (see figure XXIII for regional trends).

Between 1970 and 1985, the output of the clothing industry increased by 4 per cent per annum in developing countries and 1.7 per cent per annum in developed countries. As a result, the developing countries' share of world output rose from 10.8 per cent in 1970 to 14.3 per cent in 1985 on the basis of a sample of 82 countries, or from 12.2 to 15.7 per cent on the basis of data from 165 countries.

Clothing is a labour-intensive industry and developing countries were very successful in expanding their exports to developed countries in the 1970s. In the 1980s, further expansion has been more tightly regulated by the MFA. By 1984, developing countries accounted for half the developed countries' total imports of clothing worth $39 billion. About 60 per cent of developing countries' exports were sold to the United States and 25 per cent to the EEC; other Western European countries purchased 4 per cent, Japan 6.5 per cent and Canada 4.5 per cent. The principal suppliers of world trade in clothing over the period 1981-1985 are shown in table 53.

The imports of the United States continued to increase in 1985 and 1986, reaching $17.7 billion in the latter year, a market share of 23 per cent. Four Asian

Figure XXIII. Wearing apparel (ISIC 322)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/OLO.

Table 53. Exports of clothing by leading suppliers in developed and developing countries or areas, 1981-1985

(Billions of dollars)

Exporting country or area	*1981*	*1982*	*1983*	*1984*	*1985*
Developed countries					
Italy	4.32	4.4'	4.53	4.83	5.36
Germany, Federal Republic of	2.52	2.52	2.56	2.63	2.88
France	1.94	1.82	1.74	1.76	1.97
Portugal	0.58	0.65	0.70	0.83	1.97
United Kingdom	1.70	1.47	1.31	1.34	1.52
United States	1.26	0.99	0.88	0.85	0.72
Japan	0.58	0.55	0.66	0.78	0.73
Yugoslavia	0.66	0.61	0.51	0.59	0.56
Total	13.56	13.02	12.89	13.61	15.71
Developing countries or areas					
Hong Kong	5.01	4.73	4.68	5.96	5.73
Republic of Korea	3.86	3.78	3.70	4.50	4.50
Taiwan Province	2.85	2.90	2.99	3.76	3.51
Singapore	0.47	0.46	0.48	0.55	0.54
Turkey	0.31	0.40	0.65	1.27	0.54
Thailand	0.34	0.37	0.41	0.55	0.54
Philippines	0.35	0.31	0.32	0.55	0.54
Tunisia	0.33	0.33	0.33	0.29	0.54
Total	13.52	13.28	13.56	17.43	16.44

Sources: General Agreement on Tariffs and Trade, *International Trade 1984/85 and 1985/86* (Geneva, 1985 and 1986).

suppliers, China, Hong Kong, Republic of Korea and Taiwan Province, supplied 50 per cent of the 1986 imports. United States manufacturers also use Mexico and Caribbean countries as offshore manufacturing centres in which garments are made up to their specifications.

Western European countries have been modernizing the clothing sector and restructuring output so that it concentrates on the production of high-value garments. Nevertheless, the tide of imports has led to a substantial contraction of the industry in some countries. In Sweden, clothing output fell by 50 per cent between 1975 and 1982; output also fell in Luxembourg, the Netherlands and Norway by 30 per cent, in the Federal Republic of Germany by 20 per cent, and in the United Kingdom by 15 per cent. In France there was no decline and in Italy and Switzerland production increased by about 20 per cent.

There have also been sharp contrasts in the performance of the clothing industry among developing regions. Value added increased by 40 per cent in the Indian Subcontinent between 1980 and 1985 and in Western Asia by 50 per cent. Despite growing exports, output in East and South-East Asia increased less than 30 per cent in this period, reflecting the slower growth of the home market. In Latin America, clothing output fell sharply in the period 1981 to 1983 and in 1985 was still 13 per cent below the 1980 level. Output in Tropical Africa fell 10 per cent between 1980 and 1985, but in North Africa output gained 80 per cent in this period.

(b) *Future prospects*

The output of the clothing industry in developing countries is expected to increase by 4.7 per cent in 1987 and 5.3 per cent in 1988. In developed countries the output increase is expected to be 2.9 per cent in 1987 and 3 per cent in 1988.

The very rapid growth of the industry in North Africa is expected to continue with output forecast to increase by 9.9 per cent in both 1987 and 1988. Fast growth in output is expected in South-East Asia (7.1 per cent in 1987 and 7.4 per cent in 1988). In Western Asia, output increases of 4.7 per cent in 1987 and 5 per cent in 1988 are expected. In other regions, the cyclical nature of demand is apparent. In the Indian Subcontinent, growth is expected to slow to 3.3 per cent in 1987 and 2.2 per cent in 1988. The output increases forecast for Latin America are 1.2 per cent in 1987 and 3.2 per cent in 1988. For Tropical Africa a decline in output of 2.8 per cent in 1987 and 1 per cent in 1988 is forecast.

In most developing countries the emphasis will be on developing the clothing industry to supply the domestic market where demand may grow at about 4 per cent per annum in the future. Developing countries that seek to expand their exports of clothing to developed countries will find markets protected by import regulations implemented through a complex system of bilateral trade agreements [84].

The defensive position of developed countries reflects the fact that technological developments have so far failed to reduce significantly the labour-intensive nature of garment manufacturing. Although the introduction of robots is under consideration and the subject of active research programmes, an expert view is that the clothing industry is unlikely to have a fully tested and functional flexible manufacturing system until the mid-1990s. Until such systems are widely introduced, the tasks of picking up, positioning, manipulating and moving one or more pieces of fabric around the sewing machine will be a manual rather than an automated operation.

More progress has been made in using CAD systems for the rapid introduction of new clothing styles. When CAD is applied to the design of new clothes, computers can be used to mark and guide the cutting of cloth for the many different standard sizes of garment. The main advantage of this development is the quick response of manufacturers to the need for frequent changes in style and design that is typical of this industry [85].

The new found strength of the clothing industry in developed countries is also based on: the close link between the retailer, the clothing manufacturer and the producers of fabrics and man-made fibres, and the speed with which it can deliver new orders to the retailer. As a result of the introduction of computerized design and manufacturing systems, a reasonable target for the delivery of a new garment to the retail store is now three weeks from the date of the order. Developing countries that ship by sea can offer only a much longer delivery period for their clothing products. As a result, they are likely to continue to supply mainly the high-volume low-cost parts of the clothing market in developed countries.

(c) *UNIDO activities*

Rehabilitation of the garment industry has been the goal of UNIDO technical co-operation projects in

Table 54. Selected UNIDO technical co-operation projects related to the wearing apparel industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
China	UNDP	1985—	China garment technology development centre
Egypt	UNDP[e]	1986—	Establishment of a national garment, fashion and design centre
Lesotho	UNDP	1985—	Assistance to Peacock Garment Company Ltd. in improving its production techniques
Mexico	UNDP	1986—	Productivity and quality improvement in the garment industry
Mozambique	OTF	1986—	Assistance to OMM garment co-operatives in production organization and financial management
Tonga	UNDP	1986—	Rehabilitation of the garment industry
United Republic of Tanzania	UNDF	1984—	Assistance to the Kurasini Women Tailoring Society
Vanuatu	UNDP	1986—	Improvement of garment designing and manufacturing activity
Africa	IDF	1984—	Assistance to the Pan African Congress in the establishment of a women's garment manufacturing workshop

For footnotes see table 46.

Lesotho, Mozambique, Tonga and Vanuatu. Clothing has traditionally been a small-scale industry, and in most of these projects UNIDO assistance was designed to help a group of enterprises to introduce improved cutting of fabrics and modern production methods.

The clothing industry employs a high proportion of women, and projects for the Pan African Congress and the United Republic of Tanzania have assisted garment manufacturing by women. Fashion and garment designs are the focus of a new centre to be established for the clothing industry in Egypt with UNIDO assistance. UNIDO has also assisted a centre in China concerned with the development of garment technology and helped Mexico to improve productivity and quality in its garment industry (see table 54.)

6. *Leather and fur products (ISIC 323)**

Tanneries, leather finishing

Fur dressing, dyeing industries

Products of leather and leather substitutes, except footwear

(a) *Present situation*

The leather industry's contribution to manufacturing output in 1985 was 0.44 per cent in developed countries and 0.59 per cent in developing countries. It was 0.54 per cent in Tropical Africa, 1.13 per cent in North Africa, 0.61 per cent in Western Asia, 0.48 per cent in the Indian Subcontinent, 0.45 per cent in East and South-East Asia and 0.66 per cent in Latin America (see figure XXIV for regional trends).

Between 1970 and 1985, the output of the leather industry in developing countries increased almost three times as fast as in developed countries, that is, by 1.7 per cent versus 0.6 per cent per annum. As a result, the developing countries' share of world output of leather and leather goods rose from 12.8 per cent in 1970 to 14.8 per cent in 1985 on the basis of a sample of 82 countries, or from 14.6 to 16.2 per cent on the basis of data from 165 countries.

The growth of the leather tanning industry continues to be constrained by the limited availability of hides and skins. In 1985, and probably again in 1986, the total world availability of cattle hides and skins declined. The current situation is somewhat better in the case of skins derived from sheep and goats. Developing countries are the main source of the world's supply of sheep and goat skins, and the population of sheep and goats in many developing countries is increasing by 1 to 2 per cent per annum.

Production of cattle hides by the United States, the world's largest producer, fell by 3 per cent in 1985. In the EEC, utilization of bovine hides and skins fell by 10 per cent in 1985. Japan's utilization fell by 7 per cent and 100 tanneries closed in 1984 and 1985. In the USSR and Eastern Europe, the cattle population fell in 1985 for the first time since 1977. In Argentina, it declined by 1 per cent.

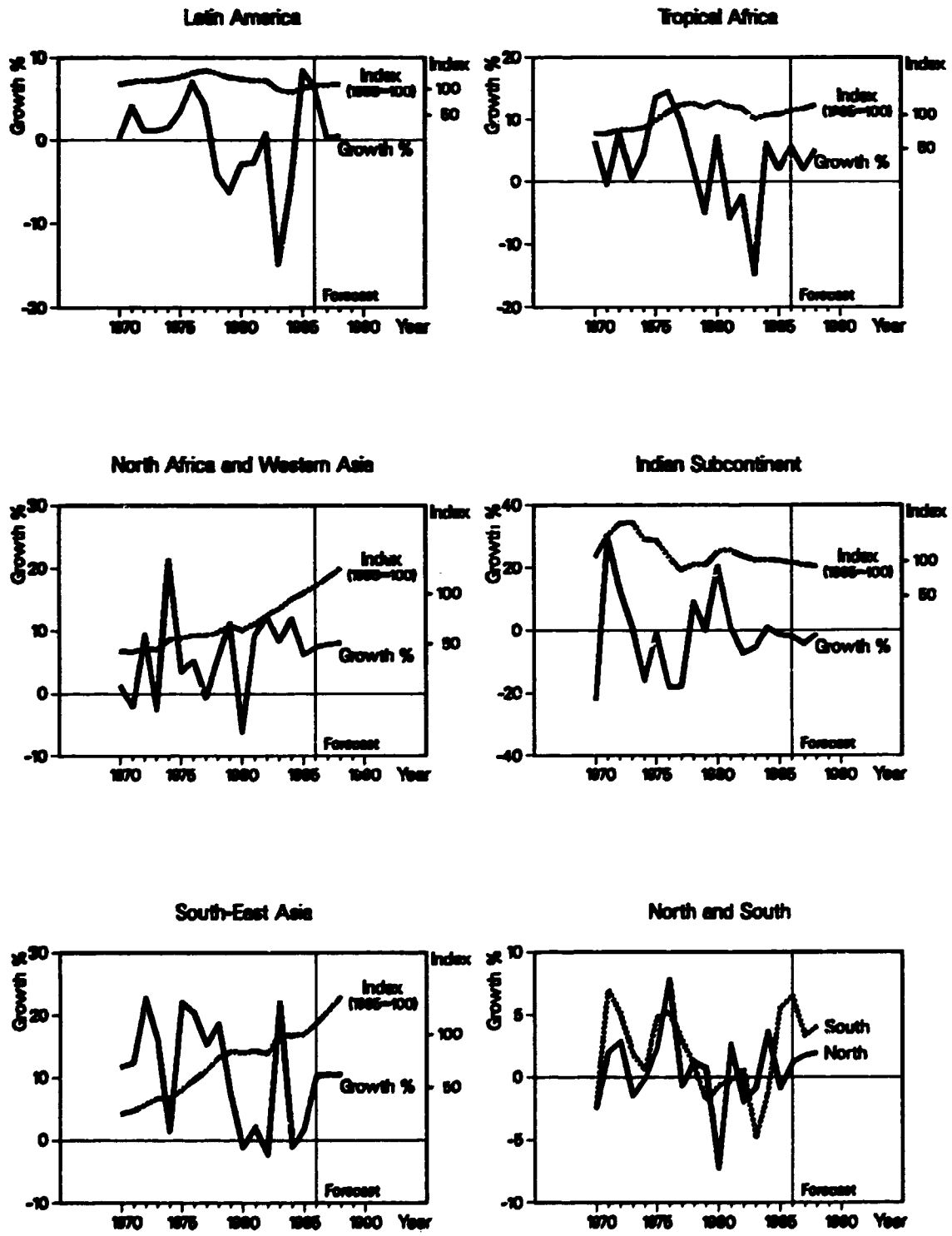
The main suppliers of the international market for hides in 1985 were the United States (24 million hides), Australia and New Zealand (6 million hides) and Africa (3 million hides). The main buyers were Japan (10 million hides), the USSR and Eastern Europe (8 million hides), Republic of Korea (7 million hides), Western Europe (5 million hides) and Mexico (3 million hides).

In 1986, the output of leather and leather products in most developed countries declined again. The only developed country where the output of leather products increased substantially in 1986 was Italy. Italy imports 75 per cent of its requirements for hides and skins and exports more than half its output of leather, leather goods and shoes. Exports of leather trebled in the four years to 1985 and a 30 per cent increase was expected in 1986. Exports of shoes at 400 million pairs in 1985 were a record. Exports of leather goods, leather accessories and gloves were also buoyant. This success has been achieved by careful selection of hides and skins and continued investment in modernizing tanneries, which have been subject to tough environmental control measures [86].

In Latin America, output of the leather industry increased in 1985 and 1986 but is expected to stagnate

*UNIDO acknowledges the contribution of Ian Howie, Editor of *Leather, International Journal of the Industry* (Kent, England).

Figure XXIV. Leather and fur products (ISIC 323)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SIVG.LO.

in the near future. In Argentina, less than 14 million cattle were slaughtered in 1986 compared to 16 million in 1978 and the reduced cattle herd means that supply of local hides will fall further in the future. Since output of shoes fell in 1985 and 1986, the domestic market used less leather. Exports of bovine leather were down to $250 million in 1985 compared to $400 million at the peak in 1979 but recovered to $285 million in 1986. Measures have been taken to stimulate exports of shoes and leather goods in the future [87].

In Africa, leather output has been growing steadily and there is a brighter outlook for the leather industry for the period 1986-1990. Modern tanneries have been established, and between 1977 and 1985 bovine leather output jumped from 7 million to 12 million skins and goat leather from 15 million to 18 million skins. Governments are trying to make their countries more self-sufficient in meat production and are implementing livestock improvement programmes, but the continent has one of the worst hide and skin recovery rates. Hides and skins are often so damaged as to be useless; a large proportion is still tanned by traditional methods and is suitable for local use only. Many of the bigger tanneries lack tanning chemicals and trained management. Coherent government policies on tanning and training and management assistance from abroad are still lacking in some countries.

Kenya has established a modern tannery which can process 750 million square feet of finished leather per year; a major proportion will be for export by air freight to European markets. Total cost of the project is put at $7.4 million. Leather Industries of Kenya Limited has attracted foreign equity and loan finance from the International Finance Corporation, the Development Company of the Federal Republic of Germany, the Belgian Corporation for International Investment and the Fund for Research and Development for the Development of Africa. A Belgian tanner, UTAMMO, is the technical collaborator and has responsibility for in-plant training. Training overseas has been promised by the Governments of Belgium and Italy [88].

In Asia, a rapid expansion of production of leather and leather goods is planned by India, Republic of Korea and Bangladesh in the period 1985 to 1990. The Republic of Korea is the world's fourth largest buyer of hides and skins to feed its booming leather and leather products industry. Over the last 12 years, output has grown by 30 per cent per annum. Exports reached $1 billion in 1984 and $1.5 billion in 1986. Some 50 per cent of the exports is accounted for by leather garments, of which the Republic of Korea is the world's largest exporter. At first competitiveness was based on low wages, but now it is based on investments in modern plant and equipment, manufacturing expertise and good design. The leather goods industry depends on a modern tanning industry that processes 30,000 pieces a day. Total leather production is put at 14.9 million square metres of which 67 per cent goes to shoe manufacturers, 29 per cent to leather garment producers and the rest to the leather products industry. A major innovation is the plan to move 23 tanners from metropolitan Seoul to a site 64 kilometres south where modern tanneries are being built [89].

India is the world's largest producer of hides and skins, accounting for 10 per cent of world output of goat and sheep skins and almost 7 per cent of world output of cattle hides. Until the late 1960s a large part of output was exported either as hides and skins or as semi-finished leather. Starting in the early 1970s, exports of hides and skins were banned, and then exports of semi-finished leather were made subject to additional duties and put under quota. As a result, around 75 per cent of leather production in India is now finished leather, 60 per cent of which is made up into finished goods.

The exports of the leather and shoe industries grew from $274 million in 1980-1981 to $486 million in 1984-1985, and the plan is to double export earnings by 1990. To achieve this the Government of India has decided to promote strong growth in the leather and shoe industry. To encourage the export of leather goods, it has reduced import duties substantially on machines for the tanning and leather products industry and on imported chemicals and components. The shoe industry is expected to increase exports from 20 million pairs in 1985 to over 100 million by 1990 [90].

Hides and skins are one of the most important raw materials of Bangladesh, the leather exports of which averaged $65 million in the period 1980-1985. The Government plans to obtain maximum value from them by exporting crust and finished chrome leather instead of wet-blue leather. Only 13 out of the 150 tanneries are equipped to make the change because both the leather tanning and the leather products industry use a low level of technology at present [91]. Hence a huge investment in the tanning industry (1,200 million taka) is provided for in the 1985-1990 development plan.

In Western Asia, Turkey has developed sizeable exports of leather garments (worth $240 million) and total exports of the leather and leather products industry were valued at $440 million in 1984. The tanning industry uses modern equipment mainly imported from Western Europe (bearing import duty at up to 50 to 70 per cent). Domestic sources of chemicals have been developed. More than half the country's leather goes to the footwear industry which produced 95 million pairs in 1984. Only 3 million pairs were exported up to 1982, but since then Adidas has begun to produce football boots and tennis shoes in Turkey, and Puma shoes are now produced and exported [92].

(b) *Future prospects*

The output of the leather and leather products industry in developing countries is expected to increase by 3.2 per cent in 1987 and 3.9 per cent in 1988. In developed countries, the forecast increase in output is 2 per cent in 1987 and 1.9 per cent in 1988.

In East and South-East Asia output growth of 10.5 per cent both in 1987 and in 1988 is forecast. Rapid growth at 6.8 per cent in 1987 and 6.9 per cent in 1988 in Western Asia and at 8.9 per cent in 1987 and 9.1 per cent in 1988 in North Africa is also expected. Limited supplies of leather remain a constraint in Latin America, where no increase in leather output is forecast for 1987 and 1988. Since Latin America accounts for 50 per cent of the South's output, this halves the average rate of growth in

developing countries as a group. But substantial growth in output is expected on the Indian Subcontinent, where the Indian Government has made leather a priority industry for expansion.*

Although the growth of this industry in developed countries and Latin America is constrained by a shortage of hides and skins, a steady growth of leather supplies is expected in Tropical Africa, the Indian Subcontinent and other Asian countries. Nevertheless, some developing countries (Brazil, India, Republic of Korea, Turkey) will be competing with developed countries for a limited supply of hides and skins as they continue to make the leather and shoe industries a part of their thrust into export markets.

In African and some other developing countries, the first priority is to establish a sound basis for the industry with better animal husbandry, improved recovery and better quality hides and skins. Once these are available the incentive to develop modern tanneries will be stronger.

Modern technology has brought major improvements in the tanning and processing of leather. Computers can help select the best way to cut a piece of leather. The rapid development of electronic sensors can help detect defects in a piece of leather, but the selection and processing of leathers of high quality will always remain as much an art as a science despite these advances.

*UNIDO's statistical forecasts do not reflect the world shortage of hides and skins because increases in value added included an allowance for higher leather prices.

(c) *UNIDO activities*

Major UNIDO technical co-ordination projects in 1986 are listed in table 55. The projects with the broadest impact are those that have established or

Table 55. Selected UNIDO technical co-operation projects related to the leather and fur products industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Africa	RP	1985-1986	Integrated development programme of the leather and leather products industry in selected African countries
Brazil	IDF*	1980—	Assistance in the establishment and operation of a pilot and demonstration plant for tannery effluents treatment
Burma	UNDP	1982-1986	Development Centre for Leather Technology—preparatory assistance
China	UNDP/IDF*	1985—	Assistance to the Leather Technology Centre, Shanghai
Costa Rica	OTF*	1982-1986	Asistancia al Centro de Tecnologia del Cuero
Democratic Yemen	IDF	1979-1986	Machinery and equipment for the National Tanning Factory
Dominican Republic	IDF	1984—	Assistance in the establishment of a leather quality laboratory
Hungary	OTF	1984-1986	Specific assistance to the Ministry of Industry
India	UNDP*	1982—	Strengthening of the college of leather technology
Indonesia	UNDP*	1985—	Assistance in research and development activities in leather and allied industries
Jamaica	UNDP	1985-1986	Assistance in the vegetable tanning of goat skins
Kenya	IDF*	1984—	Leather development centre
Lesotho	RP	1986—	Assistance to Basotho Tanning Company Ltd.
Montserrat	RP	1986—	Training in leatherworks
Nepal	UNDP	1986—	Revitalization of the Hetauda Leather Industries
Pakistan	UNDP*	1979—	Leather products development centre
Peru	UNDP	1981—	Assistance to small-scale leather and tannery industry
Philippines	IDF**	1985—	Upgrading of the footwear and leather goods training and demonstration centre
Rwanda	IDF	1986—	Assistance préparatoire dans l'établissement d'une industrie du cuir et d'articles en cuir
Somalia	OTF	1986—	Sectoral study on hides, skins, leather and leather products trade and industry
Sri Lanka	UNDP*	1981—	Assistance to the Ceylon Leather Products Corporation
Sudan	IDF	1983-1986	Assistance to the public sector tanning industry
United Republic of Tanzania	IDF	1979-1986	Assistance to the leather and leather products industry pilot plant
	UNDPTF	1982—	Establishment of a leather goods unit
Viet Nam	UNDP	1985—	Assistance to the leather industry research centre

For footnotes see table 46.

strengthened a national centre for leather technology and development servicing the existing industry. Such projects were operating in Burma, China, Costa Rica, Dominican Republic, India, Kenya and Viet Nam. Broad assistance has also been provided in the production of leather and leather products in Indonesia, Pakistan and Sri Lanka.

Recognizing the potential for the leather industry in Tropical Africa, UNIDO initiated preparatory investigations in 1986 for an integrated development programme for the leather industry in selected African countries. In addition, assistance has been provided to a tannery in Lesotho, for the production of leather goods in the United Republic of Tanzania and in the form of a survey for the establishment of the leather industry in Somalia.

Jamaica has been assisted in the vegetable tanning of goat skins. Machinery and equipment has been supplied to the National Tanning Factory in Democratic Yemen. The leather industry can damage the environment and UNIDO has been called on to advise on the treatment of tanning effluents in Brazil.

The UNIDO Investment Promotion Service promoted investment in a tannery in Malawi in 1985; total cost of plant and equipment was $1.6 million. Investment was promoted in a tannery in Bangladesh in 1986; total investment was $1.1 million.

UNIDO has held three world-wide Consultations on the leather, leather products and shoe industries, in 1977, 1980 and 1984.* They have created a forum for tanners and leather specialists to meet and discuss international co-operation in this industry. They have focused attention on the opportunities to increase world leather supplies by better handling of hides and skins, installing modern tanneries in developing countries and maintaining free trade and avoiding protectionism.

7. *Footwear (ISIC 324)*

(a) *Present situation*

Because leather supplies are limited, plastic, rubber and fabrics have replaced leather in the manufacture of shoes. In the late 1970s the fashion trend for boots required more leather. Casual shoes made of fabrics with moulded rubber bottoms and using little leather have been a major fashion trend of the 1980s. Only the more expensive shoes now have leather soles as well as leather uppers. Shoes use about 50 per cent of leather supplies in both developed and developing countries.

The footwear industry makes a larger contribution to manufacturing output than the leather and leather products industry, namely 1.1 per cent in developing countries and 0.7 per cent in developed countries in 1985. Its contribution was 0.82 per cent in South-East Asia, 1.06 per cent in the Indian Subcontinent, 1.11 per cent in North Africa and Western Asia, 1.6 per cent in Tropical Africa and 1.24 per cent in Latin America. Substantial exports account for the industry's larger-than-average contribution to manufacturing output in Taiwan Province (1.47 per cent) and in the Republic of Korea (0.94 per cent) (see figure XXV for regional trends).

Value added in the shoe industry increased in the period 1970 to 1985 by 3 per cent per annum in developing countries and 0.5 per cent in developed countries. As a result, the developing countries' share of world shoe output grew from 12.6 per cent in 1970 to 17.2 per cent in 1985 on the basis of a sample of 82 countries, or from 14.2 to 18.9 per cent on the basis of data from 165 countries.

The number of shoes produced in a sample of developing countries and areas increased by 4.5 per cent per annum between 1973 and 1982. The largest producers of footwear in the South are Argentina, Brazil, Egypt, Indonesia, Mexico and Nigeria. The most important exporters are Republic of Korea ($1,352 million in 1984), Brazil ($871 million in 1983), Hong Kong ($237 million in 1984) and Taiwan Province (no data available). In comparison, Italy exported $3,503 million worth of shoes in 1984.

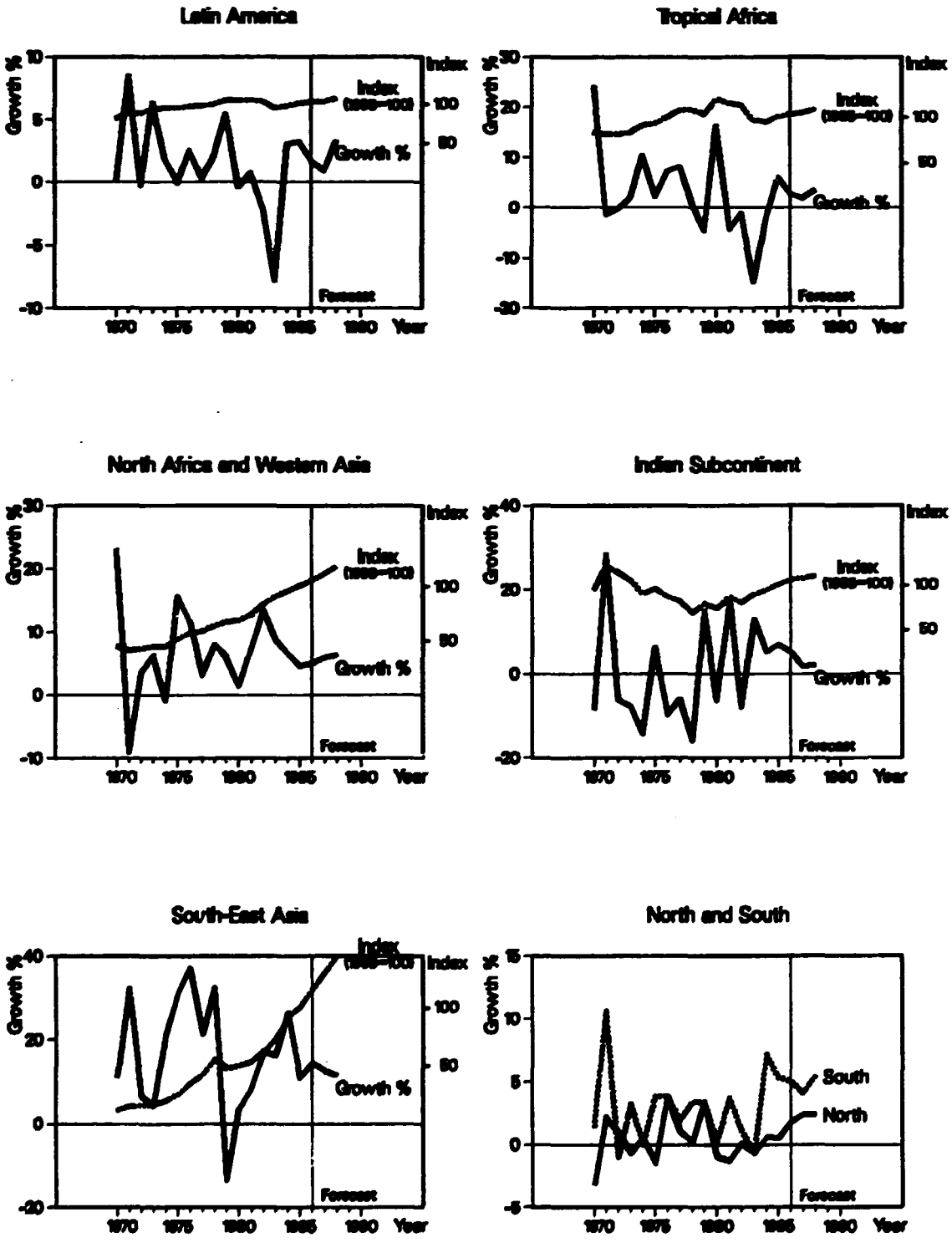
The increase in exports of these developing countries and developed countries such as Italy, Spain and Yugoslavia over the last 10 years has brought about some restructuring of the shoe industry at the world level. In 1985, Western Europe exported 515 million pairs of leather shoes and the USSR and Eastern Europe 83 million pairs. Brazil exported 120 million pairs, the Republic of Korea 99 million and China 84 million. Developing countries have exported both leather shoes and component parts of leather shoes (soles and uppers). They have also developed exports of low-cost shoes made of rubber, canvas and plastic. A few countries like Brazil have been successful as suppliers of more expensive, up-market shoes where style, quality and design are important.

The output of shoes in developed countries as a group has increased very little since 1975. The level of output has been falling in North America and 100 factories closed in the United States in 1984 when the flood of imported shoes reached its peak. In 1986, shoe output fell further, to 230 million pairs and imports rose from 843 million pairs in 1985 to 950 million pairs in 1986. In Western Europe, imports have supplied a growing share of the market over the last 10 years. The footwear industry in Western Europe again stated its case for greater protection in 1986. But in May, the EEC turned down a plea for a special inquiry into the problems of the industry [93]. The EEC Commissioner responsible pointed out that although footwear imports had increased in 1985, the EEC still had a positive trade balance.

Although Japan's shoe industry has been tightly protected from competition from abroad, output of leather shoes increased by only 1.4 per cent per annum between 1975 and 1984 to 56 million pairs. Up to February 1985 imports were restrained by a quota, thought to be about 1 million pairs. Since February 1985 imports up to 4.5 million pairs have been allowed, but they are charged import duty of 27 per cent; imports beyond this level pay duty of 60 per cent. In the first six months of 1986, imports reached an annual rate of 3.5 million pairs, including a large

*See the reports of the First, Second, and Third Consultations on the Leather and Leather Products Industry (ID/ /G.358/9, ID/255 and ID/318).

Figure XXV. Footwear (ISIC 324)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SPR/GLO.

quantity of training and jogging shoes imported from the Republic of Korea [94]. Despite the expansion, shoe imports into Japan are still well below the level in the EEC (33 per cent of the market) and in the United States (70 per cent of the market).

Output has increased in the USSR and Eastern Europe regions in the last 10 years, and these regions exported 83 million pairs in 1985. The USSR footwear industry is constructing the world's largest footwear components factory. It will be of advanced design, using robots and fully automated systems of Italian origin. A contract valued at $70 million to supply the factory on a turn-key basis has been signed between an Italian consortium and the Ministry of Light Industry [95].

China's output of shoes increased by 6.6 per cent per annum from 1973 to 1982. China has also become a large exporter of footwear. In 1984 it exported 27 million pairs to France, 23 million to Italy, 20 million to the United States and 9.5 million to the Federal Republic of Germany.

The Government of India has set bold plans for the expansion of the production and export of shoes and shoe components such as leather uppers. Output of 300 million pairs of shoes in 1984-1985 is expected to reach 440 million pairs by 1990. Exports are expected to rise from $132 million in 1984-1985 to over $700 million in 1990. Incentives are available to firms that export 75 per cent of their production; foreign partners can buy out up to 40 per cent of such Indian producers [96].

In 1985, the Republic of Korea produced 381 million pairs of shoes, of which 259 million pairs were exported. Producers in the Republic of Korea were quick to develop capacity to meet the new demand for training and jogging shoes in the 1980s; more recently they have moved up-market into lines of shoes using leather. As a result, exports of shoes in the first five months of 1986 were at an annual rate of $1.7 billion. Although the major buyers are in the United States, training and jogging shoes made in the Republic of Korea are sold in at least 25 countries.

In Thailand, shoemaking is undertaken in 2,000 small family businesses. They can produce up to 36 million pairs of shoes per year. Shoe exports increased from 52 million baht in 1979 to 672 million baht in 1983. The industry has to cope with higher leather prices, the tendency to export the best quality leather and the need to import adhesive and tanning dyes.

(b) *Future prospects*

The output of the shoe industry in developing countries is expected to increase by 4.1 per cent in 1987 and 5.4 per cent in 1988. In developed countries, shoe output is expected to increase by 2.5 per cent in 1987 and 2.4 per cent in 1988.

Over the past 15 years, output of shoes has grown fastest in South-East Asia. This trend is expected to continue with output increases of 12.6 per cent in 1987 and 11.6 per cent in 1988. Output increases in Western Asia of 3.7 per cent both in 1987 and in 1988 are forecast. In North Africa large output increases of 7.6 per cent in 1987 and 8.1 per cent in 1988 are expected. Output is forecast to grow slowly in Latin America (0.9 per cent in 1987 and 3.3 per cent in 1988) and in Tropical Africa (1.9 per cent in 1987 and 3.4 per cent in 1988). In the Indian Subcontinent output may increase faster than past trends suggest (1.7 per cent in 1987 and 1.9 per cent in 1988) due to increased exports.

Rapid population growth will ensure a steady increase in the demand for shoes of 4 per cent per annum in developing countries and further development of the industry is likely to focus mainly on supplying these domestic needs. As supplies of leather are not growing as rapidly as the demand for shoes in most countries, the trend towards the manufacture of shoes from rubber, canvas and plastic will continue.

World restructuring of shoe production has probably reached its limits. Import penetration may increase further in Japan but fall in the United States. Exports of shoes from developing countries will continue to be most successful in the high-volume, low-cost market, but a few developing countries may compete successfully in the fashion market. Their success is likely to be limited by the distance from the market and the improved competitiveness of the domestic shoe industry in developed countries.

Automation was introduced to the shoe industry much later than in other industries. As a result, there is still considerable scope for making wider use of CAD and full automation of the manufacturing process. These advances will make the industry much more capital-intensive. Modern plants require fewer employees and will probably lead in time to greater concentration in large firms as compared with the present small-scale level of operations.

Some shoe-manufacturing enterprises in developed countries have already adopted advanced manufacturing technology to increase flexibility in developing new designs so as to respond more quickly to customer needs. Computer-aided design and engineering (CAD/CAE) systems are expensive and still largely experimental. Screen images in three dimensions would reduce sample preparation of new shoes and enable the effects of changes in style and construction to be seen and evaluated quickly.

Computers have already been applied to planning and controlling manufacturing and inventory systems with considerable cost savings. Computer-programmed machines for stitching, lasting and roughing are being introduced to reduce labour requirements. Other technical improvements have been in the cutting of leather and moulding or trimming other materials to the required dimensions.

(c) *UNIDO activities*

UNIDO technical co-operation projects in the shoe-manufacturing industry are listed in table 56. The emphasis of assistance to the existing industry varies from project to project. Argentina is interested in increased exports of shoes. Egypt aims at improving the manufacture of footwear components and accessories. Improving the technology of footwear production is the goal of projects in Cuba, Pakistan and the Philippines.

Table 56. Selected UNIDO technical co-operation projects related to the footwear industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Argentina	UNDP	1985—	Assistance to the shoe industry—export development
Burma[d]	UNDP	1982-1986	Development Centre for Leather Technology—preparatory assistance
China[d]	UNDP/IDF*	1985—	Assistance to the Leather Technology Centre, Shanghai
Cuba	UNDP	1984—	Technical assistance in development of footware technology
Egypt	UNDP	1985—	Advisory service on the manufacture of footwear components and auxiliaries
India[d]	UNDP*	1982—	Strengthening of the college of leather technology
Pakistan	UNDP	1984—	Assistance to the Hyderabad Leather Footwear Centre
Philippines	IDF**	1985—	Upgrading of the footwear and leather goods training and demonstration centre
Sri Lanka[d]	UNDP*	1981—	Assistance to the Ceylon Leather Products Corporation
United Republic of Tanzania[d]	IDF	1979-1986	Assistance to the leather and leather products industry pilot plant

For footnotes a, b and c see table 46.
[d]Listed also in table 55.

8. *Wood and wood products (ISIC 331)**

Sawn lumber, plywood, particle board, veneers
Wooden containers
Other wood products, except furniture

(a) *Present situation*

This industry makes a modest contribution to manufacturing output, amounting to 2.3 per cent in developing countries and 2.1 per cent in developed countries. Between 1970 and 1985, the annual increase in output of wood and wood products was much faster in developing countries (3.9 per cent) than in developed countries (1.2 per cent). As a result, the developing countries' share of world output increased from 8.7 per cent in 1970 to 13.9 per cent in 1985 on the basis of a sample of 82 countries, or from 9.9 to 13.8 per cent on the basis of data from 165 countries (see figure XXVI for regional trends).

In 1985 and 1986 the wood and wood products industry in North America began to recover from the weak demand of the period 1982-1984, caused mainly by high interest rates. The level of activity in the housing and construction industries picked up and production of sawn wood in the United States increased by 2.6 per cent in 1985 and 4.2 per cent in 1986.

There was little increase in the industry's output in Western Europe in 1985 and 1986. After the strong recovery in 1984, output of sawn wood stagnated; output of wood-based panels (particle board, plywood and fibre board) increased 2 per cent in 1985 and stagnated in 1986. Output will increase slowly in 1987 and 1988 unless the depressed level of activity in the housing and construction industries responds strongly to lower interest rates.

In Eastern Europe and the USSR, output increased by 4.7 per cent in 1984 and 3.7 per cent in 1985, faster than in other developed regions.

In Japan, activity in both the housing and construction industries increased steadily in 1985 and 1986 and the outlook is for further advances in 1987 and 1988 stimulated by very low interest rates. However, the long-term trend is to use less wood and rely more on imports. The wood and wood products industry has lost competitiveness and is facing increasing difficulties in importing logs for sawing in Japan. Output of sawn wood and plywood contracted in 1985 and 1986 and this trend is likely to continue in 1986 and 1987.

In China, demand for wood and wood products has increased, but supply has been constrained by the country's limited forest resources. Imports of softwood and hardwood logs have increased sharply, costing $0.75 billion in 1985. Plywood imports have increased to the point where they supplied 25 per cent of demand in 1985. Government policy aims at making China self-sufficient in wood by 2000 by expanding the forest area from 12 per cent to 20 per cent of the total land area. In the meantime, the development of substitutes for wood such as steel in construction is being pushed vigorously. Annual output of wood panel products, including those that utilize sawmill waste, is expected to increase by one third by 1990.

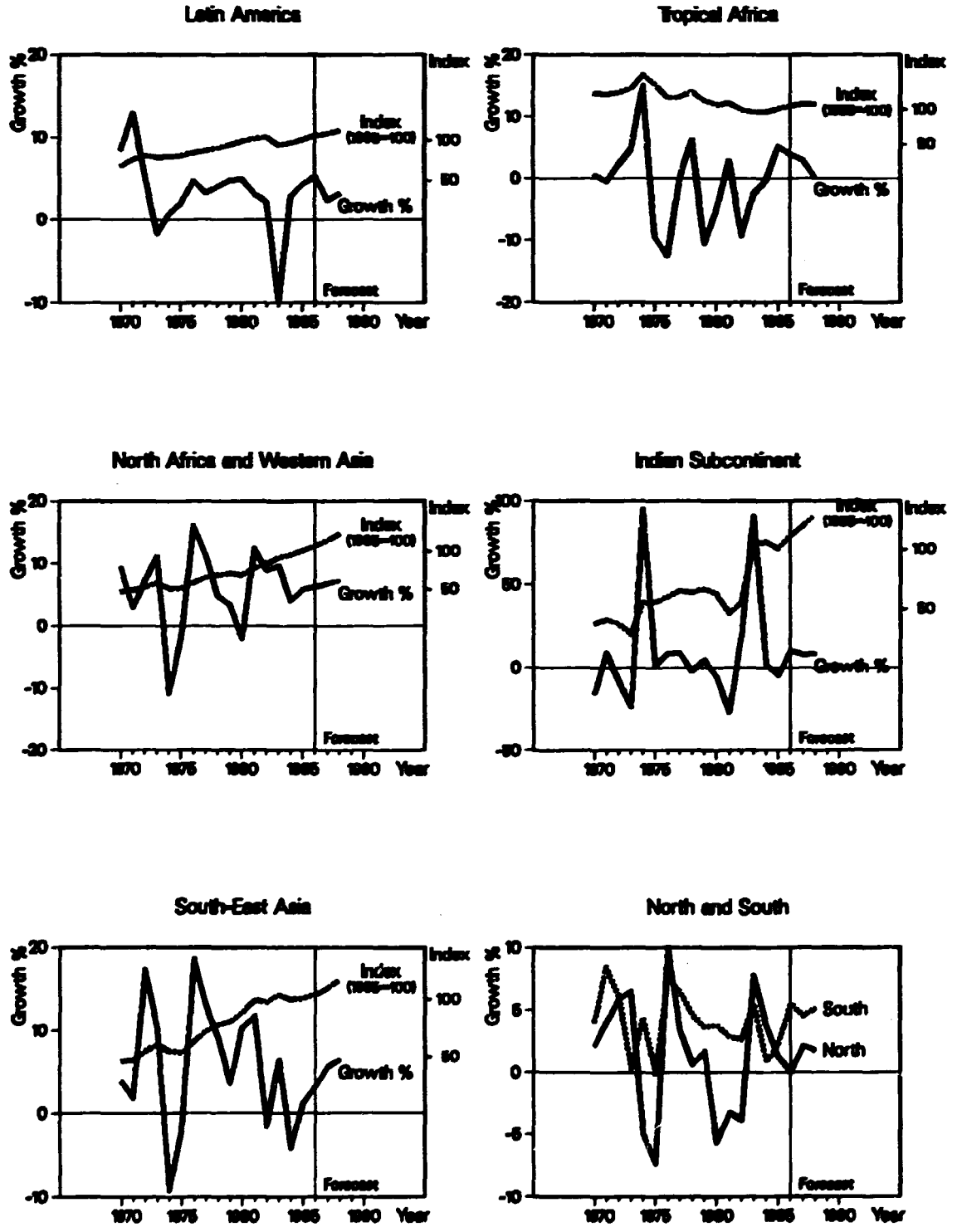
The largest producers of sawn wood and plywood in 1984 among developing countries are listed in table 57.

India launched a forestry development plan in 1985 aimed at increasing forests by 5 million hectares a year and raising the level of forested land to 35 per cent of total land area (the 1947 level) compared to 10 per cent in 1985. However, in the near future, the scope for increasing output of sawn wood and wood-based panel products is limited.

Indonesia's output of wood and wood products has increased sharply since 1980 and contributed to increased export earnings. Indonesia is the world's largest exporter of hardwood plywood; exports of 3.76 million cubic metres in 1985 were three times the 1982 level. Lumber production, up 4 per cent in 1985, has continued to grow despite weaker domestic demand. Indonesia's move towards the end of 1986 to

*UNIDO acknowledges a contribution on this industry from Jean Kloos, Editor, *Timber Trades Journal* (London).

Figure XXVI. Wood and wood products (ISIC 331)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SPI/GLD.

Table 57. Largest producers of sawn wood and plywood among developing countries and areas in 1984

(Millions of cubic metres)

Country or area	Production of sawn wood	Country or area	Production of plywood
China[a]	24.41	Indonesia	3.82
Brazil	15.85	China[a]	1.63
India	10.98	Republic of Korea	1.30
Malaysia	7.28	Brazil	0.90
Indonesia	6.32	Malaysia	0.79
Nigeria	4.53	Singapore	0.48
Turkey	4.12	Philippines	0.41
Republic of Korea	3.52	Mexico	0.29
Chile	2.00	Thailand	0.16
Mexico	1.71		

Source: Food and Agriculture Organization of the United Nations, *1984 Yearbook of Forest Product Statistics* (Rome, 1984).

[a]Including Taiwan Province.

ban certain hardwood exports has caused concern to buyers, particularly in Taiwan Province, where its timbers are used in the furniture and mouldings industries. Indonesia is planning to develop its own manufacturing facilities for furniture and mouldings production as a further means of using its vast forest reserves. The stance taken by Indonesia has been adopted by other major exporters of wood such as Malaysia and the Philippines.

For Papua New Guinea, forest products are the third largest source of exports, worth over $80 million in 1984. Most of the wood is exported as logs, and unlike other South-East Asian countries, government policy provides for a relaxation of the restriction of log exports. A considerable part of the forest area deemed usable has yet to be exploited.*

The wood and wood products industry in Tropical Africa has begun to benefit from improved demand in Western Europe. As China and Japan have become the major buyers of Asian plywood, European importers have begun to turn back to their traditional African suppliers. Although many African countries have problems with deforestation, countries such as Cameroon, Gabon and Zaire still have sufficient wood resources to increase their export trade. Other countries such as Côte d'Ivoire and Ghana intend to process locally more of their wood into wood products. Ghana has banned exports in the form of logs for 14 commercial species of wood, and Côte d'Ivoire is encouraging exports of processed wood products.

The raw material base for this industry has suffered from the extensive use of wood as fuel in rural areas and the deforestation that results. In the future more African countries are likely to follow the example of Zimbabwe, where a major commercial programme of afforestation was completed in the 1960s. Today, 25 years later, Zimbabwe is self-sufficient in lumber and has sufficient pulpwood resources to consider establishing a pulp mill.

Although the level of housing and construction activity recovered in several Latin American countries in 1986, the wood and wood products industry continues to be affected by weak demand. Lack of effective reforestation continues to be a problem throughout Latin America; for the region as a whole only one out of 10 hectares cut is replanted.

In Brazil the stimulus for exports of wood and wood products weakened in 1986. In February 1986 internal prices were frozen, but few buyers adhered to government-determined levels, leading to an internal price spiral. Exports of both lumber and panel products dwindled, but further measures are expected to revitalize exports in 1987.

Chile is Latin America's largest exporter of wood; the output of roundwood increased 8 per cent in 1985 and exports increased 14 per cent. Chile is followed by Brazil, Paraguay and Honduras. Only Brazil exports large quantities of plywood and fibreboard. Many countries recognized the potential for increasing exports. The Government of Brazil believes that the rich resources of the Amazon Forest, comprising 35 per cent of the country land area, contain usable species of wood that have not hitherto been exploited commercially.

(b) *Future prospects*

The output of wood and wood products in developing countries is expected to increase by 4.5 per cent in 1987 and 5.2 per cent in 1988. In developed countries, output is expected to increase by 2.2 per cent in 1987 and 2.0 per cent in 1988.

Among the regions of the South, the industry is expected to expand fastest in South-East Asia (5.7 per cent in 1987 and 6.9 per cent in 1988), and in Western Asia (7.2 per cent in both 1987 and 1988). Strong demand is expected in the Indian Subcontinent (7.9 per cent in 1987 and 8.1 per cent in 1988). Weak demand will limit output growth in Latin America (2.3 per cent in 1987 and 3.1 per cent in 1988), and in Tropical Africa (3.0 per cent in 1987 and 0.1 per cent in 1988).

As supply and demand in world production of softwood, hardwood and panel products is reasonably well balanced, prices are expected to remain stable in 1987, although there may be seasonal fluctuations.

FAO estimates that between 1980 and the year 2000, demand for wood in developing countries will double and demand for wood-based panels and paper

*As reported by the Forest Industries Council of Papua New Guinea in *World Wood*, October 1986.

Table 58. Selected UNIDO technical co-operation projects related to the wood and wood products industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Bolivia	IDF	1984—	Apoyo a la rehabilitación de puentes en áreas declaradas en emergencia
Bhutan	UNDP*	1984—	Low-cost modular prefabricated wooden bridges
Cape Verde	RP	1986—	Assistance for quality control of imported wood
Chile	UNDP	1984—	Development of modular wooden bridges
Colombia	IDF	1986—	Exploratory mission for wooden bridge construction
Côte d'Ivoire	UNDP	1984-1986	Techno-economic study for the production of moulded panels from coconut fibres
	RP	1986	Assistance for quality control of imported wood
Dominica	IDF	1983-1986	Wooden bridge construction
Ecuador	IDF	1983—	Apoyo a la rehabilitación de puentes en áreas declaradas en emergencia
	UNDP*	1985—	Low-cost modular prefabricated wooden bridges
El Salvador	UNDP	1986—	Wooden bridges
Fiji	UNDP	1986—	Assessment on power generation in Labaza using bagasse and/or wastewood
Ghana	COFN	1986—	Promotion of external trade
Guyana	UNDP	1984-1986	Construction of a prototype solar timber-drying kiln
	UNDP	1986	Development of secondary wood-processing industries
Honduras	UNDP	1981-1986	Desarrollo de puentes prefabricados de madera (extensión)
	UNDP	1984-1986	Timber bridge construction
	IDF	1985—	Mobile timber preservation plant
Indonesia	IDF	1985—	Feasibility study to assist in establishing a modern wooden building and repair industry in Irian Jaya
Madagascar	IDF	1981—	Production of prefabricated modular wooden bridges
Mongolia	UNDP	1986—	Assistance in the development of wooden handicraft
Montserrat	IDF	1986—	Construction of a solar wood drying kiln
Nicaragua	IDF	1983—	Development of prefabricated modular wooden bridges
	UNDP	1986—	Timber preservation for construction
Peru	UNDP	1984—	Development of prefabricated modular wooden bridges
Solomon Islands	UNDP	1986—	Assistance to the wood processing industry
Togo	RP	1986—	Techno-economic feasibility study for a wood-based panel plant
Viet Nam	UNDP	1980—	Production of wooden textile industry accessories
Africa	COFN*	1982—	FAO/ECA[d]/UNIDO—Forest industries advisory group for Africa
Asia and the Pacific	COFN	1981-1986	Regional coconut wood training programme
	IDF	1984-1986	Training course on coconut wood building, Philippines, 20-28 February 1985
Latin America	IDF	1986—	Workshop on development of wooden bridge construction in Latin America and Caribbean, Washington, D.C., 17-21 November 1986
Interregional	IDF*	1983-1986	Technical course on criteria for the selection of woodwoking machines
	IDF	1983-1986	Workshop on production management in public sector mechanical wood-processing industries, Yugoslavia, 10-27 April 1985
	IDF	1986—	Demonstration timber bridge, Austria
	IDF	1986—	Workshop on production management in public sector mechanical wood-processing industnes, Yugoslavia, 6-23 October 1986
	IDF	1986—	Workshop on production in public-sector mechanical wood-processing industries

For footnotes *a*, *b* and *c* see table 46.

[d]Economic Commission for Africa.

will treble. These forecasts demonstrate the importance of this industry and the need to ensure that it can obtain adequate supplies of wood from each country's forest resources.

Since most of the wood consumed in developing countries is still used for fuel, adequate resources for a substantial expansion of the wood and wood products industry now depend on reforestation. International co-operation in this industry is likely to focus in the next 15 years on programmes of reforestation, projects to develop the lumber industry and the raising of capacity utilization in existing plants producing sawn wood, veneers and plywood for export.

An example of the potential in Africa is the case of Ghana which shipped only 100,000 cubic metres of hardwoods in the early 1980s. Exports trebled in 1986 following substantial World Bank and bilateral development assistance. By 1990, exports are expected to rise to 700,000 cubic metres. There are now around 52 companies in Ghana exporting timber, although only 17 of these account for 85 per cent of total exports. Log exports still account for about half of Ghana's timber exports, but sawn lumber is increasing its share. In 1987 some 40 mills are expected to receive World Bank aid to start up with new equipment. Ghana is also keen to export furniture components and blanks but will have to pay close attention to quality and moisture content standards.

In 1986 the International Tropical Timber Agreement was signed by almost 100 producing and consuming nations. The corner-stone of the Agreement is the preservation and regeneration of the world's tropical hardwood reserves, which tend to be concentrated in the developing countries of South-East Asia, West Africa and Latin America.

Technological advances over the last 20 years have mainly focused on automation of wood processing and full utilization of waste products in panels such as fibreboard and particle board. More attention is now being given to using wood as structures in building.* In least developed countries and other developing countries lacking their own steel mills, opportunities for substituting wood for steel in construction projects are being encouraged by UNIDO.

Production of panel products from sawmill waste has been fully exploited in most developed countries, but remains to be exploited in developing countries. International co-operation could focus on the wider introduction of plants manufacturing fibreboard, particle board, hardboard etc.

Developing countries that manufacture veneers and plywood can benefit from advanced technology such as electronic scanners and sensors combined with computerized controls to upgrade the quality and value of their wood products, in particular those destined for export markets.

(c) *UNIDO activities*

UNIDO technical co-operation encourages the use of wood in construction in developing countries, most of which would otherwise have to import substitutes such as steel. UNIDO designs for prefabricated modular wooden bridges that were developed in Kenya have been introduced in seven other countries: Bolivia, Central African Republic, Chile, Dominica, Honduras, Madagascar, Nicaragua and Peru, and projects are operational in Bhutan and El Salvador. UNIDO has also assisted countries to preserve wood for the construction industry (Bhutan, Honduras and Nicaragua) and to introduce solar wood-drying kilns (Guyana and Montserrat). Training programmes are concentrated on criteria for the selection of woodworking machines and production management in wood-processing industries (see table 58).

UNIDO's first world-wide study of the wood and wood-processing industry [97] was prepared in 1983 and discussed at the first UNIDO Consultation Meeting on this industry convened at Helsinki in September 1983. The Consultation Meeting considered the management of forest resources needed for adequate world-wide supply of wood up to the year 2000, how to promote greater use of commercially less-accepted species of wood, and other measures to increase the share of developing countries in the international market for wood and wood products. When considering the current status and future development of the industry, the need to promote greater use of wood in construction in developing countries was recognized.

The UNIDO Investment Promotion Service has promoted investments in timber logging in Cameroon ($3.5 million) and in the manufacture of parquet-flooring blocks in the United Republic of Tanzania ($6.5 million).

9. *Furniture and fixtures (ISIC 332)*

Household, office, professional and restaurant furniture, and fixtures except those made of metal and moulded plastics

Upholstered furniture

(a) *Present situation*

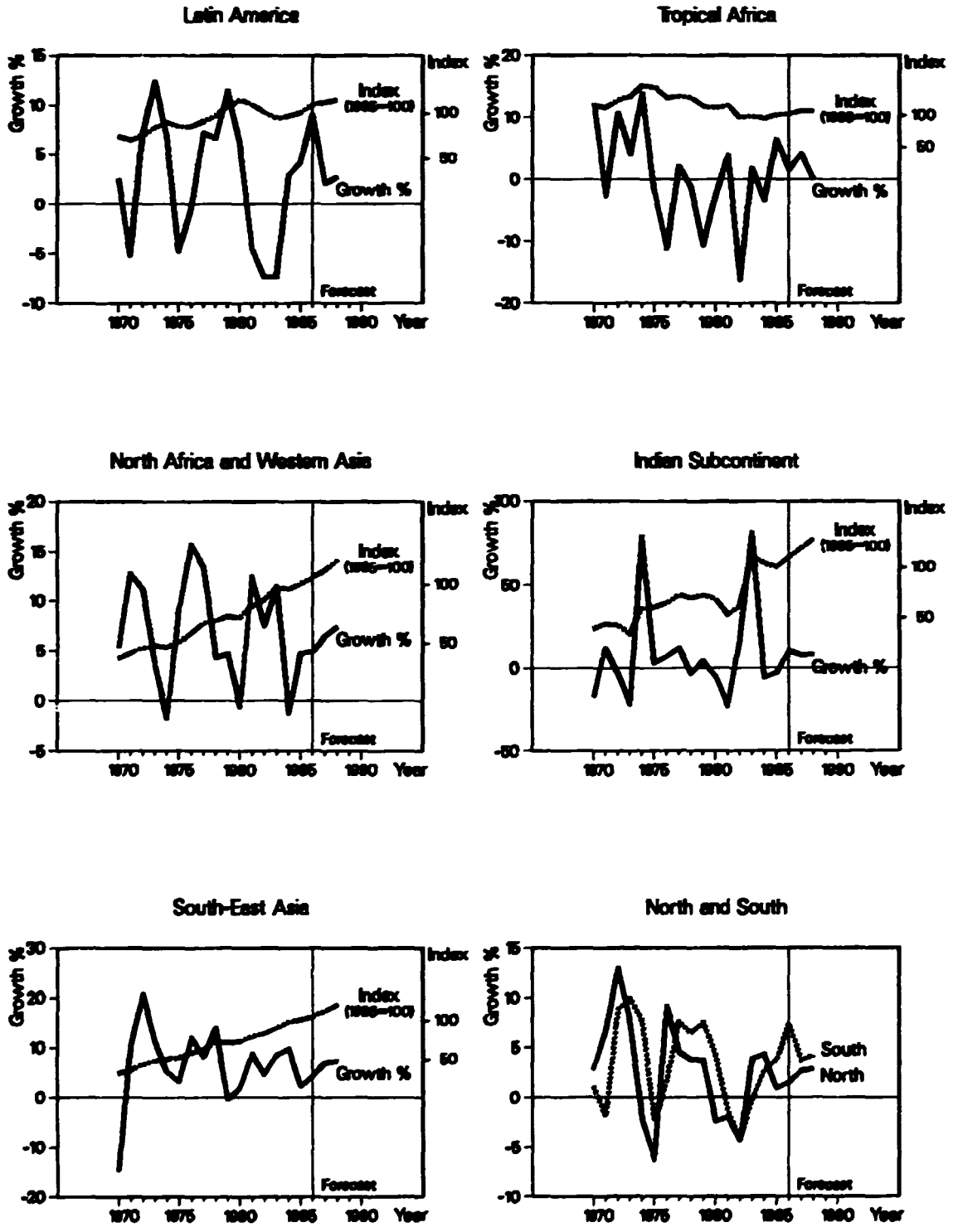
The furniture industry contributes 1 per cent of manufacturing output in developing countries and 1.8 per cent in developed countries. Between 1970 and 1985, output grew at 3.3 per cent per annum in developing countries and 1.8 per cent per annum in developed countries. As a result, the developing countries' share of world output increased from 6.8 per cent in 1970 to 7.4 per cent in 1985 on the basis of a sample of 82 countries, or from 7.7 to 8.2 per cent on the basis of data from 165 countries (see figure XXVII for regional trends).

Demand for furniture is cyclical because purchases tend to be postponed during recession and periods of high real interest rates. Furniture output declined between 1980 and 1982 in the United States and in Western Europe but recovered in the period 1984-1986. In the USSR and Eastern Europe, output of furniture has grown faster and more steadily (6.3 per cent in 1984 and 5.6 per cent in 1985).

Furniture, because it is bulky and heavy, has not been traded internationally to a great extent. The

*In Australia, for example, a way to utilize pine thinnings and small trees to produce strong structural-quality timber out of small-diameter logs has been developed in a pilot plant.

Figure XXVII. Furniture and fixtures (ISIC 332)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SIVGLD.

main exception to this rule is the United States, where furniture imports increased by 40 per cent in 1984, 32 per cent in 1985, and an estimated 20 per cent in 1986 to a level of $3 billion compared to domestic sales of $17 billion in 1986. The number of furniture manufacturers has fallen by 500. Many small and medium-sized companies have closed down and 20,000 employees have lost their jobs. A further concentration of the structure of the industry is expected because only large producers can afford to invest in modern state-of-the-art machinery and equipment.

Import competition has been less successful in Western Europe because the furniture industry has been quicker to adopt mass production methods and the plant layout this requires. European factories make more use of wood panels and veneers. The European method of flatline production requires less labour and produces furniture that can be shipped and assembled easily. The rectilinear design used is most suitable for bedroom furniture, dining-room tables and kitchen cabinets.

The performance of the furniture industry in developing countries showed different patterns in the period 1980-1985. Output fell by 20 per cent in Latin America and this region's contribution to the South's output declined from 70 to 60 per cent. Output also fell in Tropical Africa, and in 1985 it was still 4 per cent below the 1980 level. In the period 1980-1985, output increased in North Africa by 60 per cent, in Western Asia by 30 per cent, and in both the Indian Subcontinent and East and South-East Asia regions by 40 per cent.

Taiwan Province has been the most successful exporter, supplying 75 per cent of its total furniture output to foreign markets. Its furniture exports were worth $440 million in 1982, $605 million in 1983 and $547 million in 1984. Most of the furniture exported is shipped in ready-to-assemble form; items include bedroom and dining-room furniture and occasional pieces such as tables. Low labour costs are a factor ($1.57 per hour in Taiwan Province versus $5.60 per hour in the United States in 1982-1984). More important has been the construction of modern furniture factories using continuous line operations and state-of-the art machinery and equipment such as computer-controlled and electrostatic finishing equipment. The number of factories making furniture rose from 1,400 in 1978 to 2,500 in 1985 [98].

Singapore exports ready-to-assemble furniture to Australia, Canada, the Federal Republic of Germany, United States and the Middle East. The number of firms has grown from 23 to 35 and employment to 4,500. Exports of ready-to-assemble furniture were worth $24 million in 1977 and $48 million in 1983. Singapore is primarily an exporter of timber and other wood products, with total exports in all categories reaching $482 million in 1983.

Both Taiwan Province and Singapore face difficulties in obtaining adequate supplies of wood. The further development of solid wood furniture production in South-East Asia is likely to be concentrated in Indonesia, Malaysia and Thailand, where greater use of local woods is actively encouraged. Furniture manufacturers from Taiwan Province and Singapore are starting production of components and finished furniture in those countries.

In Latin America the furniture industry has developed for the large domestic market. Over the last five years, Brazil has developed sizeable furniture exports to the United States.

(b) *Future prospects*

The output of the furniture industry in developing countries is expected to increase by 3.7 per cent in 1987 and 4.1 per cent in 1988. Output in developed countries is expected to increase by 3 per cent in 1987 and 3.2 per cent in 1988.

Among developing regions, output growth is expected to be 2.1 per cent in 1987 and 2.7 per cent in 1988. Faster growth is forecast in three other regions: 6.8 per cent in 1987 and 7.1 per cent in 1988 in South-East Asia; 7.7 per cent and 9.2 per cent in North Africa and 5 per cent and 5.6 per cent in Western Asia; and 7.4 per cent and 7.5 per cent in the Indian Subcontinent. A cyclical upswing with growth of 4.6 per cent in 1987 and 0.7 per cent in 1988 is forecast for this industry in Tropical Africa.

Demand for furniture will continue to grow steadily in developing countries at a rate of about 4 per cent a year, the pace at which the urban population is increasing. Demand will continue to be cyclical, requiring manufacturers to have strong financial resources to carry them over long periods of weak demand.

Developing countries with adequate wood resources will emphasize solid wood furniture. They will also follow the trend in developed countries and make greater use of panel products made from sawmill waste. In developing countries demand for panel products is expected to treble between 1985 and 2000. Hence, production of rectilinear furniture using these panels is likely to be the fastest-growing side of the furniture industry over the next 15 years in many developing countries.

The volume of exports of solid wood furniture, furniture in ready-to-assemble form and furniture components from developing to developed countries can be expected to grow in the future. High transport costs can be overcome. Kitchen cabinets are already exported from Asia to Western Europe, and oak is exported from the United States to Asia for manufacture into furniture or furniture components and then shipped back to the United States.

Furniture manufacturing has always been a labour-intensive business, but in the longer term, a fully automated furniture manufacturing plant is the goal of many producers in developed countries. A number of furniture plants are currently using computer-controlled equipment for various operations in machining wood and some are looking at robot sprayers to apply finish coatings. But the major productivity improvements have been producing and assembling rectilinear furniture from coated panel boards.

The furniture industry in the North faces high costs in improving the factory environment. Dust is a major hazard and requires careful control. Some of the conventional finishing materials being used today, such as stains, glazes and lacquers, may be modified or replaced with other types of materials as government restrictions on emissions are more vigorously enforced.

Table 59. Selected UNIDO technical co-operation projects related to the furniture industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
China	UNDP	1985—	Assistance to the furniture industry
Democratic People's Republic of Korea	UNDP	1986—	Assistance to the furniture industry
Dominica	UNDP	1986—	Assistance to the furniture industry
Ecuador	UNDP	1985—	Assistance to "Artepratico" furniture factory
Ghana	UNDP	1986—	Technical assistance to Kumasi Furniture and Joinery Ltd.
Lao People's Democratic Republic	UNDP*	1981—	Pilot furniture plant
Marshall Islands	UNDP	1986—	Assistance to Anil Development Co. Furniture Production Factory
Tonga	UNDP	1986—	Assistance to the furniture and joinery industry
Caribbean	IDF	1986—	Development of integrated industry programme for the woodworking and furniture industries
Interregional	IDF	1983—	1984 seminar on furniture and joinery industries, Mauritius, 6-24 August 1984
	IDF	1985—	In-depth evaluation of seminars on furniture and joinery industries

For footnotes see table 46.

The long-term prospect in developed countries is that more large-scale automated furniture plants will be established, while at the same time, small-scale producers of high quality furniture will continue to find a market for their output. The introduction of serial production will be the major focus in developing countries, with some automation in plants oriented to export markets.

(c) *UNIDO activities*

UNIDO assistance to the furniture industry has mainly taken the form of seminars on the furniture and joinery industries. An evaluation report made in 1986 found that these seminars had served their purpose of informing owners, managers and staff of furniture enterprises in developing countries of modern practice as regards organizing production and selecting machinery and materials.

In 1986 UNIDO provided direct assistance to developing countries through the projects listed in table 59. UNIDO supports the modernization of furniture and joinery production by introducing rational designs, serial production planning and control and awareness of the need for quality.

*10. Paper and paper products (ISIC 341)**

Pulp, paper and paperboard

Containers and boxes of paper and paperboard

(a) *Present situation*

The paper and paperboard industry makes a growing contribution to total manufacturing output as income levels rise. In developed countries the contribution has been just under 3 per cent for the last ten years. In 1986, it was 3.1 per cent in Latin America, 2 per cent in North Africa, 2.4 in Western Asia, 2.2 per cent in the Indian Subcontinent, 1.5 per cent in South-East Asia and 1.6 per cent in Tropical Africa (see figure XXVIII for regional trends).

Between 1970 and 1985, value added in this industry increased twice as fast in developing countries as in developed countries (5.1 per cent versus 2.5 per cent per annum). As a result, the share of developing countries in world output rose from 7 per cent in 1970 to 9.9 per cent in 1985 on the basis of a sample of 82 countries, or from 7.9 to 10.8 per cent on the basis of data from 165 countries.

The volume of paper and paperboard products in North America and Western Europe was lower in 1985 than in 1984, but 1986 brought a recovery with output up 5.2 per cent in the United States, up 6.9 per cent in Canada and up 2.7 per cent in eight major producing countries in Western Europe. In Japan, output increased by 5.8 per cent in 1985 and 2 per cent in 1986 [99].

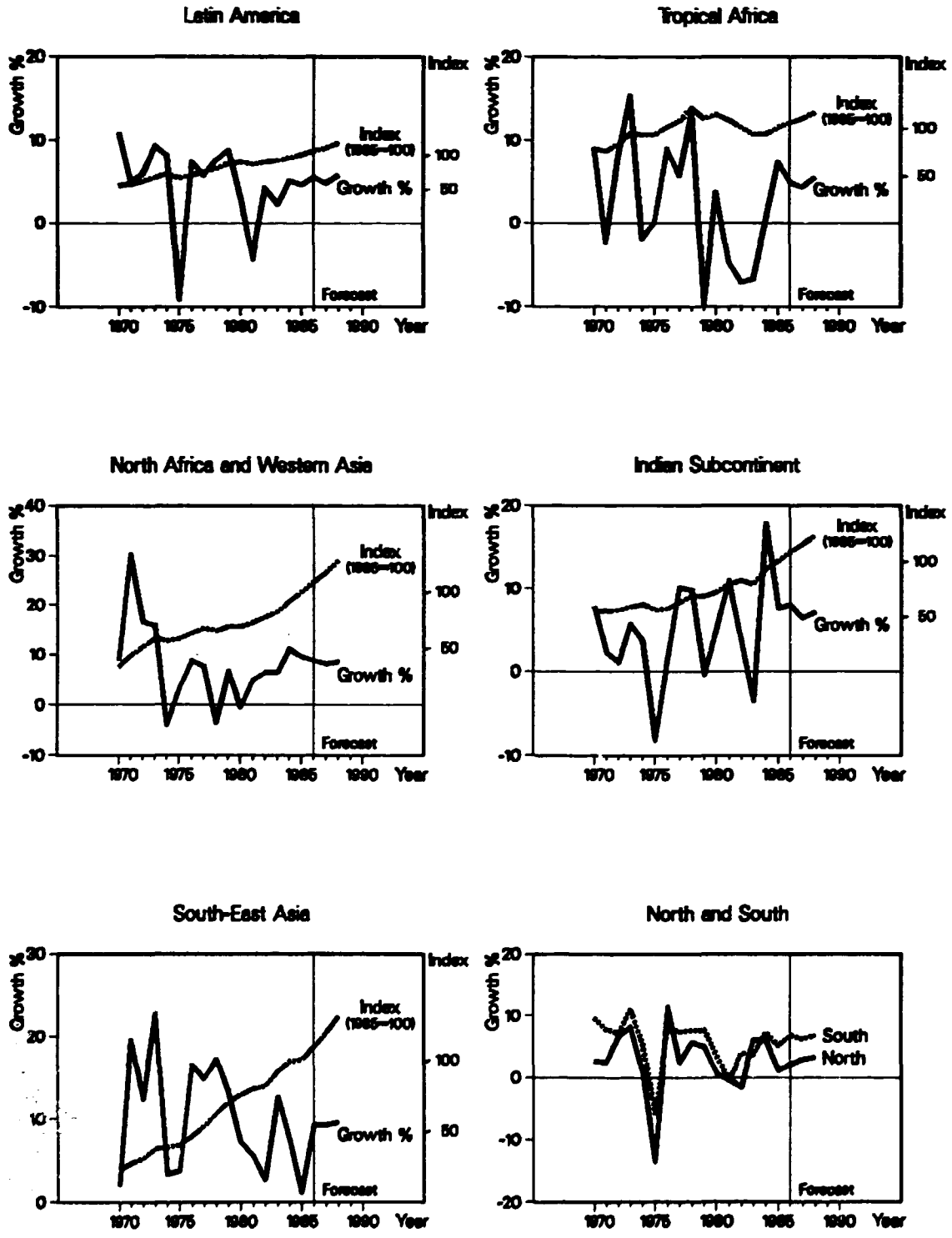
The weaker dollar and improved demand in North America in 1986 brought a firming of prices from the depressed level of 1985. The United States and Canadian industries became more competitive in international markets and Scandinavian producers lost some of their market share. Further gains by North American producers are expected in 1987.

In Japan, plans by the Ministry for International Trade and Industry in late 1984 to cut paper capacity by 10 per cent by September 1986 and paperboard capacity by 20 per cent by June 1987 were abandoned and expansion plans resumed. Japan remains short of wood-fibre resources, and Japanese firms have bought out existing pulp and paper producers on the west coast of the United States and Canada.

Consumption of paper and paperboard in the USSR and Eastern Europe increased by 2 per cent in 1985. The USSR is a major exporter of round wood for pulp-making in Europe and Japan. Exports of pulp (800,000 tonnes) and paper (1 million tonnes) are also significant, the major share, about 75 per cent, being purchased by countries in Eastern Europe. The

*UNIDO acknowledges the contribution made by Peter Sutton, Editor of *Pulp and Paper International* (Brussels).

Figure XXVIII. Paper and paper products (ISIC 341)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

growth of the industry in the USSR is constrained by the depletion of softwood resources in the western part of the country. Development plans for the industry emphasize greater use of low-quality wood and waste paper and the modernization of manufacturing processes including automatic controls.

China's output of paper and paperboard has grown rapidly, increasing by 21 per cent in 1985. China aims at increasing output by 100 per cent by the year 2000. Per capita consumption of its population of 1 billion is low, only 7-8 kilograms per head. Small integrated production units predominate. The development plan for the industry includes modernization of existing units and the installation of larger plants. Despite a high level of recycling, China is short of fibrous raw materials and depends greatly on non-wood fibres and waste paper. China has invested in a Canadian pulp mill and is reported to be interested in co-operation with Chile.

Paper and paperooard output continued to expand in developing countries in 1985 and 1986, growing most rapidly in Asia. In the Republic of Korea output was up 14 per cent in 1986; a further 8 per cent rise is forecast for 1987. Exports doubled in 1986 to 200,000 tonnes and investment is planned mainly to expand production of kraft linerboard. The industry has been protected by high import tariffs, but these are now being reduced.

In Taiwan Province, output in 1986 was up 25 per cent and exports were up 60 per cent at 150,000 tonnes. New paper machines coming on stream, and higher output from existing production lines, were not required to meet rising demand. Some mills that faced financial problems a few years earlier were brought back into production. The paper industry seems almost unaffected by the gradual lowering of import tariffs, but the supply of raw materials may be a limiting factor to further development of the industry.

Brazil, which has already established itself as one of the world's leading pulp suppliers, is gearing up for another major round of expansion. If four major projects go ahead, the country's pulp production capacity could more than double by 1994. Brazil is also moving slowly towards more integration by expanding its paper production. In 1986 paper consumption rose sharply and exports jumped 38 per cent. Backed by new education programmes, domestic demand is projected to continue to grow at about 8 per cent a year, provided the current interruption to rapid economic growth is overcome. In Mexico, paper production fell 2 per cent in 1986, but a 4 per cent increase is anticipated in 1987 as the economy recovers and new capacity comes on stream.

Chile is at an earlier stage of development in the paper industry than Brazil but should become a major pulp-producing country in the next few years, with substantially increased pulp exports. There are three big pulp mill projects possible in which foreign partners may become involved. China, Japan and New Zealand are likely candidates for the foreign investment.

In Indonesia, the paper industry has been expanding more rapidly. Output in 1985 was nearly 500,000 tonnes, a tenfold increase from 1975, while imports have been kept at about the same level of 250,000 tonnes. Many small, new paper mills have started up, as well as some bigger ones, and there are several new pulp mills likely to go ahead before 1990.

Paper output in the Philippines in 1985 was about 220,000 tonnes, around half of the paper industry's capacity, and at virtually the same level as ten years earlier. The Government has introduced a protectionist policy that results in imports being used mostly to make containers for export products. As a result, there should be a gradual increase in domestic paper production in 1987. In Malaysia, the new Sabah integrated paper/printing mill is scheduled to come on stream in 1987.

India's pulp and paper industry suffers from lack of raw materials, expensive and often erratic energy supply, and the small size of most of the country's approximately 250 mills. But despite these problems, the industry has made good progress in the last 10 years, with output rising gradually. Production in 1985 was about 1.6 million tonnes, about 65 per cent of installed capacity. The outlook is favourable, with new newsprint capacity due to start up in 1987 and import duties on pulp and paper being reduced, and additional forestry plantations planned in the longer term.

In Western Asia, there will be a new addition to the list of paper-making countries when a 40,000 tonnes per year waste-based paperboard mill starts up in the United Arab Emirates later in 1987.

In Tropical Africa, the Congo is discussing a possible pulp mill to make use of the large eucalyptus plantations it has been growing. Nigeria's paper output should expand in 1987. After long delays, two new paper mills started up, but immediately faced considerable difficulties in obtaining the foreign currency needed to import essential chemicals, raw materials and spare parts necessary to make the paper which would, in turn, replace imported paper. These difficulties were overcome when the currency was devalued at the end of 1986, but the imports then became very expensive.

Despite the increased output in major producing countries, imports from the main northern suppliers probably increased in 1986. Over 50 developing countries do not yet have a local paper industry and their imports have increased to meet growing local demand.

(b) *Future prospects*

In developing countries, the outlook is for the output of paper and paper products to increase by 6.2 per cent in 1987 and 6.9 per cent in 1988. In developed countries, the outlook is for the output of paper products to increase by 3 per cent in 1987 and 3.5 per cent in 1988.

Among developing regions, output is expected to grow fast in the Indian Subcontinent (6.4 per cent in 1987 and 7.1 per cent in 1988) in East and South-East Asia (9.3 per cent in 1987 and 9.6 per cent in 1988) and in Western Asia (8.7 per cent in 1987 and 8.5 per cent in 1988). In North Africa, output increases of 6.8 per cent in 1987 and 7.9 per cent in 1988 are expected as greater use is made of newly installed capacity. Growth at a slower pace is forecast for Latin America (4.8 per cent in 1987 and 5.7 per cent in 1988) and Tropical Africa (4.5 per cent in 1987 and 5.5 per cent in 1988).

A higher level of prices was established in January 1987 for products such as market pulp, kraft linerboard, newsprint and the main grades of printing paper. However, developing countries will benefit from keen competition to export paper as the world continues to have a good margin of excess capacity.

A recent survey of the industry's world-wide investment intentions reveals plans to add 7 per cent to the 1985 world capacity by 1990 [100]. Producers in Western Europe and North America each expect to add 5 million tonnes per year of new capacity by 1990. Producers in Japan are expected to add 0.5 million tonnes and in South Africa 0.15 million tonnes. The planned expansion of capacity in developing countries is greatest in Asia (2 million tonnes) and in Latin America (0.9 million tons), but less in Africa (0.1 million tonnes).

Both this survey and a recent FAO study suggest that developing countries are not yet planning to build sufficient capacity to meet their growing demand for paper and paperboard. FAO forecasts to 1995 suggest that the gap will be filled by substantially increased exports from Western Europe and North America (see table 60). But rather than allow this situation to arise, developing countries may plan to expand output more rapidly and reduce the huge threefold increase in their level of imports that FAO forecasts between 1984 and 1995.

The raw material, infrastructure and human resources exist in the South to expand production of pulp, paper and paperboard more rapidly than planned at present. The paper and paperboard industry requires considerable resources of wood and waste paper, adequate supplies of water, ample supplies of energy, and excellent transport and bulk-handling facilities. The technology of this capital-intensive industry is widely available and production techniques have been mastered by many developing countries. But constraints on increasing supply are presented by shortages of wood resources and difficulties in financing new plants. These must be overcome if developing countries are to avoid becoming much more dependent on imports over the next 10 years.

Three major trends in technology may help developing countries achieve their goals. The first is the growing use of hardwood and other materials as a source of fibre for pulp. Straw-pulping technology has been developed in China, Egypt and Italy. An improved process based on chlorine and sulphur which would considerably reduce both the capital cost and the environmental problems now seems a real possibility. Another opportunity is provided by the use of a mechanical process to make pulp from bagasse. In India, pulp made from bagasse is being used to make newsprint.

The second major trend is the construction of small, simple paper machines that can use waste paper to manufacture tissues and paperboard. This way of making paperboard is likely to spread in developing countries.

The third is the modernization and rebuilding of existing machinery, rather than investing heavily in new mills, or new paper equipment. New developments in equipment design include sophisticated computer process control systems, twin-wire units and wide-nip press sections that can be added to existing paper machines. Multi-layer units that allow a cheaper raw material to be used in the middle layer of a paper sheet are also becoming more popular. Continuing to make a better energy equation is another part of the modernization process, for example by investing in fluidized bed boilers.

(c) *UNIDO activities*

The main focus of UNIDO technical co-operation activities is on assisting developing countries in the use of local raw material other than wood (bagasse, bamboo), in selecting the pulping process most suitable for these raw materials and in rehabilitating or modernizing existing pulp and paper works. UNIDO assistance has strengthened national centres for pulp and paper research in Burma, China, Cuba and Sudan. Seminars to compare alternative pulping processes have been

Table 60. Projections of world supply of and demand for paper and paperboard, 1984, 1990 and 1995

(Millions of metric tonnes)

	Supply			*Demand*		
Region	*1984*	*1990*	*1995*	*1984*	*1990*	*1995*
North America	76.5	83.5	93.2	73.4	76.1	82.6
Western Europe	49.9	56.3	66.1	46.7	50.6	58.9
Oceania	2.1	2.4	2.9	2.5	2.8	3.2
Others	21.4	27.2	34.0	21.6	26.5	32.2
Eastern Europe and USSR	15.0	18.5	22.5	15.2	19.7	24.4
Subtotal	164.9	187.9	218.7	159.4	175.7	201.3
Centrally planned Asia	7.0	10.5	13.7	7.5	12.1	16.2
Latin America	8.6	10.0	12.5	9.7	13.3	17.0
East Asia	5.5	5.8	7.8	7.7	10.9	15.2
North Africa and Western Asia	0.7	0.8	1.1	1.7	2.4	3.1
Africa	0.3	0.4	0.5	0.8	1.1	1.4
Subtotal	15.1	17.0	21.9	19.9	27.7	36.7

Source: Food and Agriculture Organization of the United Nations [100].

Table 61. Selected UNIDO technical co-operation projects related to the paper and paper products industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Burma	UNDP**	1977—	Establishment of a pilot plant for pulp and paper research and training on tropical raw materials at the Central Research Organization
	UNDP	1985—	Lignin utilization from pulpmill blank liquors
China	UNDP*	1981-1986	Technical centre of pulp and paper-making technology
Cuba	COFN	1982-1986	Centro de investigaciones del bagazo
India	IDF*	1979—	Desilification plant for Ashok Paper Mills Ltd.
	UNDP*	1985—	Chemical recovery for small pulp mills using non-woody materials
Iran (Islamic Republic of)	UNDP	1985-1986	Appraisal study on the Choka Mill and concept study on the Mazandaran Pulp/Paper Mill
Portugal	UNDP	1985-1986	Restructuring the Companhia de papel do prado
Sudan	UNDP/OTF	1982-1986	Cellulose Chemistry and Technology Research Unit
Turkey	UNDP*	1981—	Seka pulp and paper
Uganda	UNDP	1981-1986	Assistance in pulp and paper production—Pulp and Paper Company
Viet Nam	UNDP**	1981-1986	Rehabilitation and modernization of pulp and paper mills
Yugoslavia	UNDP*	1985—	Assistance to the SOUR UNICEP pulp and paper complex
	UNDP	1986—	High-level advisory assistance for pulp, paper and packaging material production for the factory Stanoje Aksic
Africa	IDF	1984—	Seminar on comparative pulping processes including the monopulp process, Alexandria, Egypt, 26-30 April 1986
Asia and the Pacific	IDF	1984-1986	Seminar on comparative pulping processes including the monopulp process, Bangkok, 2-6 December 1985
Global	IDF	1979-1986	Pilot plant for long/short fibre separation in bamboo pulp at Ashok Paper Mills Ltd.

For footnotes see table 46.

organized for Asian and African countries. Process improvements have been introduced at plants in India, Portugal, Turkey, Uganda, Viet Nam and Yugoslavia (see table 61). UNIDO has also supported the development of a process to separate long and short fibres in bamboo pulp in a pilot plant in India that could be used by other developing countries.

11. Printing and publishing (ISIC 342)

Book publishing
Newspaper and periodical publishing
General printing and publishing
Stationery

(a) *Present situation*

The printing and publishing industry contributes 2.5 per cent of manufacturing output in the South and 3.7 per cent in the North. The contribution in 1985 was greatest at 3.6 per cent in Tropical Africa and 2.8 per cent in Latin America (see figure XXIX for regional trends).

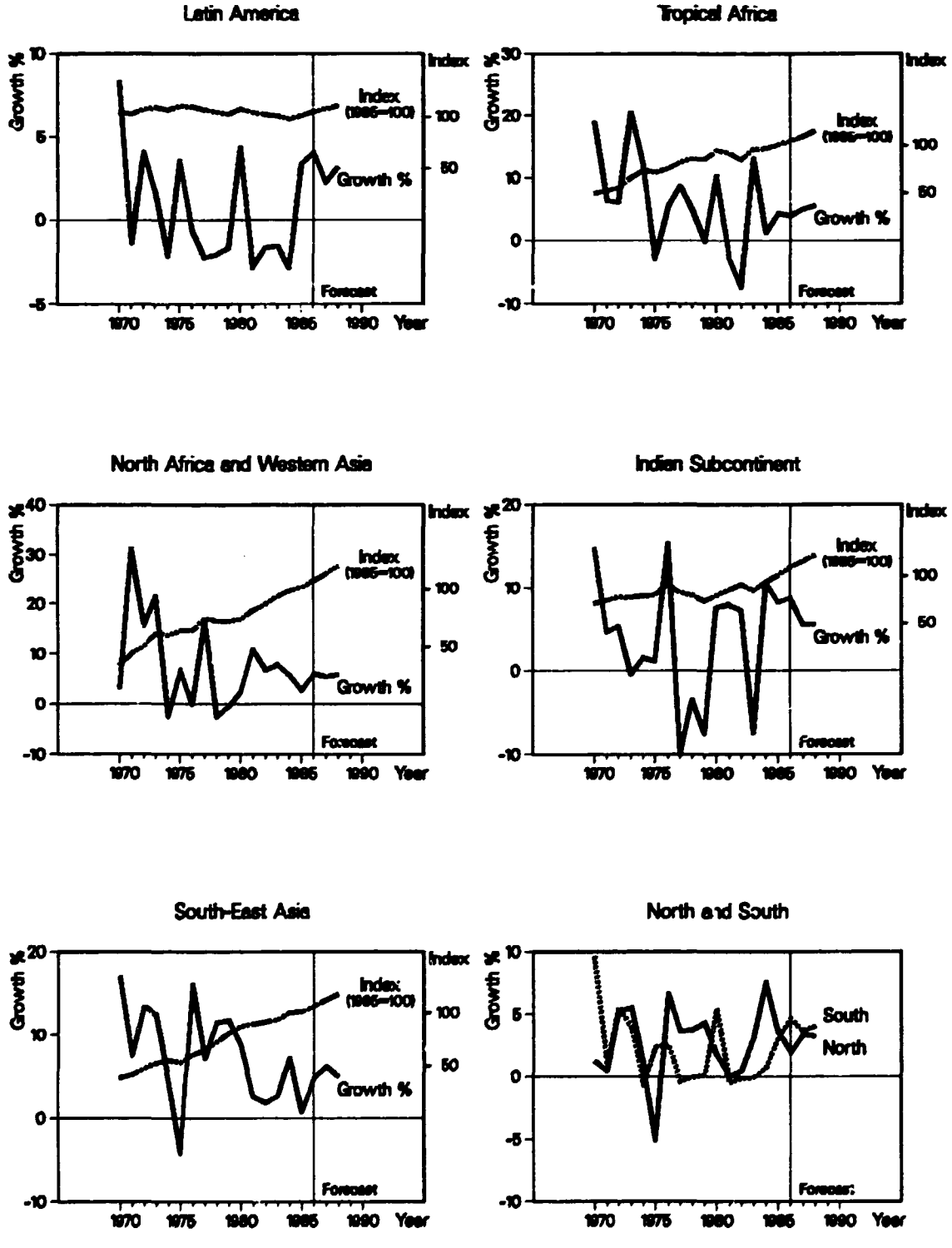
In the period 1970 to 1985, the printing and publishing industry grew faster in developed than in developing countries (2.7 versus 1.6 per cent per annum). As a result the share of developing countries in world output fell from 8.6 to 7.4 per cent on the basis of a sample of 82 countries, or from 9.7 to 8 per cent on the basis of data from 165 countries. This trend is expected to be reversed in the future.

In developed countries, the main categories of output are general printing and publishing including books (60 per cent), newspapers and periodicals (30 per cent) and stationery (10 per cent). In developing countries, newspapers and periodicals make a higher contribution to the industry's output.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) collects world-wide statistics on book production (number of titles), the circulation of general-interest newspapers and periodicals and the consumption of other printing and writing paper. The estimated circulation of daily newspapers in the world was 500 million in 1984, of which 118 million or 23.5 per cent were in developing countries. Between 1975 and 1984, newspaper circulation doubled in Arab countries and increased by 50 per cent in Africa, 33 per cent in Latin America and the Caribbean and 15 per cent in Asia, including Japan. The number of daily newspapers circulated per 1,000 inhabitants was lowest in Africa (10). In Arab countries the average was 35, 54 for Asia and 80 for Latin America.

The largest consumers of newsprint among developing countries are shown in table 62. The growth of

Figure XXIX. Printing and publishing (ISIC 342)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

Table 62. Consumption of newsprint in 16 developing countries and areas, 1975 and 1983

(Millions of metric tonnes)

Country or area	1975	1983
India	152.8	401.0
Brazil	240.7	263.0
Republic of Korea	150.6	231.0
Mexico	214.6	224.0
Argentina	148.8	186.8
Venezuela	85.6	166.7
Turkey	98.2	151.2
Thailand	63.4	131.6
Indonesia	46.7	110.8
Egypt	40.2	99.7
Malaysia	34.1	95.0
Hong Kong	53.3	89.1
Singapore	30.3	78.3
Colombia	44.4	77.9
Philippines	68.7	71.2
Nigeria	23.7	20.0
Total	1 496.1	2 397.3

Source: UNESCO [101].

consumption has varied greatly from country to country, more than doubling in some and not increasing at all in others. The average increase in the 16 countries or areas listed in table 62 for the period from 1975 to 1983 was 60 per cent or 6.1 per cent per annum.

The USSR published the largest number of book titles in 1983, followed by other major developed countries. China and the Republic of Korea each published more than 30,000 titles; Brazil published more than 19,000. Information is available on only a few other developing countries and areas; the largest publishers are shown in table 63. The output of Hong Kong may include titles printed and published elsewhere.

Paperback books have been the most significant development in book publishing in the last 30 years. About 40 per cent or 19,000 of the 50,000 book titles published in the United States each year are published in paperback form. The mass market paperback business accounts for 20 per cent of all paperbacks published, that is about 3,800 titles [102]. Fiction accounts for 2,500 of these 3,800 titles. In 1985 the average price of mass-market paperbacks was $3.50 and specialized paperbacks $24.00, compared to higher-volume hardback books at $26.60 and all hardback books at $31.46.

The market for book publishers is a global one, but copyright laws and agreements divide up the world into territories that can be served from each national production centre. World trade is more liberal in science books and magazines. The Netherlands and the United States are the largest publishers, each with book exports worth $200 million. For the Netherlands, this is 20 per cent of their publishing output, and exports are growing by 10 to 15 per cent per year [103].

Production of school textbooks is a vital and dynamic part of the publishing industry. Data are reported to UNESCO by 68 countries and areas, among them only a few developing countries. China appears to be by far the largest producer, followed by the USSR and Japan (see table 64). Data for France, Germany, Federal Republic of, United Kingdom and the United States are not available.

Table 63. Number of book titles published in selected countries and areas in 1983

Country or area	Number of titles
USSR	82 589
Germany, Federal Republic of	58 489
United States	53 380
United Kingdom	50 981
Japan[a]	42 977
France	37 576
Republic of Korea	35 512
China	31 602
Brazil[a]	19 179
Colombia[b]	7 671
Turkey	6 869
Hong Kong	5 681
Indonesia	5 731
Thailand	6 819
Argentina	4 216

Source: UNESCO [101].

[a] 1982.

[b] 1981.

Table 64. Production of school textbooks in selected countries and areas, 1983 and 1984

Country or area	Year	Number of titles	Number of copies produced (millions)
China	1984	5 574	2 358.7
USSR	1984	2 836	293.1
Japan	1983	2 044	224.2
Republic of Korea	1984	3 867	47.7
Italy	1984	1 131	46.3
Spain	1984	2 836	44.9
Colombia	1984	2 570	25.8
Cuba	1984	866	22.6
Hong Kong	1983	1 149	20.3
Philippines	1984	185	14.6
Singapore	1983	425	4.3
Côte d'Ivoire	1983	...	3.5
United Arab Emirates	1983	63	1.5

Source: UNESCO [101].

(b) *Future prospects*

The output of the printing and publishing industry in developing countries is expected to increase by 3.7 per cent in 1987 and by 4.1 per cent in 1988. Output in developed countries is expected to increase by 3.4 per cent in both 1987 and 1988. Among the developing regions, output of the printing and publishing industry is expected to grow fastest in Asia. Output in the Indian Subcontinent is forecast to increase by 6.1 per cent in 1987 and 6.4 per cent in 1988; in South-East Asia output is forecast to increase by 5.7 per cent in 1987 and 5.2 per cent in 1988. Continued slow growth is predicted for Latin America (2.2 per cent in 1987 and 3.1 per cent in 1988). The outlook for North Africa is an output growth at 2.9 per cent in 1987 and 3.3 per cent in 1988, and in Western Asia at 6.5 per cent in both 1987 and 1988. For Tropical Africa, out-

Table 65. Shares of world population, book and newspaper production by region or economic grouping, 1975 and 1984

(Percentages)

Region or economic grouping	Share of world population		Share of world book production[a]		Share of world newspaper production[b]	
	1975	1984	1975	1984	1975	1984
North America	2.7	5.5	16.2	12.8	14.6	13.7
Europe (including USSR)	23.7	16.1	60.0	53.3	48.8	47.6
Oceania	0.7	0.5	1.6	1.5	1.6	1.2
Africa	9.9	8.7	1.5	1.3	1.3	1.8
Latin America and Caribbean	10.6	8.3	5.1	7.4	5.3	6.4
Asia[c]	42.8	57.1	15.1	22.7	28.1	29.1
Arab countries	4.6	3.8	0.9	0.9	0.7	1.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Developed countries	36.9	25.2	84.6	73.5	78.7	76.5
Developing countries	63.1	74.8	15.4	26.5	21.3	23.5

Source: UNESCO [101].

[a]By number of titles not volume.

[b]By average daily circulation not volume.

[c]Including centrally planned economies and Japan, excluding Arab countries.

put growth at 5.4 per cent in 1987 and 5.9 per cent in 1988 is expected.

UNESCO estimates that developing countries and China have increased their share of world book production (measured by number of titles) from 15 per cent in 1975 to 26 per cent in 1984. Bearing in mind that this group of countries have 75 per cent of the world's population, a further increase to 35 per cent by 1995 can be expected. The share of developing countries and China in world circulation of newspapers was 21.3 per cent in 1975 and 23.5 per cent in 1984. An increase of 26 to 30 per cent by 1995 can be expected (see table 65).

Printing and publishing in developing countries can benefit from the new technologies that have revolutionized the printing industry in developed countries over the last 10 years. The main advantages of the new electronic publishing systems are the speeding up of the editing process, greater accuracy and a much faster route to the printed publication. These features will be appreciated by publishers in developing countries as much as in developed countries. Electronic publishing has made its most dramatic advances in the field of magazine and journal publishing. The process of typesetting, composition and pagination are carried out with a computer; the resulting text is printed with a laser printer before being photo-typeset.

Book publishers have been slower to move over to this system.* In some firms, editing is carried out on the screen; spelling and readability checks, indexing and cross-referencing can already be made automatically on a word-processing computer. For less sophisticated publishing, computer software manufacturers have produced what they term a "desk-top publisher" for small personal computers.

The prospects for the printing and publishing industry are bright. The whole process of publishing can be much quicker, more efficient and cheaper to operate than in the past. Lower costs will help boost demand in developing countries and perhaps help the printing and publishing industry to grow much faster than the 2 per cent per annum of the past 20 years.

*Harper and Row have invested $2 million in a system. See Jerome P. Frank, "Computer-assisted book publishing system finds many dividends", *Publishers' Weekly*, 5 September 1986.

(c) *UNIDO activities*

UNIDO has no technical co-operation activities in the field of publishing and printing.

*12. Industrial chemicals (ISIC 351)**

Organic chemicals (mainly petrochemicals)
Choralkalies and other inorganic chemicals
Fertilizers and pesticides
Plastics
Synthetic fibres
Synthetic rubber

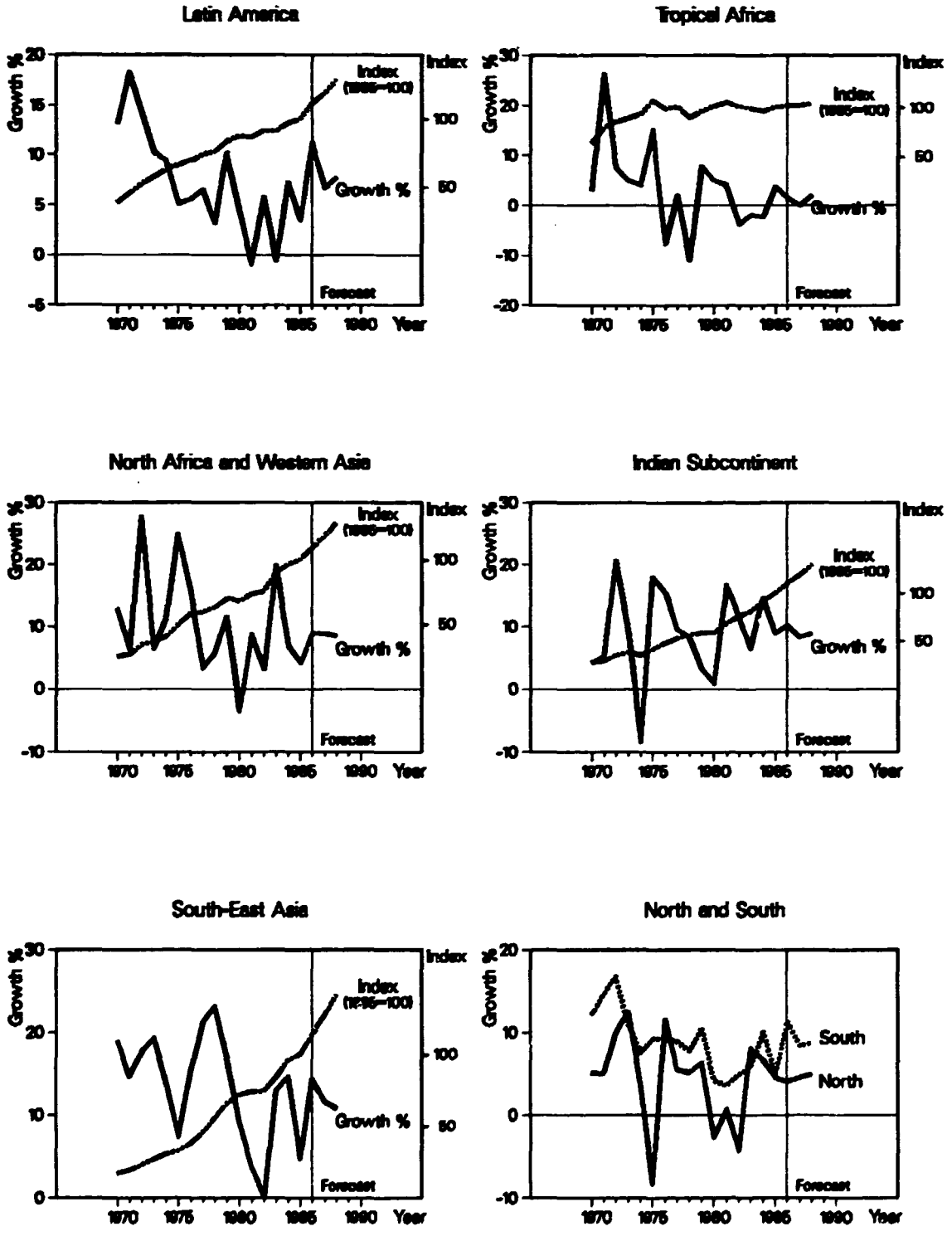
(a) *Present situation*

Industrial chemicals is one of the largest industries, contributing 4.9 per cent of total manufacturing output in 1985 in developed countries and 4.6 per cent in developing countries. Its contribution is highest, at 7.2 per cent, in the Indian Subcontinent, and lowest, at 1.6 per cent, in Tropical Africa (see figure XXX for regional trends).

The output of this industry grew twice as fast in developing countries as in developed countries between 1970 and 1985 (8.5 per cent versus 4.1 per cent). As a result, the share of developing countries in world output rose from 6.3 per cent in 1970 to 11 per cent in

*UNIDO acknowledges a contribution on this industry from Lyn Tattum, Editor of *European Chemical News* (London).

Figure XXX. Industrial chemicals (ISIC 351)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

1985 on the basis of a sample of 82 countries, or from 7.1 to 12.1 per cent on the basis of data from 165 countries.

Because this industry is at an early stage of development in most developing countries and areas, a small group of 10 of them account for 85-90 per cent of the South's output in this industry. Most of those countries and areas are in Asia and Latin America. Between 1980 and 1985, value added in this industry increased by 15 per cent in Latin America, 72 per cent in the Indian Subcontinent, 40 per cent in East and South-East Asia, 50 per cent in Western Asia and 33 per cent in North Africa, but by only 0.9 per cent in Tropical Africa

The petrochemical industry

In the period 1980-1985, the price of basic petrochemicals increased and demand weakened, leaving the industry in developed countries with considerable excess capacity. After a period of restructuring, rationalization and cost-cutting, lower energy costs brought a welcome substantial increase in profitability in 1986. Since very little new capacity was built during this period, the industry anticipates a much better balance in supply and demand by 1990 and possibly a shortage of capacity in some products.

In the developed countries, the improved economies of basic petrochemical production has not yet discouraged the major chemical companies from putting total emphasis on speciality products such as paints, pharmaceuticals, agrochemicals, engineering plastics, electronic chemicals, flavours and fragrances, cosmetics and other items. But there is a danger that some of these may become oversupplied.

The expansion plans in developing countries were not deterred by low world market prices and the excess capacity in the North. Their markets for plastics and man-made fibres were booming and basic petrochemical complexes were needed to supply them. However, in the period 1982-1985, high interest rates and strained foreign exchange resources led to the postponement of some new plant construction. In 1986, the earlier plans were taken off the drawing-board and revived. As a result, the major part of the expansion in world petrochemical capacity in the period 1987 to 1992 is likely to take place in developing countries. The major expected additions to world ethylene capacity in developing countries in this period are listed in table 66.

India made major steps in building up an indigenous petrochemical industry in the 10 years up to 1985 but has found that the current level of production is inadequate. The first large aromatic and ethylene complexes were set up at Baroda in the public sector. The Government now sees a need for several new ethylene and aromatic complexes that will treble output of ethylene and benzene before 1990 [104]. The output of the Indian chemical industry increased by 8 to 10 per cent in 1986. Expenditure on research and development is still low, at only 1 to 2 per cent, but tax incentives are designed to improve this. The industry is now exposed to import competition as the Government's more liberal trade policy has opened up the domestic market to international competition.

Table 66. Growth of ethylene capacity in developing countries and areas, 1980-1990

(Thousand of tonnes per year)

Country or area	1980	1984	1985	1987	1990
North America					
Algeria	120	120	120	120	120
Libyan Arab Jamahiriya	...	330	330	330	330
Western Asia					
Qatar	280	280	280	280	280
Saudi Arabia	...	...	1 611	1 611	1 611
Turkey	55	55	367	367	367
Indian Subcontinent					
India	214	241	253	253	840
South East Asia					
Republic of Korea	505	505	505	755	755
Singapore	...	300	300	300	300
Latin America					
Argentina	173	253	253	253	840
Brazil	802	1 381	1 381	1 381	1 500
Chile	45	45	45	45	60
Colombia	16	115	115	115	446
Mexico	435	932	940	940	1 840
Peru	5	5	2	5	255
Venezuela	150	150	150	150	150
Total	2 800	4 712	6 652	6 905	9 694

Source: "Current world situation in petrochemicals" (UNIDO/PC.126). 14 November 1985.

ASEAN countries are reviving plans that were shelved in the period 1982 to 1985. New ethylene complexes are planned by Thailand and Indonesia. Malaysia wants to use the huge offshore gas deposits. In East Asia, two additional complexes are being considered in the Republic of Korea and one new complex in Taiwan Province.

In Latin America, growing demand for petrochemicals in both Argentina and Brazil has inspired plans for investment in new production capacity. Brazil has sanctioned the construction of a new ethylene cracker based on offshore gas, to be built close to Rio de Janeiro. At two other locations in the north and the south of the country, petrochemical complexes are to be expanded. This is to meet the rapid growth in demand for chemical products which increased by 30 per cent in 1986, compared to 10 to 12 per cent in 1985. Import tariffs on certain products such as polyvinyl chloride have been lowered as an interim measure to help fill supply gaps.

The industrial chemicals industry has been expanding most rapidly in China. China plans to increase output of chemicals by 7.6 per cent per annum between 1985 and 1990. If the 22 per cent expansion of fertilizers is included, investment in chemical plants will exceed $5.4 billion [105]. For example, China's first world-scale 300,000 tonnes-per-year ethylene plant was completed in 1986 and three others of similar size are under construction. Two smaller ethylene complexes are also planned. These new plants will enable the country to increase ethylene output to 1,630,000 tonnes in 1990, up from 630,000 tonnes in 1983. After the period of consolidation following the 1978-1979 plant-ordering boom, a second wave of new construction and modernization in the chemical industry

began in 1983. In 1984 alone, 657 contracts to revamp existing plants (40 per cent with Japanese enterprises) were signed [106]. These figures are evidence of the tremendous importance attached by China to foreign co-operation in this industry.

The fertilizer industry

The fall in the price of oil and intense competition in export markets brought a decline of about 50 per cent in the price of nitrogenous fertilizers between the first quarter of 1985 and October 1986. Competition was particularly fierce in Western Europe, where Canada, Kuwait, Libyan Arab Jamahiriya, Trinidad and Tobago and the USSR all entered the urea market. Prices of potash declined by about 33 per cent and phosphate fertilizer prices by about 20 per cent. Despite the lower prices, some developing countries had difficulty financing a sufficient volume of fertilizer imports. Supplies were boosted by bilateral aid, loans for this purpose from the World Bank and regional development banks, and some barter and counter-trade arrangements. Prices have fallen to such low levels that some observers feel that insufficient new fertilizer capacity will be built to supply growing needs in developing countries in the early 1990s.

The price outlook for 1987 and 1988 is for fertilizer prices to recover very slowly. For nitrogen fertilizers there was a small increase in the first quarter of 1987. Demand for fertilizers in North America and Western Europe will continue below the peak level of 1984/1985 as subsidies are reduced and land is taken out of cultivation. But demand will continue to grow in developing countries and in the USSR and Eastern Europe. Overall, the world over-supply is expected to last until 1990 for nitrogen fertilizers and perhaps longer in the case of phosphates and potassium.

In the year ending June 1985, world production of fertilizers increased by 7 per cent or 11 million tonnes. The developed market economies contributed 4 million tonnes, developing countries (excluding China) 3 million tonnes, the USSR and Eastern Europe 2 million tonnes and China 2 million tonnes [107]. In the next five years little growth is expected in demand for fertilizers in most developed countries because support for farm prices is being reduced. The entire growth in world output will come in Eastern Europe and the USSR, where there is to be a strong emphasis on raising agricultural output, in China, where the industry is being modernized and expanded, and in other developing countries, where industries that support agriculture continue to be a top priority.

The USSR plans to increase fertilizer output during the period 1986-1990 to a level 27 per cent higher than that achieved during the period 1981-1985. Ammonia plants built in the 1970s will be modernized and expanded. More liquid fertilizers will be used. The deficiency of phosphate in soils will be tackled with the prospect of doubling harvest yields in some areas. New local phosphate deposit will be developed. The USSR output of phosphate fertilizer rose from 3.1 million tonnes of P_2O_5 in 1970 to 8.4 million tonnes of P_2O_5 in 1985, but still needs to increase further [108].

China is the world's largest consumer of nitrogen and third in terms of all fertilizer nutrients. Application of fertilizers increased from 5 kilograms per hectare in 1965 to almost 150 kilograms per hectare in 1985, treble the average rate for developing countries. To satisfy further increases in fertilizer use, China plans to expand fertilizer production by 22 per cent between 1985 and 1990, to 16.3 million tonnes of nutrient. In 1985, China produced 11.4 million nutrient tonnes of nitrogen. Its nitrogen fertilizer capacity will be increased by 13 per cent by 1990, and some old plants will be replaced and others rennovated. Yields from the use of additional fertilizer fell in the 1970s because of the low application of phosphate and potassium. Hence in the 1980s and 1990s more emphasis is being given to increasing production of these nutrients. For phosphates, four new plants are scheduled to come on stream in 1987 and two more later. The first large unit to extract potassium will start up in 1989, but China will continue to rely heavily on imports of this nutrient [109]. Imports of nitrogen and phosphate fertilizers reached a peak in 1984 and are on the decline.

In Brazil, fertilizer consumption increased 73 per cent between 1975 and 1985 and further growth of about 5 per cent per annum is expected up to 1995. Brazil uses a high proportion of the phosphate nutrient (36 per cent of total) and potassium (35 per cent) and less nitrogen compared with other countries [110]. Production boomed in 1980 but fell back sharply in 1981, 1982 and 1983. Although it recovered again in 1984 and 1985, there was little new investment in this industry. The World Bank has granted Brazil a $500 million loan to finance agrarian reform and fertilizer imports [111]. A large new ammonia plant is scheduled for 1990 and there are several new plants planned to produce phosphate fertilizers; the International Finance Corporation may invest in one of these [112].

Fertilizers accounted for just under 10 per cent of India's total import bill in 1984/1985. It is one of the items that can be reduced if capacity utilization (already 75 per cent for nitrogen fertilizers and 85 per cent for phosphate fertilizers) can be further increased. At the same time, delays in commissioning new projects need to be overcome. As India must import considerable quantities of phosphate rock, sulphur and ammonia, one part of the strategy has been to establish joint ventures abroad or to enter into other forms of long-term purchase agreements. Another strategy has been to counter-trade Indian manufactured goods for imports of fertilizers.

Bangladesh, a least-developed country with a population of 100 million and small area of land suitable for cultivation, depends on a successful fertilizer industry. Demand for fertilizers is expected to grow by almost 60 per cent between 1985 and 1990. Despite plans to raise production by 75 per cent, imports may contribute 30 per cent of requirements in 1990. The key to raising nitrogenous fertilizer output is the commissioning of three new urea plants, one in 1988 and two in 1990 [113].

The growth of demand for fertilizers in Tropical Africa is at an early stage of development. Nigeria is the largest user and its consumption increased fourfold between 1975 and 1985. The distribution and marketing system has been improved with advice from the International Fertilizer Development Centre, and further rapid growth in demand is anticipated as food production increases and imports are reduced [114]. A

World Bank loan of $100 million was sufficient to finance almost half the country's import requirements in 1985, but what is needed is local production. A plant to produce urea and compound fertilizers is under construction but additional new capacity may be required in the near future.

The pesticides industry

Developing countries produce 20 per cent of world pesticide production and import 43 per cent of worldwide production of insecticides including the most poisonous. A recent study of demand in nine countries of the Asian and Pacific Region* shows that insecticides account for 62.5 per cent of the regional market, herbicides for 21 per cent and fungicides for 15.1 per cent. Consumption has grown very rapidly, by between 10 and 20 per cent per annum in five countries, by 5 per cent per annum in India and with minimal increases in Bangladesh, Malaysia and Thailand. Approximately 70 per cent of pesticides were formulated locally, but only 4 per cent of the basic ingredients were manufactured locally [115].

The year 1986 brought two major concerns: safety in the manufacture of the basic ingredients and closer regulation of their use. In 1985, all FAO member countries agreed on the International Code of Conduct on the Distribution and Use of Pesticides. Activities related to manufacture of pesticides are being examined by UNIDO in preparation for consideration at a meeting in the 1988-1989 biennium.

The synthetic fibres industry

World production of textile fibres fell by 2.8 per cent in 1985 after a 19 per cent increase in 1984. Man-made fibres increased their market share to 45 per cent, still below the 54 per cent level achieved by 1979. World production of man-made fibres was divided as follows: 42.6 per cent polyester fibres, 21.9 per cent nylon fibres, 19.3 per cent cellulosic fibres, 15.5 per cent acrylic and modacrylic fibres and 0.7 per cent olefin and other fibres [116].

World production capacity of man-made fibres is expected to increase by 3.2 per cent in 1987. About 64 per cent of the increase is for polyester fibres—almost entirely in the Asia and Africa regions. A further 20 per cent is for nylon fibres, with a large increase in the United States and the rest in Africa and Asia. The remaining 12 per cent is in acrylic fibres with a large increase in Eastern Europe and the USSR and the rest in Africa and Asia. Little expansion of man-made fibres capacity is planned in Latin America in 1987 [117].

India is also expanding polyester fibre production with plans to establish 11 units with a total capacity of 180,000 tonnes per year [118]. But China accounts for the major part of the expansion in Asia. In 1986, two plants producing 300,000 tonnes of polyester fibres were brought on stream. UNIDO, by assisting in the establishment of a synthetic fibres research centre, has helped the Government in planning for the utilization of this huge additional output of synthetic fibres. China has expressed a willingness to assist other developing countries in developing a man-made fibre industry through the provision of technical expertise and training.

The synthetic rubber industry

World synthetic rubber production reached a peak in 1979, did not increase between 1980 and 1985, and then rose 3 per cent in 1986. In 1984, styrene butadiene rubber (SBR) accounted for about 50 per cent of synthetic rubber output, butadiene rubber for 19 per cent, isoprene rubber for 4 per cent, polycholoroprene rubber for 6 per cent, ethylene propylene terpolymer for 8 per cent and other types of synthetic rubber for 14 per cent. Most of the capacity in developing countries is for SBR and butadiene rubber ([119], table VII).

(b) *Future prospects*

The output of industrial chemicals in developing countries is expected to increase by 8.4 per cent in 1987 and 8.7 per cent in 1988. In developed countries output is expected to increase by 4.8 per cent in 1987 and 5.2 per cent in 1988. The largest increases in output relative to existing levels is expected in China.

Among the regions of the South, output is expected to grow fastest in Asia, with increases on the Indian Subcontinent of 8.1 per cent in 1987 and 8.7 per cent in 1988, and in South-East Asia of 11.6 per cent in 1987 and 10.9 per cent in 1988. The industry is consolidating rapid advances during the period 1986-1988 in North Africa, where output gains of 5.1 per cent in both 1987 and 1988 are forecast. In Western Asia large gains of 9.2 per cent in 1987 and 8.8 per cent in 1988 are expected. In Latin America, output of chemicals increased sharply in 1986, and further gains of 6.7 per cent in 1987 and 7.7 per cent in 1988 are forecast. There has been insufficient investment in new capacity in Tropical Africa, and gains of 0.3 per cent in 1987 and 2.1 per cent in 1988 reflect that continent's continued heavy reliance on imports.

Demand for basic petrochemicals in developing countries is expected to grow rapidly until 1990 and beyond, with strong demand for plastics and man-made fibres. Between 1984 and 1990, demand for plastics is expected to increase by 70 per cent, that is, about 9 per cent a year. As a result, demand for propylene and ethylene is expected to be more than double in this period. Man-made fibres are the main source of demand for aromatics and demand for benzene, for example, is expected to double between 1984 and 1990. Developing countries will continue to export methanol and their own demand will increase by 65 per cent between 1984 and 1990. There is every prospect that these rates of growth will be sustained in the 1990s.

Increased use of fertilizers has contributed to self-sufficiency in food in Asia over the last 20 years. Fertilizer consumption grew by 9 per cent per annum, mainly because of very intensive use of nitrogen. The use of fertilizer slowed in the early 1980s as sufficient levels of production of rice, other food products, sugar and vegetable oils were reached. Demand for fertilizer will grow less rapidly over the next 15 years, but the composition will be different. Use of nitrogen

*The nine countries were Bangladesh, India, Indonesia, Malaysia, Pakistan, Philippines, Republic of Korea, Sri Lanka and Thailand.

has reached levels close to the economic maximum. The future lies in fertilizers which supply phosphate, potash, sulphur and magnesium in which soils are now deficient. Fertilizer use in Latin America is two thirds of the level in Asia. There is still scope for greater use of nitrogen, and some further increase may be needed in the use of phosphates and potassium.

Fertilizer use in Africa is 14 per cent of the level in Asia. Since the need to produce more food is as great as was the case in Asia in the mid-1960s, a sharp increase in the application of nitrogen fertilizers is necessary; and if soils are not to become deficient in the other nutrients, a balanced application of phosphate and potassium is needed. In the 1990s the fastest growth of fertilizer output should be in Tropical Africa.

In order to maintain or develop self-sufficiency in food production, developing countries must use plant protection measures. Demand for pesticides in developing countries is therefore expected to increase by 50 per cent between 1986 and 1993. Local manufacture of basic ingredients, formulation, distribution and use of pesticides will be much more closely regulated than hitherto. FAO is planning to evaluate the effectiveness of its International Code of Conduct on the Distribution and Use of Pesticides in 1988.

Demand for plastics in developing countries is expected to continue increasing by about 9 per cent a year. Polyvinyl chloride is the plastic used in the largest volume, but with the introduction of low-density polyethylene, demand for polyethylene is catching up. High-density polyethylene, polypropylene and polystyrene are used in smaller quantities in developing countries, but consumption is expected to double between 1984 and 1990.

World output of synthetic rubber is expected to increase by 10.4 per cent between 1986 and 1991. Little increase is expected in Western Europe (6 per cent) and North America (2 per cent), but growth should be more rapid in Latin America (20 per cent) and Asia and Oceania including Japan (14 per cent). Production capacity for synthetic rubber will be increased in 1987 and 1988 in Brazil, India, Mexico and the Republic of Korea [119].

Demand for synthetic fibres is the slowest-growing of all the petrochemical products. Due to the low price of cotton and wool, synthetic fibres are not expected to increase their market share of overall fibre use above 50 per cent, compared to the present level of 45 per cent. Future growth will therefore match total demand for textile fibres. Between 1980 and 1985 demand for man-made fibres increased by the exceptionally fast rate of 87 per cent in the region comprising Africa, Asia and Oceania, and by only 15 per cent in Latin America. For the period 1985-1990, the growth rates may be about the same in Latin America and about half the 1980-1985 rate (5-6 per cent per annum) in Asia. In Tropical Africa and North Africa, with little production of man-made fibres, there is scope for considerable increase in volume and hence a very high growth rate from a small base.

(c) *UNIDO activities*

UNIDO has a wide range of approaches to technical co-operation in this diversified industry (see tables 67 and 68). It is assisting Algeria and the Islamic Republic of Iran in developing a master plan for the entire chemical industry, and is advising several countries on low-waste technologies and pollution control in the chemical industry.

Over the past 20 years, UNIDO has assisted many countries in planning and developing their fertilizer industry and has published a major manual on this subject. In the 1980s, a joint project with the Economic and Social Commission for Asia and the Pacific (ESCAP) and FAO has established a fertilizer advisory, development and information network for the Asian and Pacific region. A similar regional network for pesticides was launched in 1985. These projects basically provide for in-depth examination and exchange of experience on the types of fertilizer and pesticides used, the size of the market and the marketing and distribution system. Assistance is also being given to the Arab Federation of Fertilizer Producers in developing their information system.

In the field of basic petrochemicals, UNIDO has provided technical advice on planning petrochemical complexes in Argentina and Iraq, on the optimization of output from a petrochemicals complex in India, and strengthening research and development capabilities in the field of petrochemicals in Turkey. UNIDO has also assisted Pakistan with a long-term development programme for the synthetic fibres industry and China in establishing a synthetic fibres research centre.

UNIDO has assisted a development centre in the use of plastics for agricultural purposes in Egypt, a similar project in Mexico and a plastics technology centre in Pakistan. It has advised on the processing of polyvinyl chloride in the Democratic People's Republic of Korea.

UNIDO has convened four Consultations on the fertilizer industry, in 1977, 1978, 1980 and 1984, and three on the petrochemical industry, in 1979, 1981 and 1985. For the fertilizer industry, model forms of contract for the construction of a fertilizer plant have been developed, and for the petrochemical industry, a model form of licensing agreement has been developed. Developing countries have welcomed these model forms, which both they and their suppliers acknowledge to have been useful in contractual negotiations for the supply of complete plants and technology. The UNIDO investment promotion service promoted investment in six projects in the industrial chemicals industry in 1985 and 1986 (see table 67).

Table 67. UNIDO-promoted projects in the industrial chemicals industry, 1985 and 1986

Country	*Product*	*Total investment in plant (millions of dollars)*
Cameroon	Organic fertilizer	4.8
Côte d'Ivoire	Organic fertilizer	5.0
Gabon	Organic fertilizer	5.0
Sao Tome and Principe	Organic fertilizer	5.0
United Republic of Tanzania	Organic fertilizer	5.0
China	Polyester	20.0

Table 68. Selected UNIDO technical co-operation projects related to the industrial chemicals industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Algeria	UNDP*	1986—	Plan directeur de développement de l'industrie chimique
Argentina	UNDP**	1981—	Tecnologia y desarrollo para el complejo petroquimico de Bahia Blanca
Bangladesh	UNDP**	1978—	Operation and management of fertilizer plants
Benin	RP	1986—	Restart of sea-salt production
Bolivia	UNDP	1985—	Industrial capacity utilization—rehabilitation of the COSSMIL sulphuric acid plant Eucalipto
Burma	UNDP*	1980—	Establishment of a pilot plant for pesticide formulation
Burundi	UNDP	1978—	Assistance for the production of peat-based fertilizer
China	UNDP/ IDF*	1980—	Research and development in pesticides
	COFN*	1982—	Synthetic fibre research centre
	UNDP*	1985—	Assistance to the Beijing Institute of Chemical Reagents
	UNDP**	1985—	Development of new technologies for phosphate enrichment for the fertilizer industry
	UNDP*	1985—	Compound fertilizer technology centre
	UNDP	1985—	Development of new technologies for phosphate enrichment and processing
	UNDP*	1985—	Strengthening the Research Institute of Synthetic Material Ageing
	UNDP*	1986—	Development of an improved polymethyl methacrylate pyrolysis system
Cuba	UNDP*	1981—	Establecimiento de una planta demostrativa para la formulación de plaguicidas
Czechoslavakia	UNDP	1985—	Advisory assistance on low- and non-waste technology for some chemical processes
Democratic People's Republic of Korea	UNDP	1984—	Assistance in the production of viscose fibres
Egypt	UNDP	1984-1986	Assistance in the commissioning of the pesticide pilot plant
	UNDP**	1981—	Establishment of a multi-purpose pesticide pilot plant
	UNDP	1985—	Fertilizer development programme
Ethiopia	IDF	1985—	Assistance for the establishment of a pilot pesticide formulation plant
Gambia	UNDP	1984—	Establishment of village-type solar sea-salt production
	UNDP	1986—	Salt production and marketing in Darsilami village
Hungary	UNDP*	1981—	Strengthening research on non-toxic insecticides
	UNDP	1986—	Practical development of non-toxic anti-insect agents
India	UNDP**	1980—	Pesticides development programme in India
	UNDP*	1981—	Investigations to produce sulphur and sulphuric acid from Amjhore pyrite deposits
	UNDP*	1981—	Investigations to use low-grade rock phosphate from Mussoorie deposit
	UNDP*	1985—	Strengthening of engineering and consultancy services
	UNDP*	1985—	Development of expertise in fertilizer plant operations
	UNDP*	1985—	Demonstration and training in predictive maintenance for fertilizer industry
Indonesia	UNDP	1985—	Study for integrated development of nitric acid industries
Iran (Islamic Republic of)	UNDP	1985—	Arak petroleum complex
	IDF	1985—	Workshop on project preparation and technology in industrial projects with special reference to the chemical industry
	UNDP	1986	Master plan for development of chemical industry
Kiribati	UNDP*	1980—	Solar salt pilot plant
Lao People's Democratic Republic	UNDP	1982—	Development of the salt industry
Mozambique	OTF*	1982—	Strengthening the sea-salt production capacity
Niger	RP	1984-1986	Experimental production of salt using solar energy
	UNDP	1985—	Assistance à la production semi-industrielle du sel dans les régions de Bilma, Tiguida-in-Tessom et Foga
Nigeria	IDF	1984—	Demonstration plant for salt production by women in the Plateau State
Pakistan	UNDP	1983—	Preventive maintenance programme of the Federal Chemical and Ceramics Corporation Ltd.
	UNDP*	1983—	Fertilizer research and development institute
	UNDP*	1984—	Long-term development programme for the synthetic fibre industry

Table 68 (continued)

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Philippines	UNDP	1980—	Production of ethanol from cellulosic materials, techno-economic and design studies for the establishment of a pilot plant, preparatory assistance
	IDF*	1981—	Establishment of a pilot plant for the production of alcohol from cellulosic raw materials
	UNDPTF*	1981—	Industrial chemicals from indigenous carbohydrate raw materials (sucro-based chemicals)
Republic of Korea	UNDP*	1982—	Toxicology research laboratory
Romania	UNDP*	1982—	Technologies for chemical industries based on biomass
	UNDP	1984—	Anticorrosive protection materials manufactured from indigenous raw materials used in the man-made fibre industry
Saudi Arabia	UNDP	1985-1986	Technical assistance for downstream petrochemical industries
Trinidad and Tobago	UNDP	1981—	Assistance in salt production
Tonga	UNDP	1985-1986	Desalination of soils
Turkey	UNDP	1985—	Advisory assistance in salt production
United Republic of Tanzania	UNDP	1986—	Expert assistance for the establishment of a pesticide pilot plant under a soft loan advance from the Italian Government
Yugoslavia	UNDP	1982—	Development of polyester synthesis and processing technology for polyurethanes and other industrial applications (associated agency: WHO)
	UNDP	1986—	High-level assistance to reclaim butyl production
Zambia	UNDP	1982—	Assistance to Nitrogen Chemicals of Zambia Limited
Zimbabwe	UNDP	1985—	Assistance to the fertilizer industry
Africa	IDF	1983-1986	Assistance in the development of the phosphate fertilizer industry
	RP	1985-1986	Preliminary assistance to the Preferential Trade Area for fertilizer industry development
	UNDP**	1986—	Manufacture of industrial chemicals in Southern African Development Co-ordination Conference countries
Arab countries	IDF	1986	Technical seminar on salt production in the Arab world, Amman, 4-6 May 1986
	IDF	1986—	Assistance in developing the information system of the Arab Federation of Chemical Fertilizers Producers
Asia and the Pacific	UNDP*	1982-1986	Preparatory assistance mission to finalize the project document for the intercountry co-operation in pesticide development in Latin America
	IDF	1984-1986	ESCAP/FAO/UNIDO Fertilizer Advisory, Development and Information Network for Asia and the Pacific (associated agency: ESCAP)
	UNDP**	1985—	Regional network on pesticides for Asia and the Pacific (associated agencies: FAO, ESCAP, WHO)
Global	UNDP	1985—	Workshop on hazardous materials/waste management, industrial safety in chemical industry and emergency planning: guidelines for Governments and industries—a plan of action for UNIDO; 6-10 April 1987, Vienna
Interregional	IDF	1982-1986	Technical evaluation of desalination technologies using solar energy
	IDF	1985-1986	Twelfth In-Plant Group Training Programme on synthetic fibres—"Application of synthetic fibres in textile processing", Vienna, 30 September-25 October 1985
	IDF	1985-1986	Eighth workshop on fertilizer plant maintenance
	IDF*	1983—	Technical support programme for fermentation ethanol production for use as fuel and chemical feedstock in developing countries
	IDF	1985—	Expert group meeting for development of phosphate fertilizer industry in developing countries, 18-22 November 1985, Tunis
	IDF	1986—	Seventeenth In-Plant Group Training Programme in the field of plastics technology, Vienna, 29 September-14 November 1986
	IDF	1986—	Thirteenth In-Plant Group Training Programme on synthetic fibres—"Applications of synthetic fibres in textile processing", Vienna, 29 September-31 October 1986
	IDF	1986—	Ninth workshop on fertilizer plant maintenance
	RP	1986—	Interregional course on advance analytical techniques—trace element analysis, Seibersdorf, Vienna
	IDF*	1986—	Workshop on upgrading fermentation alcohol production technology for use as fuel and chemical feedstock in developing countries, Rajamaeki, Finland, 8 September-30 October 1986

For footnotes see table 46.

13. *Other chemical products (ISIC 352)*

Paints, varnishes, lacquers

Drugs, medicines

Soaps, detergents, perfumes, cosmetics, essential oils

Explosives

(a) *Present situation*

This industry is as large as the industrial chemicals industry, accounting for 5.6 per cent of total manufacturing output in the South and 3.5 per cent in the North in 1985. It accounts for 7.6 per cent of manufacturing output in Tropical Africa, 6.6 per cent in Latin America, 6.6 per cent in the Indian Subcontinent, 4.9 per cent in North Africa, 3.9 per cent in Western Asia and 3.8 per cent in South-East Asia (see figure XXXI for regional trends).

Between 1970 and 1985, output increased faster in developing countries than in developed countries (7 per cent versus 4 per cent per annum). As a result, the developing countries' share of world industrial output in this industry increased from 11.9 per cent in 1970 to 17.2 per cent in 1985 on the basis of a sample of 82 countries, or from 13.4 to 18.9 per cent on the basis of data from 165 countries.

The pharmaceutical industry accounts for between 25 per cent and 55 per cent of the output of the other chemicals industry in developing countries. The most important other products are soap, detergents, paints and varnishes. Soap and paints are usually the first products to be produced in this industry in a least developed country.

The pharmaceutical industry

The value of world shipments of pharmaceutical products outside the USSR and Eastern Europe is estimated to have been $80 billion in 1985, of which 34 per cent were sales in the United States, 24 per cent in Japan and 28 per cent in Western Europe. Latin America accounted for 7 per cent and all other countries (mostly developing countries) the remaining 7 per cent [120].

The first step in manufacturing pharmaceuticals is the formulation of active ingredients into dosage forms. The developing countries as a group formulated about 75 per cent of their requirements for finished drugs in 1980 compared with 50 per cent in 1960. Only a few developing countries, Argentina, Brazil, India and Mexico, produced a wide range of active ingredients. Most developing countries still rely heavily on imports of drugs and medicines; these increased rapidly to a level over $5 billion in 1983. About one third of these imports are estimated to be of active ingredients and two thirds formulated products [121]. To obtain the maximum value added in this industry, developing countries need to produce more of the active ingredients themselves.

Transnational corporations play a more dominant role in the pharmaceutical industry than in any other industry except perhaps soft drinks. The world's largest 50 pharmaceutical companies accounted for two thirds of world output in 1982. Transnational corporations supplied about 50 per cent of the developing countries' consumption of pharmaceuticals; supplies are divided about equally between local production in developing countries and direct imports from developed countries [121].

Other chemical industries

Paints and varnishes can be produced with simple, well-known technologies or with advanced technologies which give the surface coatings special qualities, such as durability, resistance to corrosion and rust, ease of application, etc. The most important advances in the paint industry have been the introduction of water-based and acrylic paints.

The production of perfumes, cosmetics and essential oils is based on natural raw materials and production has been started in a wide range of developing countries.

Production of synthetic detergents is an important part of the basic chemical industry and has so far been developed in only a few developing countries that have a petrochemical plant producing the basic raw materials.

(b) *Future prospects*

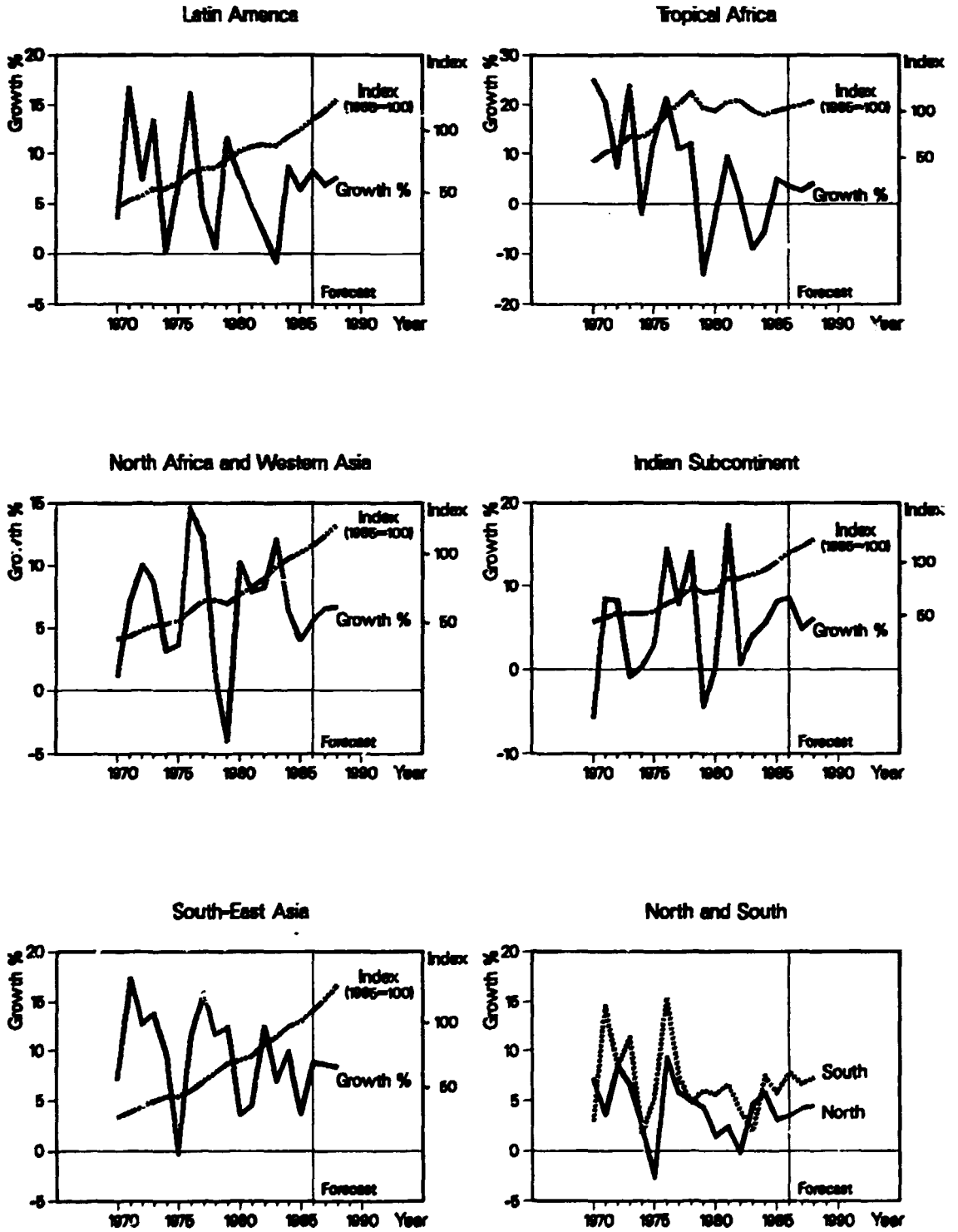
The output of other chemicals in developing countries is expected to increase by about 6.7 per cent in 1987 and 7.3 per cent in 1988. Output in developed countries is expected to grow by about 4.3 per cent in 1987 and 4.7 per cent in 1988. The output of drugs and medicines (the pharmaceutical industry) is the fastest growing part of this branch of industry.

Among developing regions, output is expected to grow fastest in South-East Asia (8.7 per cent in 1987 and 8.5 per cent in 1988) and in Latin America (6.8 per cent in 1987 and 7.6 per cent in 1988). In the Indian Subcontinent, where India already has a large basic pharmaceutical industry, growth is forecast at 4.7 per cent in 1987 and 6 per cent in 1988. Rapid growth is also expected in North Africa (7.3 per cent in 1987 and 7.7 per cent in 1988) and in Western Asia (6 per cent in both 1987 and 1988). For Tropical Africa the forecast of output growth by 3.3 per cent in 1987 and 4.3 per cent in 1988 assumes a continuing high level of dependence on imports.

The pharmaceutical industry is a high-technology industry. Research is the driving force and is mainly aimed at developing drugs which can be sold in high volume in developed countries to cure diseases prevalent in these countries. Thus the top-selling drugs are for ulcers, heart disease, arthritis, anxiety, infections (antibiotics) and high blood pressure. UNIDO activities through consultations and technical assistance have helped to focus international attention on the requirements of the growing pharmaceutical industry in developing countries.

The requirements will become even more important in the 1990s. In the 1980s the annual rate of growth of drug sales in real terms in developed countries has slowed down from 15 per cent in the 1970s to perhaps half that level, whereas demand in developing countries has continued to grow at a pace in excess of 10 per cent per annum. This industry will continue to

Figure XXXI. Other chemical products (ISIC 352)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/IPR/GLD.

be one of the high-technology industries in developed countries until the next century. For developing countries, it is still a priority industry needed to satisfy basic health-care needs for a large and fast-growing population.

The most important technological advances in this industry involve the development of new drugs, and in the 1980s these have been primarily drugs for heart disease, high blood pressure and ulcers. The range of families of antibiotics continues to expand. Perhaps the most important recent development has been the introduction of drugs providing sustained release of the active ingredients. In the field of tropical diseases, developments include new ways to combat hepatitis and malaria.

The tight grip which patents give the pharmaceutical companies inventing new drugs is slowly being relaxed because the wave of innovation was in the 1960s and patents last less than 20 years. By the end of 1986, 120 out of the 200 top-selling pharmaceutical products in the United States were no longer patented. By 1990, nearly all of the patents will have expired. Sales of generic drugs now account for more than 20 per cent of the United States market, but so far only 3 per cent of the Western European market. Drugs sold under their generic name are generally cheaper, although their quality may be slightly less perfect than that of the leading brand-name drugs. The lower prices resulting from such competition are particularly welcome to developing countries, which have a very limited budget for health care.

The long-term prospect, then, is that the pharmaceutical industry in developing countries will give priority to producing a limited range of low-cost but effective drugs and medicines. The co-operation of transnational pharmaceutical companies will continue to be required by a wide range of developing countries because their experience and technology are essential if their enormous health care needs are to be met, both efficiently and economically.

(c) *UNIDO activities*

At two UNIDO Consultations on the pharmaceutical industry in 1980 and 1983, the following well-known obstacles to more rapid development of the industry in developing countries were discussed: the availability and terms and conditions for obtaining technology; the pricing and availability of active ingredients supplied to developing countries for formulation; the lack of knowledge on alternative sources of supply; the proliferation of brand names rather than the use of generic chemical names in the marketing of pharmaceutical products; and the failure to promote research and development facilities in developing countries that would make their pharmaceutical industry self-supporting. At the Second Consultation, ways to promote the development of drugs based on medicinal plants and biologicals, including the production of vaccines in developing countries, were discussed.

One of the largest UNIDO programmes of technical co-operation to any single industry is to the pharmaceutical industry (see tables 69 and 70). A list of the projects active in 1986 is given in table 70. Antibiotics are a vital group of drugs in curing infectious diseases. UNIDO is assisting Algeria in bringing a large plant costing $200 million into production. In Cuba, UNIDO carried out a multi-purpose pharmaceutical plant project that is producing fifteen bulk drugs of wide range. The countries of the Southern African Development Co-ordination Conference have been assisted in the production of drugs for veterinary use, and institutes in Egypt and Tunisia, applying biotechnology and genetics to the pharmaceutical industry, also received UNIDO assistance. The Organization has been called on less frequently to advise on the manufacture of the range of other chemical products covered by this industry. The UNIDO investment promotion service has promoted investment in five projects in this industry in 1985 and 1986 (see table 69).

Table 69. UNIDO-promoted investments in the other chemicals industry, 1985 and 1986

Country	*Product or establishment promoted*	*Investment (millions of dollars)*
China	Antibiotics	0.30
	Cosmetics	...
Egypt	Pharmaceuticals	1.60
	Paints	1.30
Jamaica	Soap and detergents	1.20
Malawi	Pharmaceuticals	1.80
Turkey	Blood donation centre	22.00

Table 70. Selected UNIDO technical co-operation projects related to the other chemicals industry

Region, country or area	*Source of funds*[a]	*Executing period*[b]	*Project title*[c]
Afghanistan	UNDP	1982—	Assistance in the establishment of a facility for extraction of liquorice root and similar industrial natural products
Algeria	IDF*	1985—	Establishment of a development plan for the pharmaceutical industry
	UNDP	1986--	Etude sur la production d'articles de conditionnement en verre et plastique pour l'industrie pharmaceutique
	UNDP	1986—	Identification urgente des problèmes industriels et plan d'action au complexe antibiotique de Médéa
Bangladesh	UNDP*	1983—	Bangladesh Insulator and Sanitary Ware Factory Ltd.
Bhutan	RP	1984-1986	Medicinal herbs plantation and a pharmaceuticals processing unit
Burkina Faso	IDF*	1981--	Assistance à la production de produits pharmaceutiques à partir de plantes médicinales sélectionnées

Table 70 *(continued)*

Region, country or area	*Source of funds*[a]	*Executing period*[b]	*Project title*[c]
Cameroon	UNDP*	1977-1986	Assistance in the development of the production of vaccines, essential oils and pharmaceuticals
Cape Verde	UNDP	1982-1986	Assistance for the production of pharmaceuticals
China	UNDP*	1984—	Research and development in dyestuffs
	UNDP**	1985—	Development and application of silicones
Cuba	IDF/ UNDP**	1978-1986	Establishment of a multi-purpose plant for basic pharmaceutical chemicals
	UNDP*	1981—	Centre for the development of the pharmaceutical industry
	UNDP	1984—	Technical assistance to the National Centre for Biological Investigation
Democratic People's Republic of Korea	UNDP	1984—	Assistance in the production of dyestuffs
Egypt	UNDP	1985—	Technical assistance to the Egyptian National Centre for Genetic Engineering and Biotechnology
Guinea	UNDP**	1978-1986	Rehabilitation and establishment of a local pharmaceutical plant
	RP**	1985-1986	Establishment of a pilot demonstration plant for production of oral rehydration salts and intravenous fluids
India	UNDP	1981-1986	Modernization of facilities for the manufacture of anti-malaria drugs
	UNDP**	1980—	Bioscience and engineering
	IDF	1984—	Upgrading of technology for the extraction of alkaloids from opium
Iran (Islamic Republic of)	UNDP**	1983—	Establishment of a pharmaceutical chemicals multi-purpose pilot plant
Madagascar	UNDP	1984-1986	Rehabilitation of the BCG production laboratory
	UNDP*	1984—	Assistance au Centre national de recherches pharmaceutiques pour la fabrication de produits pharmaceutiques à partir de plantes médicinales
Mongolia	UNDP*	1982—	Assistance to the experimental centre of applied enzymology and microbiology in the production of sterile enzyme products
	UNDP*	1982—	Progamme "BIOMED" (associated agency: WHO)
	UNDP*	1984—	Demonstration of modern technology for drug-packing
Mozambique	UNDP*	1980—	Production of oral rehydration salts
	UNDP*	1983—	Preparatory assistance for the establishment of a pilot plant for pharmaceuticals
Nepal	COFN*	1973—	Primary health support services programme
	UNDP**	1980—	Strengthening the Royal Drugs Research Laboratory (associated agency: WHO)
	UNDP*	1980—	Processing of cultivated and collected medicinal plants
Nicaragua	UNDP*	1983—	Development of the pharmaceutical industry
Peru	IDF	1983-1986	Creation of a centre for bio-technology applied to pharmaceuticals (antibiotics)
Philippines	UNDP*	1985—	Pilot plant production of citric acid
Republic of Korea	UNDP*	1986—	Screening centre for pharmaceuticals
Rwanda	UNDP*	1980—	Production de médicaments à base de plantes médicinales
	RP*	1985—	Installation d'un laboratoire pour l'analyse et le contrôle de qualité des produits dérivés du quinquina
Thailand	UNDP	1984—	Technical assistance to increase the efficiency of pharmaceutical equipment in the Government Pharmaceutical Organization
	UNDP*	1982—	Assistance in the production of pharmaceuticals from the Thai traditional pharmacopeia
Tunisia	UNDP	1985—	Urgent fact-finding mission to the newly created biotechnology centre in Sfax
Turkey	UNDP*	1982—	Production of pharmaceutical materials from medicinal plants
United Republic of Tanzania	UNDP*	1977 –	Assistance in the establishment of a pharmaceutical plant in Zanzibar
	UNDP*	1981—	Assistance for the production of plant-derived pharmaceuticals
Venezuela	UNDP	1986	Technical assistance for pharmaceuticals production
Viet Nam	UNDP**	1980—	Pilot production of medicines using indigenous raw materials
	UNDP	1984--	Production of standards and reagents for quality control of medicines
	UNDP	1984—	Development of industrial production of essential oils, aromas and flavours
	UNDP	1985—	Pilot production of dyes and pigments
Zaire	UNDP	1984-1986	Mission préparatoire à l'industrie pharmaceutique

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Zambia	IDF	1982-1986	Production of oral rehydration salts
	UNDP	1986—	Assistance in diversification and expansion of manufacturing facilities for pharmaceuticals
Africa	IDF*	1978—	Pilot plant for the production of medicaments in Cape Verde Islands
	IDF	1983—	General investment opportunity study on the development of the pharmaceutical industry in countries of the West African Monetary Union
	IDF	1983—	Programme for the production of vaccine in Africa
	IDF	1986—	Assistance in the production of veterinary drugs in countries of the Southern African Development Co-ordination Conference
Asia and the Pacific	IDF	1983—	Group training programme in the field of quality control and assurance in the pharmaceutical industry, Pimpri, India, 20-31 January 1986
	IDF	1983—	Production of biologicals, a survey
	IDF	1985—	Réunion technique sur les conditions de la production industrielle de dérivés du sang dans les pays de l'Asie, Macao, 1-8 December 1986
Latin America	IDF	1983-1986	Réunion technique sur la production industrielle de dérivés du sang
	IDF	1984-1986	Technical assistance for the production of essential drugs
	UNDP	1985-1986	Assistance in the design of a system for collection of pancreas
	IDF	1985-1986	Participation in the second seminar on interferon and first seminar on biotechnology in Havana, 17-22 February 1986
	UNDP	1983—	Preparatory phase for the establishment of a sub-regional centre for research and development in biotechnology and genetics for pharmaceutical products
Global	IDF	1984—	Programme and requirements for production of biologicals in developing countries
	IDF	1984—	Model programme for the production of vaccines in developing countries
Interregional	IDF	1986	Fourth meeting of the advisory Panel on Preventive Medicine, Ottawa, 10-23 March 1986

For footnotes see table 46.

*14. Petroleum refining (ISIC 353)**

Gasoline
Fuel oils
Lubricating oils and greases

(a) *Present situation*

The petroleum refining industry contributes 5.5 per cent of total manufacturing output in developing countries and 1.7 per cent in developed countries. The contribution is highest in Western Asia (7.8 per cent), North Africa (10 per cent) and East and South-East Asia (7 per cent).

Between 1970 and 1985, output grew rapidly in developing countries (6.5 per cent) and very slowly in developed countries (1.1 per cent). As a result the developing countries' share of world refining output (measured in terms of value added) rose from 16.6 per cent to 29.4 per cent on the basis of a sample of 82 countries, or from 18.8 to 33.6 per cent on the basis of data from 165 countries (see figure XXXII for regional trends).

The fall in oil prices in 1986 set in motion forces that will increase demand for petroleum products, depress supplies of crude oil from high-cost fields, and continue pressures for oil-exporting developing countries to integrate forward to assure markets for their crude oil and refined products.

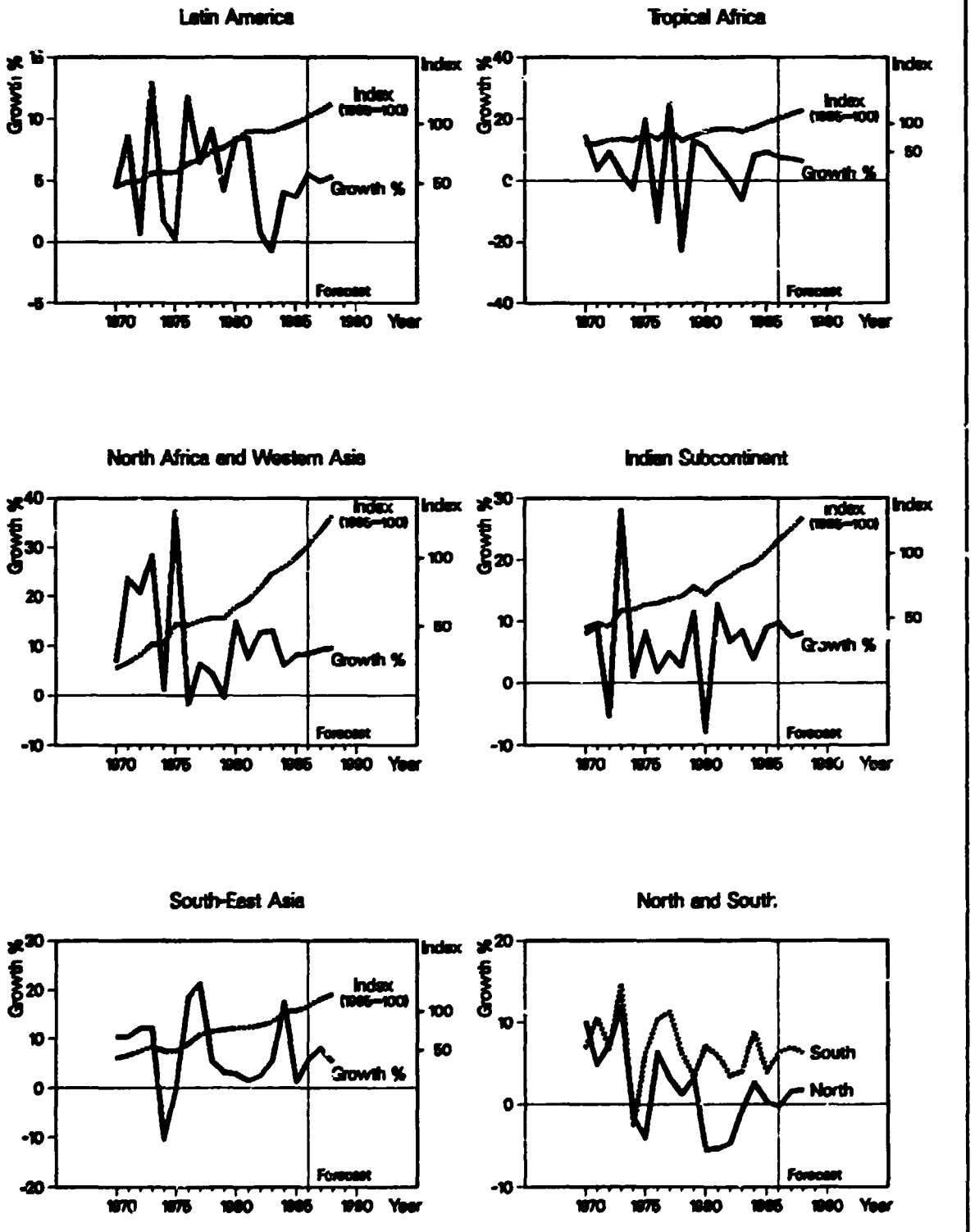
In 1986, OPEC suppliers continued to purchase existing refineries in developed countries to obtain tied outlets. Venezuela was one of the most active, purchasing a refinery in the United States as well as one in the Federal Republic of Germany.

World demand for oil, which rose by 2 per cent in 1986, is expected to rise by an additional 1.5 per cent in 1987 and increase further in 1988. Consumption is rising for the following two reasons: oil is more competitive in price with other fuels, especially natural gas; and the main impact of energy conservation measures has already been felt. The march towards more efficient utilization of energy will continue, but at a reduced pace. More efficient machinery, building processes and vehicles—the legacy of the price increases of the 1970s and, in some cases, legislative mandates—are a permanent part of the energy outlook.

Investment in the energy supply industry worldwide is likely to decline in 1987 before recovering in 1988 because capital investments are closely correlated with cash earnings of the previous year. Nevertheless, developing countries are in line to capture a larger percentage share of the total investments, and some individual countries may succeed in gaining larger capital outlays on exploration than in previous years. World refining capacity is adequate to meet expected product demand for the foreseeable future. However, individual countries will proceed with new basic capacity where national needs or policies in favour of exporting finished products justify an increase in refining capacity.

*UNIDO acknowledges a contribution from Gene T. Kinney, Editor, *Oil and Gas Journal* (Tulsa, Oklahoma).

Figure XXXII. Petroleum refineries (ISIC 353)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

World refinery capacity utilization in 1986 was probably of the order of 78 per cent compared to 76 per cent in 1985 and 74 per cent in 1984, thanks to a massive 30 per cent contraction of the industry's capacity in developed countries outside Eastern Europe and the USSR over the last five years. As a result, profit margins in the industry improved in 1986 and should continue to do so in 1987.

For the period 1987-1990, developing countries have planned most of the increase in world refining capacity (see table 71). In relation to the existing refining capacity, projected growth of capacity is larger in the Middle East than in Latin America and East Asia. The total planned growth of capacity is a little smaller than reported in last year's *Report* because low oil prices have made oil-exporting countries less ambitious about exporting large quantities of refined petroleum, and because their capability to finance the huge investment in new export-oriented refineries has been reduced (see table 72). The largest increase in refining capacity up to 1990 will be in the Islamic Republic of Iran, Mexico, and Saudi Arabia. India is building three new refineries and Egypt plans a large expansion of refining capacity.

In Latin America, Brazil and Colombia increased output of crude oil in 1986. The latter country, with new oil discoveries, boosted output by 70 per cent to 301,000 barrels per day and became an exporter. Production from the new Cano Limon field could rise to full capacity in 1987 with a higher level of exports. Brazil, with two giant discoveries in the offshore Campos basin, is gaining in its drive towards self-sufficiency. Production rose by 5.3 per cent in 1986 and is set to increase further in 1987. In Mexico, crude oil production fell by 11 per cent in 1986, but PELLEX is increasing capital investment in order to sustain crude oil production capacity.

There was an unexpected increase in the throughput of Singapore's large refining complex in 1986. Less crude oil from Saudi Arabia was processed and China and the Islamic Republic of Iran became large users of Singapore's refineries.

Table 71. World petroleum refining capacity and planned additions, 1985-1990

(Millions of tonnes per year)

Region	Existing capacity 1985	New refineries planned 1985-1990	Expansions planned 1985-1990	Eventual capacity 1990
Africa[a]	127	15.6	1.3	144
Western Asia	186	21.3	7.3	215
East Asia[b]	539	12.0	3.8	555
Latin America	357	0.5	20.6	378
Subtotal	1 209	49.4	33.0	1 292
Western Europe	727	5.0	2.5	735
North America	862	—	—	862
Subtotal	1 589	5.0	2.5	1 597
Grand total[c]	2 798			2 889

[a]Including North Africa and South Africa.

[b]Including Australia and New Zealand.

[c]Including China, but excluding the USSR and Eastern Europe.

Table 72. Petroleum refining capacity in 1986 and additions to capacity in various developing countries in 1987-1990

(Thousand of barrels per day)

Country	Capacity in 1986	Additions to capacity in 1987-1990	
		1986 estimate[a]	1987 estimate
Africa			
Egypt	369	162	162
Libyan Arab Jamahiriya	350	...	...
Nigeria	272	150	25
Western Asia			
Iran (Islamic Republic of)	670	250	440
Iraq	365	150	...
Kuwait	614	115	115
Oman	...	...	30
Saudi Arabia	1 548	475	325
United Arab Emirates	196	100	...
East and South Asia			
India	933	120	204
Malaysia	...	120	...
Republic of Korea	836	...	60
Thailand	...	32	35
Latin America			
Argentina	720	...	42
Ecuador	95	35	45
Mexico	1 269	300	320
Peru	...	15	15

Sources: Existing capacity: *British Petroleum Statistical Review of World Energy*, June 1986; additions to capacity: "World survey of refineries: worthwhile profits at last", *Petroleum Economist*, September 1986.

[a]Based on *Global Report 1986*.

(b) *Future prospects*

The output of the petroleum refining industry in developing countries is expected to increase by 6.8 per cent in 1987 and 5.9 per cent in 1988. In developed countries output is expected to increase by 1.8 per cent in 1987 and 1.9 per cent in 1988.

Petroleum refining production is expected to grow rapidly in North Africa (11.6 per cent in 1987 and 11.7 per cent in 1988) and Western Asia (8 per cent in 1987 and 8.3 per cent in 1988) and in the Indian Subcontinent (7.5 per cent in 1987 and 8 per cent in 1988). For South-East Asia, further output growth of 7.5 per cent in 1987 and 4 per cent in 1988 is forecast. For Tropical Africa, output growth of 7 per cent in 1987 and 6.2 per cent in 1988 is projected. In Latin America, refining output is forecast to rise by 4.9 per cent in 1987 and 5.3 per cent in 1988.

Over the longer term, demand for crude oil is expected to grow faster in developing countries. The growth of consumption in developed countries is expected to be below 1 per cent per annum. Faster growth will be deterred by conservation and national biases in favour of natural gas, coal and nuclear energy. In developing countries outside OPEC, demand for crude oil grew at a 3.4 per cent annual rate during the period 1970-1985, and further annual growth rates

Table 73. Selected UNIDO technical co-operation projects related to the petroleum refineries industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Comoros	OTF	1985-1986	Consultancy services for petroleum storage
Democratic People's Republic of Korea	UNDP*	1981—	Catalyst research and development for industrial applications
Egypt	UNDP*	1981—	Engineering for petroleum and processing industries
Ghana	UNDP	1986—	Technical assistance for a petroleum products pricing study
India	UNDP*	1984—	Performance optimization of the petrochemical complex at the Indian Petrochemicals Corporation Ltd.
Turkey	UNDP**	1980—	Strengthening research and development capabilities in the field of petrochemicals
United Republic of Tanzania	IDF	1985—	Technical adviser for the Tanzania Petroleum Development Corporation
Africa	UNDP**	1983—	Regional petroleum training centre (Southern African Development Co-ordination Conference)
Global	IDF	1983-1986	Blending of alcohols with diesel fuels
Interregional	IDF	1985-1986	Workshop on maintenance and plant inspection in petroleum industries, Vienna, 17 February-7 March 1986

For footnotes see table 46.

approaching 3 per cent are expected for the next several years. These larger gains are forecast because of rapid population growth and inadequate infrastructure to support extensive substitution of other fuels.

Since there is still excess refining capacity in Japan, North America and Western Europe, nearly all of the new additions to capacity in this industry will be concentrated in the developing regions in the period 1985-1990. Another feature of the 1990s will be that non-OPEC oil production is expected to level out and the output of OPEC members is expected to rise again. Most observers predict a firming of oil prices early in the 1990s. This would help the industry to finance new investment in refineries. In the meantime, the expansion of refining capacity in the South in the period up to 1990 is low by historical standards, 7 per cent over the five-year period 1985-1990 (see table 71).

As exploration activity intensifies, a wider range of developing countries are expected to become significant producers of oil in the 1990s. Some of the new producing countries will match their increased production of crude oil with new refining capacity.

In the years ahead, technology will adapt existing refineries to produce what the market requires. Additional conversion capacity to process heavy fraction of the barrels into light products will be needed. Middle distillates—kerosene and diesel—will be the fastest-growing refinery products in the years ahead. Gasoline consumption will grow also, but consumption will be limited by continued improvement in vehicle efficiency, increased consumer taxes, and greater market penetration by diesel passenger cars. Demand for other petroleum products, mainly liquefied petroleum gases, petrochemical feedstocks, lubricants and bitumen will grow more rapidly than gasoline. Residual fuel oil will enjoy substantial growth also, benefiting from a price that is more competitive with gas and coal for use in industrial and utility boilers.

(c) *UNIDO activities*

UNIDO assisted developing countries in 1986 in planning petroleum refineries, choosing technology and catalysts, training personnel and formulating a petroleum products pricing policy (see table 73).

15. Miscellaneous petroleum and coal products (ISIC 354)

Asphalt, coal (bitumen), paving and roofing materials

Blended lubricating oils, greases

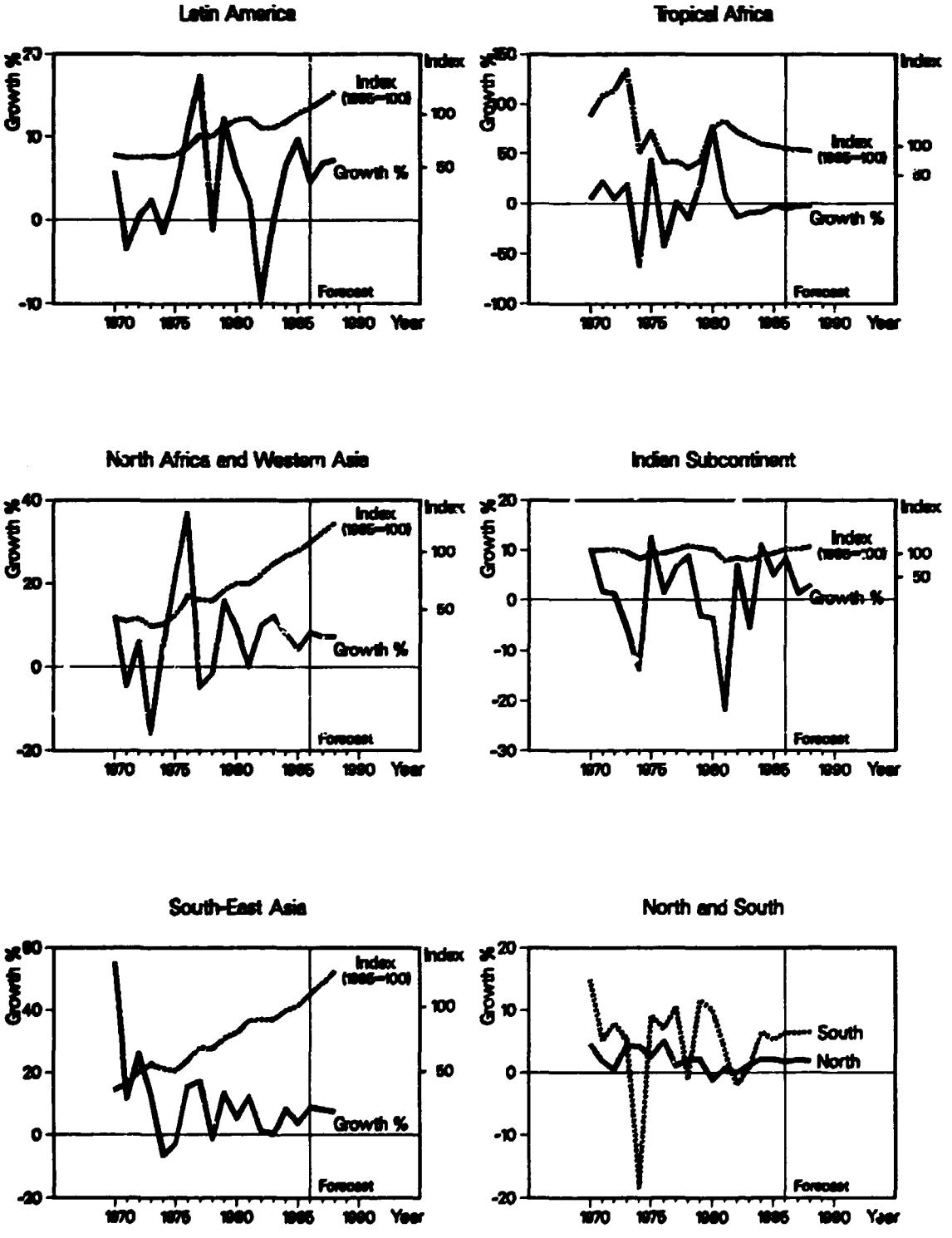
Distillation of coal in coke ovens

(a) *Present situation*

This is a small industry that accounts for only 0.7 per cent of total manufacturing output in both developing and developed countries. Between 1970 and 1985, output in this industry increased by 3.9 per cent per annum in developing countries and by 1.9 per cent per annum in developed countries. As a result, the developing countries' share of output increased between 1970 and 1985 from 9.2 to 12 per cent on the basis of a sample of 82 countries, or from 9.9 to 14.7 per cent on the basis of data from 165 countries (see figure XXXIII for regional trends).

The main petroleum-based products are bitumen (asphalt), which is used mainly for road-surfacing, liquefied petroleum gas, which is used domestically for cooking and is exported, and lubricating oils, which are used in motor vehicles and all machinery with moving parts. The main coal product included is coke produced by the dry distillation of hard coal and oven-coke associated with steel production.

Figure XXXIII. Miscellaneous petroleum and coal products (ISIC 354)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SPPLO.

Table 74. Selected UNIDO technical co-operation projects related to the petroleum and coal products industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Bulgaria	UNDP*	1981—	Development of low-calorific-value coal technologies
Burkina Faso	UNDP	1986—	Assistance pour l'installation d'une unité de recyclage des huiles usées
China	UNDP*	1985—	Beijing speciality gas research and development centre
India	UNDP*	1982-1986	Techno-economic feasibility study for the production of synthetic oil from coal
	UNDP**	1980—	Coal gasification
Poland	UNDP**	1977-1986	Integrated coal conversion (in association with the United Nations Department of Technical Co-operation for Development)
	UNDP	1982—	Liquefaction of coal
Republic of Korea	UNDP	1982—	Low-grade coal utilization and property analysis
Sudan	UNDP	1982-1986	Gasification of agricultural residues
Togo	UNDP	1986—	Assistance en vue de l'installation d'une unité de recyclage des huiles usées
Africa	RP*	1985-1986	Demonstration programme on use of indigenous biomass resources for meeting energy needs
Interregional	IDF	1983-1986	Comité consultatif pour la production d'énergie à partir de sous-produits et déchets de l'agro-industrie
	IDF	1986—	Workshop on low-rank coal utilization, Varna, Bulgaria, 14-17 October 1986

For footnotes see table 46.

The largest producers of bitumen among developing countries with large refineries are Brazil, India, Mexico and Saudi Arabia. Between 1975 and 1984, bitumen production rose 50 per cent in Latin America, 50 per cent in Africa and about 150 per cent in Asia. In this period there was no increase in bitumen output in North America, Western Europe and Eastern Europe, while output of bitumen rose by 20 per cent in Japan and 50 per cent in the USSR.

Between 1975 and 1985, output of lubricating oils increased by 40 per cent in Latin America, 200 per cent in Africa and 100 per cent in Asia. The largest exporters of lubricating oils are Singapore and Netherlands Antilles. The largest producers for the home market are developing countries with the largest industrial sectors, namely Argentina, Brazil, India, Mexico and the Republic of Korea.

Output of coal products has grown only slowly. The largest volume of coke production is found in Latin America (Argentina, Brazil, Chile and Mexico), East and South Asia (India, Republic of Korea) and Western Asia (Turkey).

(b) *Future prospects*

The output of other petroleum and coal products is expected to increase by 6.3 per cent in 1987 and 6.4 per cent in 1988 in developing countries, and by 2 per cent in 1987 and 1.8 per cent in 1988 in developed countries.

Output is expected to grow fastest in North Africa (9.1 per cent in 1987 and 9.7 per cent in 1988), in Western Asia (6.4 per cent in 1987 and 5.9 per cent in 1988), in South-East Asia (8 per cent in 1987 and 7.4 per cent 1988) and in Latin America (6.8 per cent in 1987 and 7.2 per cent in 1988). Further slow growth is expected in the Indian Subcontinent (1.9 per cent in 1987 and 3.5 per cent in 1988). In Tropical Africa output is expected to fall slightly in 1987 and stagnate in 1988.

In developing countries, increased output of bitumen will be required for road construction and maintenance. Much higher production of lubricating oils will be needed by the growing stock of motor vehicles and machines with moving parts. Growth rates of between 5 and 7 per cent per annum can be envisaged over the long term.

Forecast demand for coal products such as coke is lower than one year ago because of the fall in the price of oil. Production will increase less rapidly than the output of steel in developing countries.

(c) *UNIDO activities*

UNIDO technical co-operation activities in respect of the petroleum refineries covers a wide range of products. The projects listed in table 74 cover coal gasification and liquefaction and utilization of low-calorific-value coal. Also included are projects relating to the production of ethanol from biomass (a global project) and the composting of municipal waste.

16. Rubber products (ISIC 355)

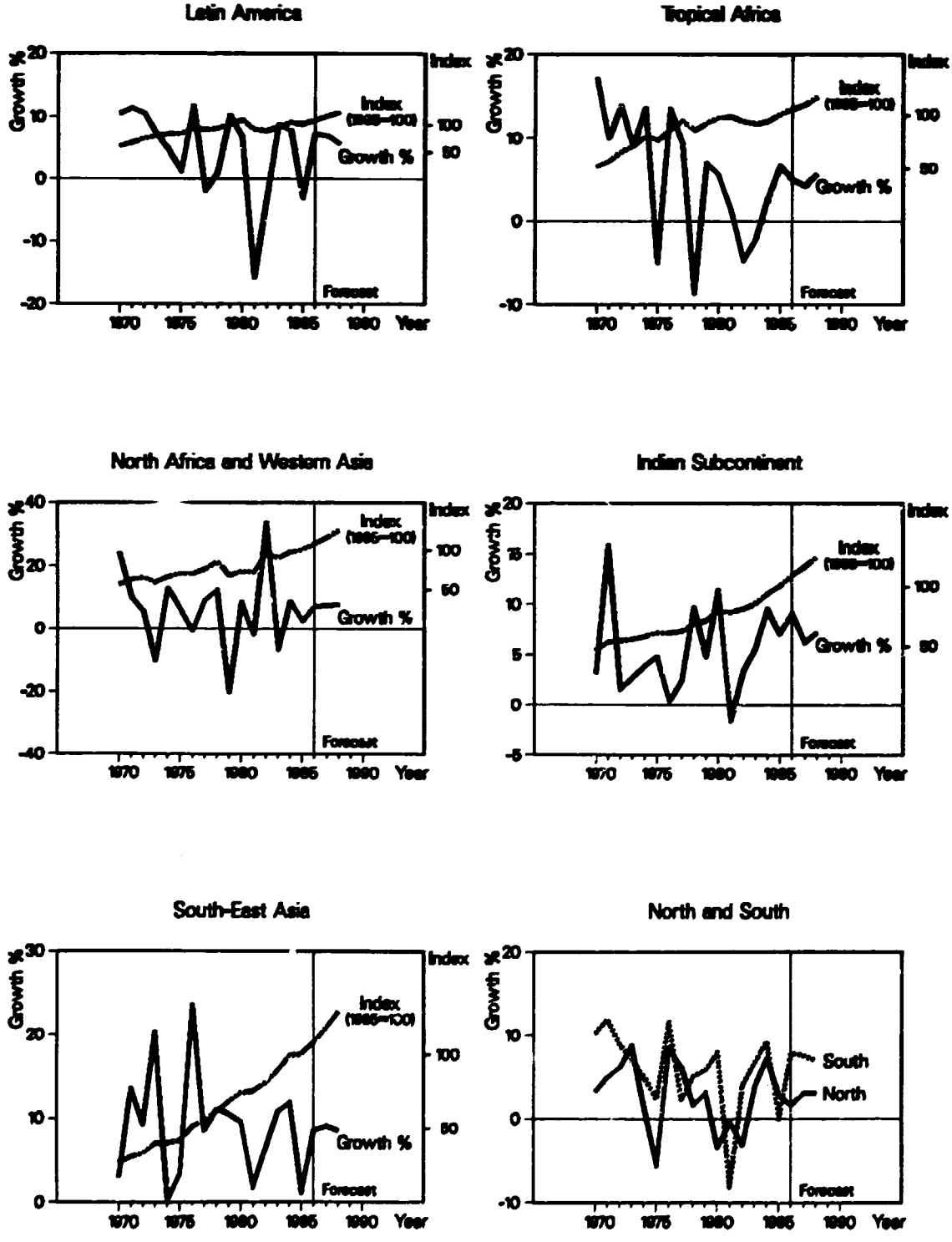
Tyres, tubes for automobiles, trucks, aircraft, tractors etc.

Other rubber products

(a) *Present situation*

The rubber products industry makes a small contribution to manufacturing output in developed countries, accounting for 0.9 per cent in Japan, 1.3 per cent in North America and 1.6 per cent in Eastern Europe and the USSR. In developing countries, its contribution is highest at 2.1 per cent in South-East Asia, a region producing natural rubber, and for all regions averages 1.8 per cent.

Figure XXXIV. Rubber products (ISIC 355)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SP/GLO.

Between 1970 and 1985, output increased twice as fast in developing countries as in developed countries (5.2 per cent versus 2.7 per cent per annum). As a result, the share of developing countries in world output increased from 10.9 per cent in 1970 to 15.0 per cent in 1985 on the basis of a sample of 82 countries, or from 12.3 to 16.4 per cent on the basis of data from 165 countries (see figure XXXIV for regional trends).

In developing countries, about 70 per cent of the output of the industry consists of tyres and tubes for motor vehicles, and the remaining 30 per cent of other rubber products; in developed countries the proportions are about 60 per cent and 40 per cent, respectively. Tyres for commercial vehicles account for more than a third of total output of tyres in developing countries and about 15 per cent in developed countries. Tyres for commercial vehicles use much greater quantities of natural and synthetic rubber than tyres for passenger cars.

Demand for tyres for most types of motor vehicles has been reduced by the introduction of radial tyres with a longer life. Output in North America and Western Europe has yet to regain the peak levels reached in 1979 and 1980. In Japan and Asian developing countries, tyre output increased by 25 per cent between 1978 and 1983 and has continued to expand. In Latin America, production of tyres for commercial vehicles has grown steadily, whereas output of tyres for passenger cars peaked in 1980 and has yet to regain the high level reached in that year.

Demand for other rubber products depends mainly on inter-industry trade rather than consumers. Demand in developing countries reflects the stage of development reached in the automobile industry and in manufacturing other products required by the engineering industry. The value of shipments of fabricated rubber products in the United States in 1985 is shown in table 75.

Restructuring is taking place in this industry both on a world scale and within individual countries. In 1985, imports took 20 per cent of the United States' tyre market; Asia accounted for 44 per cent of these imports. Between 1977 and 1985, employment in the United States rubber tyre and inner tubes industry fell from 114,000 to 66,500 persons. A total of 20 older tyre plants were closed, and over $300 million was invested in modernizing tyre plants. However, the industry acknowledged that tyre production has not yet become a fully automated production process.

Developing countries export rubber footwear and footwear with rubber soles to developed countries in substantial volume. Malaysia has developed exports of rubber boots, surgical gloves and other rubber products. The United States became a net importer of rubber hose and belting in 1985, with significant imports from Taiwan Province. Other fabricated rubber products are traded internationally to a smaller extent.

Table 75. Shipments of other rubber goods in the United States in 1985

Product	*Value (millions of dollars)*
Hose	1 160
Flat belts	295
V-belts	525
Sponge and foam	567
Floor covering	339
Shoe products	272
Medical sundries	574
Rubber compounds	743
Moulded rubber products	1 877
Extruded rubber products	558
Industrial rubber products	709
Coated fabrics	390
Other rubber goods	707
Miscellaneous products	339
Total	9 055

Source: Department of Commerce [70].

(b) *Future prospects*

The output of rubber products in developing countries is expected to increase by 7.5 per cent in 1987 and 6.9 per cent in 1988. In developed countries, output is expected to increase by 3.2 per cent in 1987 and 3.3 per cent in 1988.

Fast growth of output is expected in the Indian Subcontinent (6.1 per cent in 1987 and 7.2 per cent in 1988), in South-East Asia (8 per cent and 7.4 per cent) and in Western Asia (8.2 per cent in both 1987 and 1988). In Latin America, further recovery in output is expected with gains of 6.9 per cent in 1987 and 5.6 per cent in 1988. In North Africa, forecast output increases are 2.7 per cent in 1987 and 3.2 per cent in 1988. In Tropical Africa, the outlook is for steady growth of 4.5 per cent in 1987 and 5.7 per cent in 1988.

The demand for tyres and tubes is subject to different influences. Demand is reduced as the quality of tyres is improved; the growing stock of motor vehicles increases replacement demand; and tyres used in the assembly of new motor vehicles is another important element in demand.

The long-term outlook is for steady growth of the rubber products industry in developing countries (see table 76). Developing countries with an established rubber products industry and resources of natural rubber will expand production. A wider range of developing countries will embark on production of rubber products, at first concentrating on rubber tyres and tubes, including tyres and tubes of bicycles, mopeds and motor bicycles.

In developed countries, the structure of the industry will be further rationalized so that a small number of transnational corporations and national producers remain. Restructuring in the early 1980s was forced by persistent losses; the industry has been restored to

Table 76. Forecast consumption of rubber by region in 1986 and 1991

Region	*Consumption in thousands of tonnes*		*Percentage rate of increase, 1986-1991*
	1986	*1991*	
North America	2 848	2 912	2.3
Western Europe	2 397	2 546	6.2
Latin America	783	939	19.9
Asia and Oceania	2 684	3 049	13.6
Africa and Western Asia	232	278	19.6

Source: International Institute of Synthetic Rubber Producers [119].

Table 77. Selected UNIDO technical co-operation projects related to the rubber products industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Burma	UNDP	1982—	Development Centre for Rubber Technology
China	COFN*	1981—	Rubber research and development centre
Democratic Yemen	UNDP	1985—	Rubber products manufacturing adviser
Papua New Guinea	COFN*	1978—	Rubber industry development
Romania	UNDP	1984—	Assistance in the manufacture of radial car tyres and tubeless radial truck tyres
Global	IDF	1981-1986	Development of liquid natural rubber
	IDF**	1985—	Development of the application of liquid natural rubber
Interregional	IDF**	1980—	Development of industrial composite materials based on natural rubber

For footnotes see table 46.

profitability in North America and Western Europe by cutting costs and closing down surplus capacity.

Hence the industry is now ready for the next stage, the introduction of automation in the manufacturing process. In 1986, the world's largest tyre producer (Goodyear) purchased from a company that has reduced its world-wide involvement in tyre production (Dunlop Rubber) its specialized group on computerized control of the manufacturing process.

(c) *UNIDO activities*

UNIDO technical co-operation has concentrated on developing the use of natural rubber products by developing countries. One of the most important of UNIDO's global projects, started in 1980, dealt with the development of industrial composite materials based on national rubber. A project in Papua New Guinea has helped the development of the rubber industry. Another global project, started in 1985, dealt with the development of the application of liquid natural rubber. In China, where demand for rubber is growing rapidly, UNIDO assisted the Rubber Research and Development Centre (see table 77).

17. Plastic products (ISIC 356)

Moulding, extruding, fabricating plastic articles
Plastic bottles, footwear, furniture etc.

(a) *Present situation*

The plastic products industry share of total manufacturing output is 1.85 per cent in developed countries and 2.05 per cent in developing countries. Between 1970 and 1985, output of this industry increased faster in developing countries than in developed countries (7.3 per cent versus 5.3 per cent per annum). As a result, the developing countries share of world output in this industry increased between 1970 and 1985 from 10.2 to 12.7 per cent on the basis of a sample of 82 countries, or from 11.5 to 13.8 per cent on the basis of data from 165 countries (see figure XXXV for regional trends).

The use of plastics is at an early stage of development in many developing countries, hence rapid rates of output growth are expected in the coming years. In developing countries, demand for the five plastics used in largest volume increased from a low base level in 1970 by almost 15 per cent per annum in the 1970s and by 10 per cent per annum between 1980 and 1984. Between 1984 and 1990, growth is expected to average 9.2 per cent per annum.

Polyvinyl chloride (PVC) is the plastic used in largest volume in developing countries. Rapid PVC is used for pipe and conduit, for extruded profiles, for film and sheets, and for blow-moulded plastic bottles. PVC is also used to cover wire and cable, in coated fabrics and in making floor coverings.

Low-density polyethylene (LDPE) is used in almost as great a quantity as PVC in developing countries. About 75 per cent is converted into film and sheets. Developing countries are already using LDPE film in agriculture in large quantities, and UNIDO is promoting further growth in agricultural end-uses. The availability of linear low-density polyethylene will expand the use of this plastic.

Polypropylene is the fastest-growing plastic used in developed countries and a world shortage of supply appears likely before 1990. It is less widely used in developing countries but demand is likely to grow faster in the future. Half the output of polypropylene is used for injection moulding, about 10 per cent for extrusion and about 15 per cent for fibres.

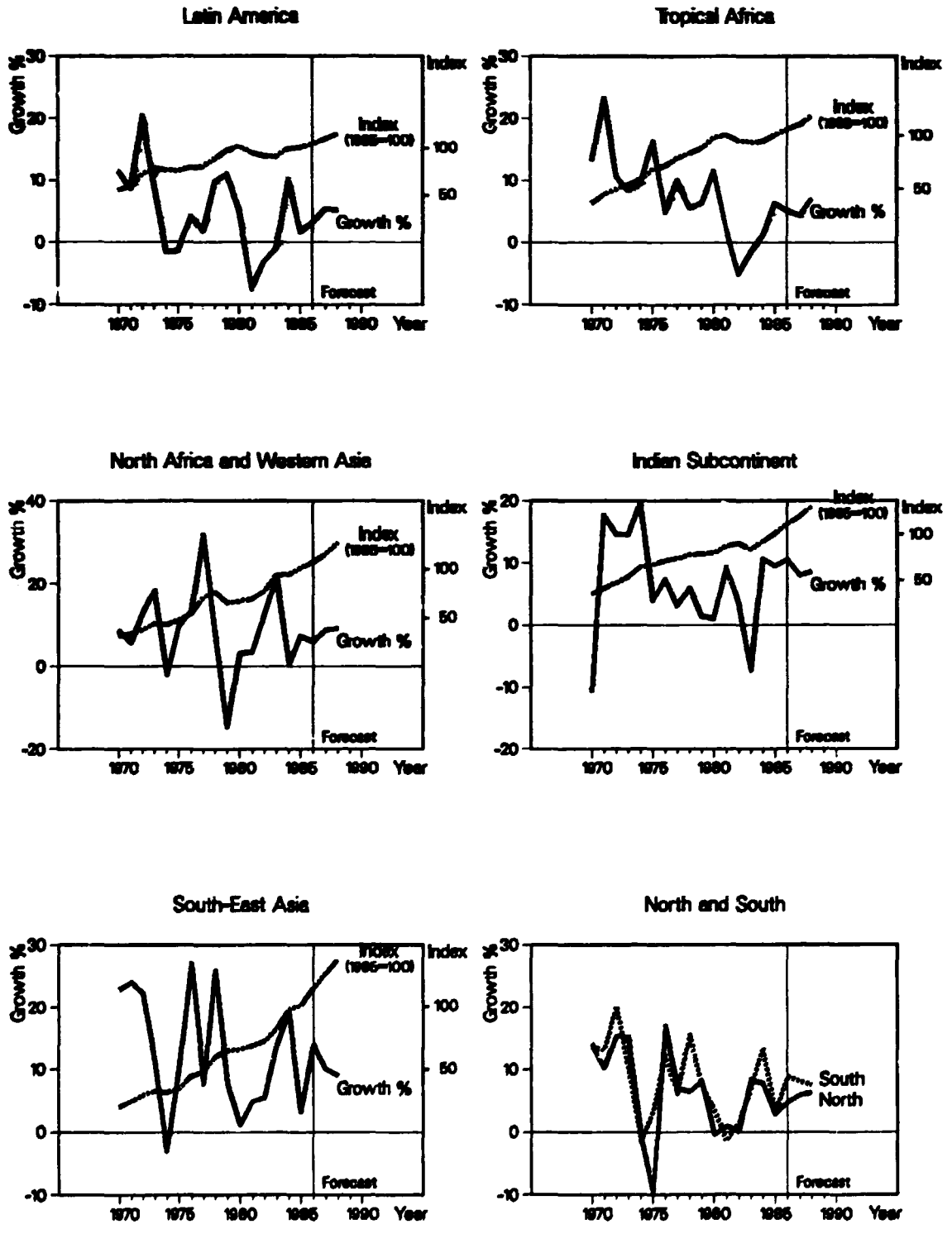
High-density polyethylene (HDPE) is used in roughly the same quantities as polypropylene in developing countries. HDPE is suitable for blow-moulding, mainly in the form of bottles; it is also used for injection moulding, film binding tape, pipes etc.

Polystyrene is the plastic used in the lowest volume at present in developing countries. It is mainly used for packaging, plastic paints, household goods, household appliances and toys.

A very wide range of plastic products is produced from these five major plastics as well as other plastics such as ABS, nylon, polyester, PET and melamine. In addition to these, a fast-growing area for plastics in developed countries is that of the so-called "engineering plastics" that have physical qualities similar to metal.

One area for greater use of plastics is plastic bottles. In the United States production rose from 12 billion

Figure XXXV. Plastic products (ISIC 356)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

units in 1978 to 18 billion units in 1987. Beverages account for 5 billion of the total, other uses are for milk, food, household chemicals etc. About two thirds of the bottles are made from HDPE and 23 per cent from PET.

In developing countries, few plastic processing enterprises have been established on a large scale; the majority are small-scale units scattered in different geographical locations. The skills required to enter the industry are mainly in the making of moulds. It is an industry that can be established in rural areas.

(b) *Future prospects*

Output of the plastic products industry is expected to increase by 8 per cent in 1987 and 7.5 per cent in 1988 in developing countries, and by 6 per cent in 1987 and 6.4 per cent in 1988 in developed countries.

Rapid growth in this industry is expected in the Indian Subcontinent (7.5 per cent in 1987 and 8 per cent in 1988), in South-East Asia (10 per cent in 1987 and 9 per cent in 1988), in North Africa (6.8 per cent in 1987 and 7 per cent in 1988) and in Western Asia (9.2 per cent in 1987 and 9.6 per cent in 1988). Slower growth is forecast for Latin America (5.3 per cent in 1987 and 5.1 per cent in 1988). Plastic products are expected to be one of the fastest-growing industries in Tropical Africa (5.3 per cent in 1987 and 7.1 per cent in 1988).

The plastic products industry is likely to remain a fast-growing industry in developing countries for several years to come. Per capita consumption of plastics is still very low in some developing regions, amounting to 1 kilogram in Tropical Africa and 3.5 kilograms in North Africa and Western Asia. UNIDO projects growth of demand for plastics averaging 9 per cent per annum from 1984 to 1990. In the 1990s, growth rates may slow down a little, as was the experience in developed countries in the late 1970s.

There has been a steady stream of improvements in the machinery used to produce plastic products. Computers are used to make high-precision moulds and dies. Moulding and blow-moulding machines are highly automated.

(c) *UNIDO activities*

UNIDO training programmes on plastics technology and mould-making have helped to develop skills needed to establish and expand this industry in a wide range of developing countries. In Guinea-Bissau, an on-the-spot assessment of the industry and its potential has been made (see table 78).

The UNIDO programme includes the establishment of a plastics development centre for agricultural purposes in Egypt. UNIDO has promoted the development of the plastics processing industry in Arab countries through a project at the regional level. In China, UNIDO has provided assistance for making dies and moulds for plastic products and for recycling plastic waste. UNIDO assistance has been provided for the manufacture of polyethylene water pipes in Bhutan, and for research on the development and application of rigid PVC products in China. In 1985, the UNIDO investment promotion service provided a small investment in a plant manufacturing plastic bottles in Malawi.

Table 78. Selected UNIDO technical co-operation projects related to the plastic products industry

Region, country or area	*Source of funds*[a]	*Executing period*[b]	*Project title*[c]
Bangladesh	UNDP*	1981—	Pilot plastics processing, testing, training and information centre
Bhutan	UNDP*	1983—	Polyethylene pipe manufacture
China	IDF	1983-1986	Recycling of solid plastics waste
	COFN	1985—	Preparation of projects for CP II; preparation assistance for die and mould production
	UNDP**	1985—	Development and applications research—rigid PVC products
	IDF*	1986—	Recycling system for plastics waste
Democratic People's Republic of Korea	UNDP	1983—	Assistance in the production and processing of PVC
Egypt	UNDP*	1981—	Plastics development centre for agricultural purposes
Guinea-Bissau	UNDP	1986—	Assessment of the present status and future plans of the plastics processing industry
India	UNDP	1981—	Development of resins, moulding compounds, curing agents etc. for use in the composites industry
	UNDP**	1982—	Plastics material and product testing programme
Iraq	UNDP	1985-1986	Assistance to the plastic and paint industry
Mexico	UNDP*	1978—	Plastics in agriculture
Pakistan	UNDP*	1984—	Plastics technology centre
Interregional	IDF	1985-1986	Sixteenth In-Plant Group Training Programme in the field of plastics technology Vienna, 30 September-8 November 1985
	IDF	1985-1986	Sixteenth In-Plant Group Training Programme in the field of mould-making of plastics, Vienna, 11 November-6 December 1985
	IDF	1986—	In-Plant Group Training Programme in the field of mould-making of plastics, Vienna, 17 November-12 December 1986

For footnotes see table 46.

18. Pottery, china and earthenware (ISIC 361)

China tableware and kitchenware
Bathroom and other ceramic fittings
Stoneware, earthenware pots

(a) *Present situation*

This industry contributes 0.46 per cent of total manufacturing output in both developed and developing countries. Between 1970 and 1985, output increased by 3.9 per cent per annum in developing countries and 2.2 per cent per annum in developed countries. As a result, the developing countries' share of world output rose from 9.5 to 11.8 per cent on the basis of a sample of 82 countries, or from 10.7 to 12.9 per cent on the basis of data from 165 countries (see figure XXXVI for regional trends).

Although the production of china tableware and pottery was formerly carried out by handicraftsmen in most developing countries, it now accounts for a growing share of industrial output as small-scale facilities have been replaced by modern plants with large drying kilns. The production of ceramic sanitary fittings (baths, wash basins and toilets) is the major part of the industry's output in most countries. There is some scope for a wider range of developing countries to establish modern production facilities for sanitary ware.

Tableware and pottery are traded internationally on a small scale. The leading exporters of expensive porcelain tableware are the Federal Republic of Germany, Japan and the United Kingdom. There is little international trade in this range of products because they are fragile and heavy. There have been a few technological innovations in the industry. The required skills include analysing local raw materials and selecting and refining those suitable for use in ceramics.

In developed countries, there is a well-established and slowly growing demand for the traditional products of the industry. The main emphasis of the industry is on developing new ceramics with special properties, such as heat and wear resistance, superior to those of plastics and metals.

The original heat engine ceramic, the spark-plug insulator, has been joined by a large number of ceramic structural components used in a variety of engine types such as gas turbine and diesel engines. The ceramic components are used in these engines to increase thermodynamic efficiency by enabling the engines to operate at a higher temperature. Not only must the ceramics used for the components be refractory, but they must also have high strength, toughness, and be thermal-shock-resistant. The ceramic materials most commonly used for these applications are silicon nitride, silicon carbide, zirconia, glass ceramics and oxide coatings. The incorporation of brittle ceramics in the engine in place of more ductile metals has required a new approach in engine design based on the collaboration of designers and ceramists.

(b) *Future prospects*

The output of the ceramics industry is expected to increase by 4.4 per cent in 1987 and 6.2 per cent in 1988 in developing countries, and by 3 per cent in 1987 and 3.1 per cent in 1988 in developed countries. The emergence of new ceramic products could lead to faster growth in developed countries than past trends suggest.

In Latin America output declined between 1980 and 1985; the forecast growth of output is 4 per cent in 1987 and 5.3 per cent in 1988. Output in South-East Asia is expected to grow very fast (9.5 per cent in 1987 and 8.7 per cent in 1988). A cyclical pattern of growth is forecast for the Indian Subcontinent (−1 per cent in 1987 and +3.2 per cent in 1988) and Western Asia (0.5 per cent in 1987 and 6.3 per cent in 1988). In North Africa, a rapid growth is forecast (8.3 per cent in 1987 and 7.1 per cent in 1988). In Tropical Africa, output is expected to recover (3.1 per cent in 1987 and 3.8 per cent in 1988).

Most developing countries will need growing quantities of ceramics for the traditional uses—household porcelain and china, ceramic sanitary ware, insulators and refractories. Those countries with a broad industrial base will find use for some of the new ceramics, in particular in refractories, insulators in the electronics industry and perhaps eventually in moving parts of internal combustion engines.

In developed countries, a huge research and development effort is being devoted to the new uses of ceramics. This will lead to a major expansion of the industry. For example, the use of ceramics in the electronics industry in Japan is expected to triple in the 1980s to over $3 billion in 1990. The largest traditional use of ceramics is in insulators, capacitors and resistors; the fast-growing new uses are in magnetics, transducers, integrated circuits, semi-conductors, ferrites for microwave ovens and ceramic sensors ([122], [123]).

The other new use, engineering ceramics, is expected to develop from zero to a market of $2 billion to $3 billion in Japan in 1990. The lower figure will prevail if engineering ceramics are used as widely as possible in the current engine structure. The higher figure could be reached if an all-ceramic diesel engine is produced and installed in half the motor vehicles producing power with diesel engines. Added to this would be the traditional use of ceramics in spark-plugs and electronics.

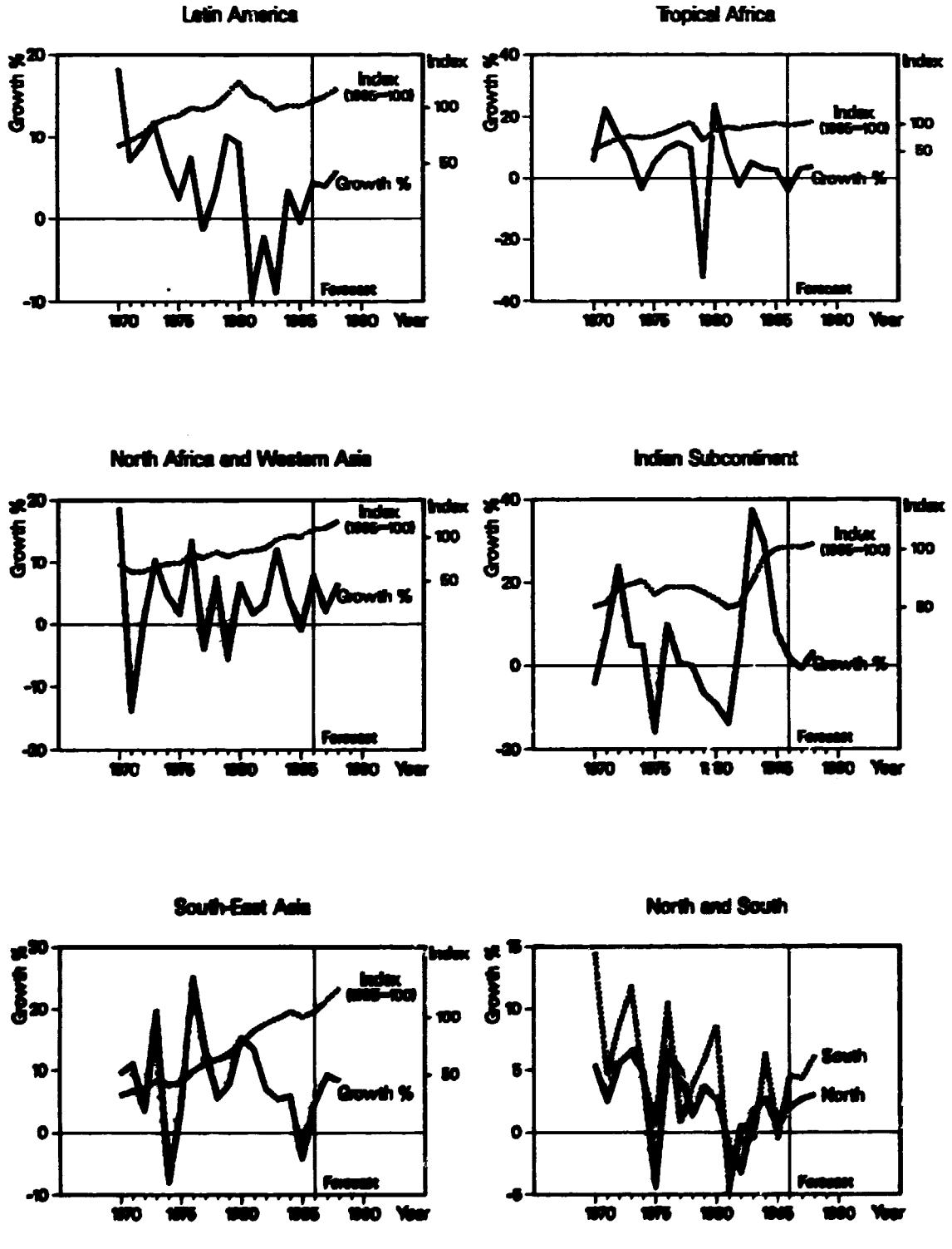
In the United States, market surveys estimate demand for advanced ceramic products (including heat-engine components, integrated optic devices, sensors and cutting tools) at $10 billion by the year 2000.*

(c) *UNIDO activities*

UNIDO assists developing countries in evaluating their clay and other raw material resources and developing local ceramic industries based on them. Democratic Yemen has been helped to utilize its heavy clay for ceramics. Two UNIDO projects have brought improvements to the pottery and ceramics industry in

*The estimate was made by James I. Mueller, Professor of Ceramic Engineering at the University of Washington and President of the United States Advanced Ceramic Association, at the first meeting of the Association's Board of Directors, October 1985, as quoted in "USACA outlines steps for commercialization", *Ceramic Bulletin*, vol. 64, No. 12 (1985).

Figure XXXVI. Pottery, china and earthenware (ISIC 361)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/PPD.

Table 79. Selected UNIDO technical co-operation projects related to the pottery, china and earthenware industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Bolivia	OTD	1980—	Upgrading of the technologies used by women potters
	IDF	1985—	Mejoramiento de la tecnologia de cerámica en Huayouli
China	UNDP	1985—	Technical development of architectural sanitary ceramics
Democratic Yemen	IDF	1983—	Assistance to heavy clay and ceramic industries
Ethiopia	UNDP	1985-1986	Assistance to the Ethiopian Electricity, Light and Power Authority in ceramic technology
Mongolia	UNDP	1986—	Assistance in the development of ceramic handicraft
Netherlands Antilles	UNDP*	1983-1986	Ceramic tile manufacturing
Sri Lanka	IDF**	1978—	Establishment of a ceramic research and development laboratory
	UNDP	1986—	Ceramic research laboratory
Interregional	UNDP	1986	Joint programme for international co-operation in the field of ceramics building materials and non-metallic mineral-based industries

For footnotes see table 46.

the rural areas of Bolivia and Mongolia. China has been assisted in the technical development of sanitary ceramic ware. The production of ceramic insulators has been assisted in Viet Nam. A ceramics research laboratory established in Sri Lanka may produce findings useful to other developing countries (see table 79).

19. Glass and glass products (ISIC 362)

Glass containers
Sheet glass
Glass fibres
Other glass products

(a) *Present situation*

The glass industry is a small industry contributing 0.88 per cent to total manufacturing output in both developed and developing countries. Between 1970 and 1985, its output increased by 4.5 per cent per annum in developing countries and 2.9 per cent in developed countries. As a result, the share of developing countries in world output of this industry increased between 1970 and 1985 from 9.9 to 12.1 per cent on the basis of a sample of 82 countries, or from 11.2 to 13.3 per cent on the basis of data from 165 countries (see figure XXXVII for regional trends).

In developed countries, the glass container branch of the industry has faced reduced levels of demand due to competition from plastic bottles; it has been forced to restructure and modernize production facilities. For example, in the United States, the number of plants producing glass containers has fallen from 134 to 94 and the number of operating lines has dropped from 900 to 600. The industry is now operating at better rates of capacity, but the underlying problem of competitive forms of packaging remains. The market for glass containers replaced by plastic containers cannot be recovered; the industry remains highly dependent on containers for soft drinks and beer.

In developed countries, demand for flat glass (sheet glass) tends to follow the trend in GDP with a time lag of about six months. It is strongly influenced by the level of new housing construction and the level of activity in the construction and motor vehicle industries. Thus, the production of flat glass recovered modestly in the United States, Western Europe and Japan in 1986.

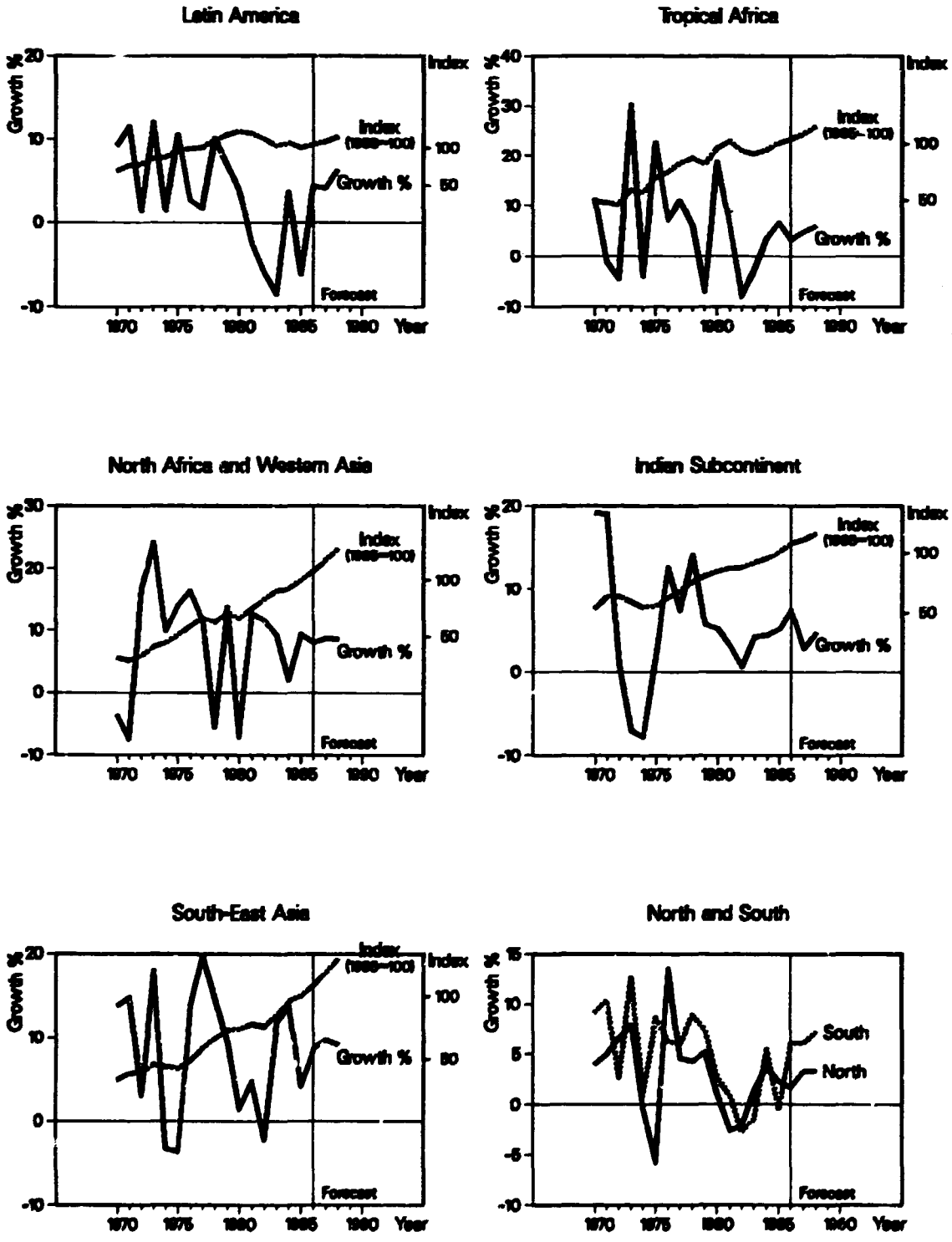
The wider introduction of the float-glass process in the early 1970s made it possible to produce and use thinner sheets of glass. Output measured by weight is therefore not a good guide to the volume of glass output measured by area. In terms of weight, United States output reached a peak in 1978, fell steadily to a level in 1982 that was 22.5 per cent below the 1978 level, then recovered sharply in 1983 and 1984 to a level just below that of 1978. Output in 1985 and 1986 was only 1 or 2 per cent higher than in 1984. In Eastern Europe and the USSR, the weight of flat glass produced in 1984 was no higher than in 1975. Insufficient data is reported to the United Nations to estimate glass production in Western European countries.

There are a few developing countries that report physical output of glass containers. In Mexico, output increased by 50 per cent between 1976 and 1980 but then fell back sharply. In the Republic of Korea, output was up 200 per cent between 1977 and 1984 when the economy grew rapidly. Since output for glass containers is mainly for the soft drinks and beer industries, rapid rates of growth should continue in most developing countries.

As a result, the developing countries' share of world output rose from 9.9 per cent in 1970 to 12.1 per cent in 1985. A start in the glass industry is usually made in a developing country with a plant to produce glass bottles and other containers. Glass production plants must operate continously, 365 days a year and 24 hours a day. They require careful planning as regards the market, source of technology, choice of site and raw materials and selection of equipment. Capital cost for a minimal size glass container plant with two forming machines and output of 30-35 tonnes per day has been put at $8 million. Such a plant would employ 120 workers who would require extensive training [124].

The output of the seven largest producers of sheet glass among developing countries in 1975, 1980 and

Figure XXXVII. Glass and glass products (ISIC 362)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SPR/GLO.

1984 is shown in table 80. The data suggest that output is sensitive to any recession in the economy but can otherwise be expected to increase between 50 per cent and 100 per cent over a period of 10 years.

(b) *Future prospects*

The output of the glass and glass products industry in developing countries is expected to increase by 6.1 per cent in 1987 and 7.2 per cent in 1988. Output in developed countries is forecast to increase by 3.5 per cent in both 1987 and 1988.

Among developing regions, Latin America accounts for 50 per cent of the output and its output growth is expected to be 4.1 per cent in 1987 and 6.2 per cent in 1988. Demand is growing faster in South-East Asia and output is expected to be up by 9.9 per cent in 1987 and 9.3 per cent in 1988. For Western Asia, construction activity is expected to recover, boosting output by 8.9 per cent in both 1987 and 1988. A cyclical pattern is reflected in forecasts for the Indian Subcontinent (2.7 per cent in 1987 and 4.7 per cent in 1988). For North Africa, less rapid growth is forecast (6.6 per cent in 1987 and 6.1 per cent in 1988). For Tropical Africa, the main output is glass containers for the beer and soft drinks industry; an increase in output of 5.5 per cent in 1987 and 6.3 per cent in 1988 is forecast.

Demand for glass containers in developing countries will continue to grow rapidly since they are used mainly by the soft drinks and pharmaceuticals industries, two of the fastest-growing industries. Demand for sheet glass reflects the level of activity in the building and construction industries and to a lesser extent in the automobile industry. At present, the construction industry is depressed in several countries in South-East Asia, Tropical Africa and Latin America, but in the long term demand will revive and developing countries will need to increase the number of plants making sheet glass.

Developing countries need to extend the types of sheet glass that they manufacture. At present there are only a few producers of toughened safety glass for glass windscreens of motor vehicles. In terms of weight, flat glass is the largest part of the industry's output. Major products of the flat glass industry include float, plate, tempered and laminated glass. Float glass is made by floating fused glass on molten metal to provide a uniform thickness and width that is free from distortion. Plate glass is first rolled, then ground and polished on both sides. Tempered glass is flat glass that has been toughened by being heated above its strain point and then quickly cooled. Laminated glass consists of plates of glass bonded to each side of a sheet of plastic to provide protection against shattering.

A recent important technological development in the glass industry is low-E flat glass which embodies a new concept—clear insulation. Ordinary glass transmits two types of heat, the short wavelength energy from the sun and the long wavelength energy created when the short waves strike a solid object and are re-radiated as infrared heat. The new low-E glass is transparent to short wavelength energy but is largely reflective to long wavelength energy. This coated glass allows most of the sun's heat and light to pass through the window and more efficiently reduces heat loss from the building to the outside.

As regards technological advances in the glass manufacturing process, there has not been any development as revolutionary as the float glass process which did away with the need to grind and polish sheets of glass. Glass-making is an energy-intensive process and great efforts have been made to produce more efficient furnaces burning gas or oil. Another major field of research is concerned with ways to make glass containers stronger [125].

Table 80. Production of flat glass in various developing countries, 1975, 1980 and 1984

(Millions of metric tonnes)

Country	1975	1980	1984
Brazil	21.15	29.12	...
Chile	1.57	1.97	2.10
India	14.26	23.15	25.80
Indonesia	...	14.30	23.34[a]
Mexico	23.71	31.29	21.55
Republic of Korea	15.51	28.69	...
Turkey	11.42	11.06	...

Source: United Nations [62].

[a] 1983 figure.

(c) *UNIDO activities*

UNIDO has advised on the establishment of plant manufacturing sheet glass and glass containers. The technical co-operation projects operating or newly initiated in 1986 are listed in table 81. As in other industries, one of the most important programmes is in China, where the industry is growing rapidly. The UNIDO Investment Promotion Service in 1985 promoted investment of $4.7 million in a glass container plant in Malawi and investment of $10 million in a glass fibre plant in China.

Table 81. Selected UNIDO technical co-operation projects related to the glass and glass products industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Bangladesh	UNDP*	1983—	Assistance to glass factories
China	UNDP*	1981—	Assistance to glass development centre
	UNDP*	1985—	Research and development for improving building-glass technology
Honduras	UNDP*	1986—	Assistance to the glass factory Ferrovidrio

For footnotes see table 46.

20. *Other non-metal mineral products (ISIC 369)*

Bricks, tiles, pipes
Cement, lime, plaster
Other building materials

(a) *Present situation*

This industry contributes 4.1 per cent of total manufacturing output in developing countries and 2.6 per cent in developed countries. Between 1970 and 1985 output increased more than three times as fast in developing countries as in developed countries (5.7 versus 1.7 per cent per annum). As a result, the developing countries' share of world industrial output increased from 10.3 per cent in 1970 to 16.9 per cent in 1985 on the basis of a sample of 82 countries, or from 11.7 to 18.6 per cent on the basis of data from 165 countries (see figure XXXVIII for regional trends).

Cement is the most important building material produced by this industry. Fired or unfired clay products such as bricks, roof tiles, floor tiles and wall tiles are used in many countries. They are suitable for rural areas because they require simpler and less capital-intensive manufacturing processes.

World output of cement increased by 3.5 per cent in 1983 and 2.4 per cent in 1984, when it reached 939 million tonnes [126]. World trade in cement reached a peak of 80 million tonnes in 1983 and fell back in 1984 and 1985. The world's largest exporters of cement in 1984 were Japan (12 million tonnes), Spain (10 million tonnes), Greece (7 million tonnes), Taiwan Province (3.6 million tonnes), Republic of Korea (3.1 million tonnes) and Mexico (2.1 million tonnes). The largest importers in 1984 were Saudi Arabia (12 million tonnes), Egypt (9 million tonnes), Hong Kong (3.4 million tonnes) and Algeria (1.9 million tonnes).

The world cement industry has excess capacity and prices have been low in recent years in most markets. Profitability was improved by lower energy costs in 1986, and prices are expected to remain at low levels in most markets in 1987 and 1988. In the United States, in November 1986, the industry claimed that imports were being sold at prices below fair market value.

The cement industry is growing fastest in Egypt, China and India. The most rapid expansion of cement production capacity is under way in Egypt, where production increased from 6.5 million tonnes in 1984 to almost 8 million tonnes in 1986; by 1990, cement production capacity is expected to reach 20 million tonnes, enough to make the country self-sufficient [127]. In 1985, five large new kilns went into operation, and at the end of the year new projects with a total capacity of an additional 4 million tonnes were under construction. During 1985 contracts for the supply of equipment for a further five cement manufacturing plants were signed. This very rapid expansion has temporarily strained the existing cement manufacturers' financial and management resources. A plant producing 1.4 million tonnes per year at Quattamia, which began production in 1986, was financed by the International Finance Corporation and loans from the United States Government and from Swiss banks. Holderbank Management and Consulting Limited provided training for personnel and technical management for the plant. But for most of the other projects, Egypt has relied on its own resources.

China hopes to increase cement production from 121 million tonnes in 1984 to 200 million tonnes in 2000 [128]. To achieve this, there are plans to build each year over the next 15 years two new high-technology 600,000 tonnes-per-year production units and some mini-plants in each major geographic region. Cement plant equipment will be built by Chaoyang Heavy Machinery Works with co-operation from Japan's Kawasaki Heavy Industries, in an agreement which calls for the Japanese company to send technical experts to China as well as provide design drawings to the Chinese for an energy-saving cement manufacturing plant. Using the drawings, China's Liaoning province will produce the equipment and sell the complete plants to provinces throughout China.

India plans to increase cement production by 6 per cent per annum from 37.3 million tonnes in 1985-1986 to 50.8 million tonnes in 1989-1990, a level of output that will be double the 25.4 million tonnes produced in 1983. In addition to constructing medium- and large-scale cement plants, India continues to build mini-plants. The existing 20 mini-plants with an annual capacity of 4.5 million tonnes will be supplemented by a further 30 mini-plants with a capacity of 10 million tonnes, scheduled to come on stream in 1986 and 1987. A Working Group on the Cement Industry has identified technological objectives such as the adoption of precalciners, conversion of wet-process plants to dry-process, energy conservation, quality control and bulk distribution.*

Indonesia's cement production capacity increased by about 50 per cent, or 5 million tonnes, in 1985, but local demand then weakened. Exports increased in 1985 and 1986. Plans for the expansion and construction of new cement plants were postponed until 1988.

In Latin America, cement production fell sharply after reaching a peak in 1982. Brazil's output dropped by 25 million to 200 million tonnes between 1982 and 1985, when utilization of capacity was 50 per cent, but demand recovered in 1986. The output of other countries in Latin America has been stagnant, and new investment in expansion has generally waited on a revival of demand.

In Africa, production has been increasing slowly. The largest producers are Algeria (where production increased by 20 per cent between 1982 and 1984), Morocco and Nigeria (where lower demand has reduced the latter country's high dependence on imports).

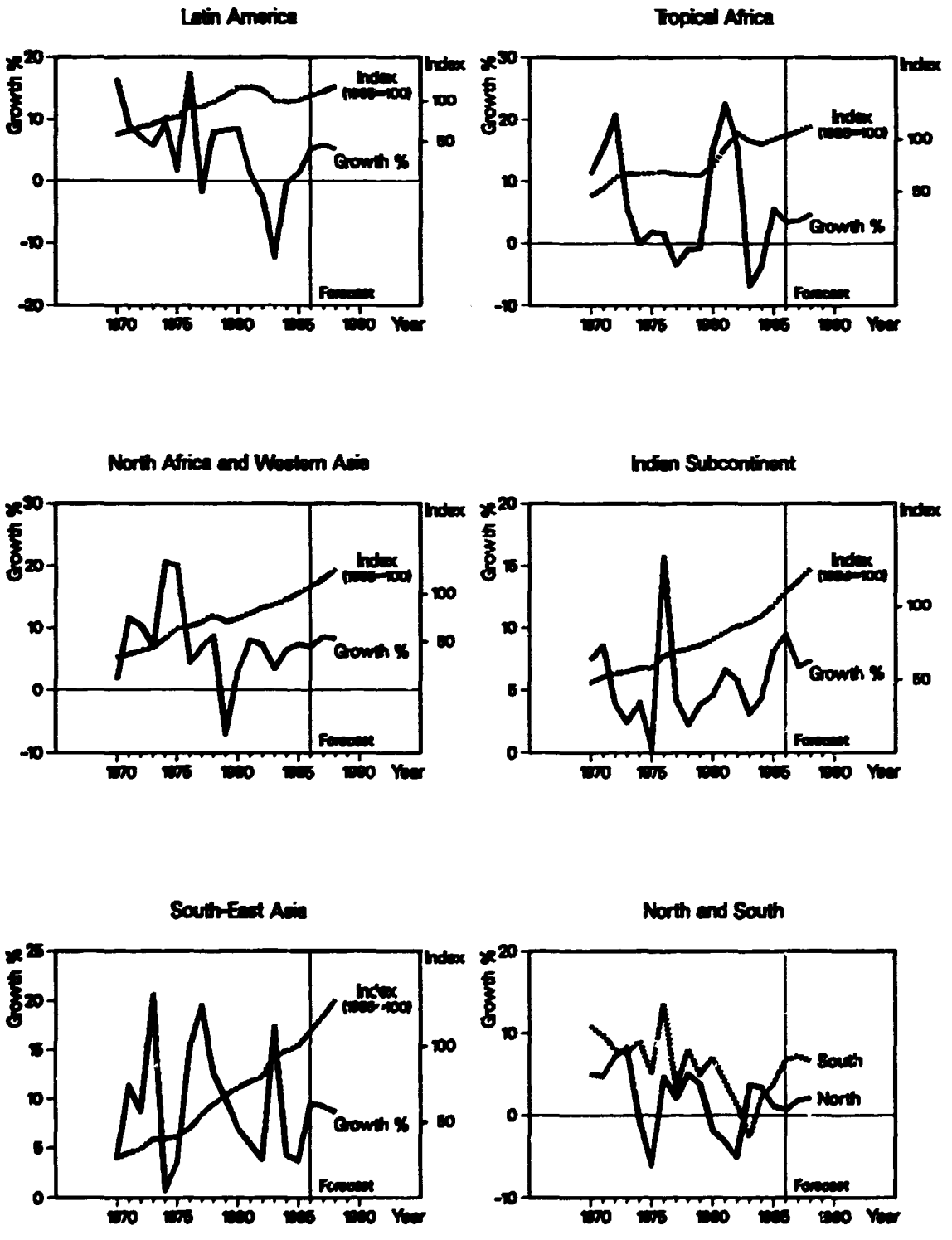
(b) *Future prospects*

The output of cement and other building products in developing countries is expected to grow by 7.3 per cent in 1987 and 6.9 per cent in 1988. In developed countries, output of this industry is expected to increase by 2.0 per cent in 1987 and 2.3 per cent in 1988.

Output of the building materials industry is expected to grow very rapidly in East and South-East Asia

*According to a statement by S. K. Khanna, quoted in *Rock Products*, April 1986.

Figure XXXVIII. Other non-metal mineral products (ISIC 369)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/IPR/GLO.

(9.6 per cent in 1987 and 9 per cent in 1988) and in Western Asia (8.8 per cent in 1987 and 8.9 per cent in 1988) and North Africa (7.1 per cent in 1987 and 5.1 per cent in 1988). Output in Latin America in 1985 was still below the 1980 level, but a further recovery in output is forecast (5.8 per cent in 1987 and 5.1 per cent in 1988). After falling in 1983 and 1984, output in Tropical Africa will continue its recovery (4 per cent in 1987 and 4.8 per cent in 1988).

Since most developing countries attach a high priority to developing their infrastructure of buildings and roads, steadily increasing quantities of building materials will be required. The rate of growth of construction programmes is likely to match at least the growth of GDP. In some least developed countries, construction will be the leading sector, growing substantially faster than GDP.

The technology for manufacturing cement is widely available from equipment manufacturers. There are also a few transnational corporations active in production in developing countries or selling consulting and training programmes to them. The main obstacle to rapid expansion of the industry in some developing countries is the lack of experience in the selection of technology and the training of manpower. International co-operation will therefore continue to be requested by some new enterprises in those countries.

The most interesting changes in technology in recent years have been concerned with the distribution of cement, a costly item in the delivery price. REDEC International, when carrying out large construction contracts in Saudi Arabia, developed floating silo terminals which could handle a throughput of up to 2 million tonnes a year of imported cement, all or part of the output of which could be bagged at the port. Over half of Saudi Arabia's imports were handled in this way. When production in Saudi Arabia increased and import demand began to fall in 1985, two of the largest floating silos were moved to Egypt.

(c) *UNIDO activities*

UNIDO technical co-operation with respect to the building materials industry, described in table 82, encompasses both large and small projects. UNIDO is

Table 82. Selected UNIDO technical co-operation projects related to the other non-metal mineral products industry

Region, country or area	*Source of funds*[a]	*Executing period*[b]	*Project title*[c]
Bangladesh	UNDP	1985-1986	Analysis of raw materials for non-metallic mineral-based industries
	UNDP*	1983—	Upgrading and development of indigenous building materials manufactures
Bhutan	UNDP*	1981—	Development of Bonsegeoma slate deposit
Botswana	UNDP	1984-1986	Assistance to the small-scale Portland Pozzolana Cement Plant
Burkina Faso	IDF*	1983—	Rehabilitation of the brickworks VOLBRICERAM
	RP	1986—	Tender specifications—clinker grinding plant for cement
Cameroon	UNDP	1980-1986	Consultation and formulation of a specific programme of assistance in the development of the local building industry and of energy sources in rural areas (in association with the United Nations Department of Technical Co-operation for Development)
Chad	IDF**	1983—	Assistance à la relance de la production des matériaux de construction
Chile	UNDP	1984—	Comportamiento de caminos en Chile—estudio de parámetros de diseño, construcción y mantención de pavimentos asfálticos
China	UNDP	1982-1986	Research and development centre for light building materials
	UNDP	1984-1986	Use of non-metallic minerals in agriculture and waste oil absorption
	UNDP*	1982—	Cement development centre
	UNDP*	1986—	Research and development for fly ash utilization
Democratic People's Republic of Korea	UNDP	1986—	Wet- and dry-process conversion of cement plants
Ecuador	UNDP	1986--	In-depth survey of the cement industry
Egypt	OTF*	1983-1986	Assistance to the Suez Cement Company
Ethiopia	IDF*	1981-1986	Assistance to the marble and stone industry
Gambia	IDF*	1982-1986	Establishment of a small-scale brick-making plant
	RP	1986—	Lime industry
Guinea-Bissau	IDF*	1985—	Etude pour l'établissement d'une cimenterie dans le Mayo-Kebbi
Haiti	UNDP*	1979—	Projet intégré de développement de la pierre
Hungary	UNDP	1980—	Energy conservation in the operation of buildings
Indonesia	UNDP**	1981—	Assistance in the development of building materials and supplies industry for low-cost housing

Table 82 (continued)

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Iraq	UNDP	1985-1986	Pollution control in the brick and tile industry
Libyan Arab Jamahiriya	OTF**	1985—	Assistance to the Zliten Cement Company
	OTF**	1986—	Fatayeh cement factory
	OTF**	1986—	Souk El Khamis Cement Factory
	UNDP	1986—	Assistance to the Secretariat of Heavy Industries in the co-ordination of technical assistance
	UNDP**	1986—	Assistance in strengthening the Libyan Cement Company
Madagascar	UNDP*	1982—	Promotion des matériaux locaux de construction
Malawi	RP	1986	Utilization of linthipe ceramic clays
Mexico	UNDP	1985—	Technical advice in aseismic construction strengthening and repair of buildings
	UNDP	1985—	Advisory mission on using rubber bases isolation techniques in aseismic construction
	UNDP	1986—	Advisory mission on protection and safety measures in buildings damaged by earthquake and other disasters
Mongolia	UNDP*	1982—	Establishment of a mineral pigments demonstration plant
Niger	UNDP	1981—	Renforcement des activités de la briqueterie SONICERAM
Republic of Korea	UNDP	1984—	Assistance to the Korea Institute of Construction Technology
Seychelles	UNDP*	1986—	Assistance in establishing a mineral resources development programme
Suriname	UNDP	1982-1986	Establishment of a ceramic tiles plant
Yemen	OTF*	1985—	Assistance to the Amran Cement Company
Yugoslavia	UNDP	1983—	Heat-insulation systems for external parts of buildings
Zimbabwe	IDF	1985-1986	Assistance in laboratory scale investigations on magnesite ore and magnesite bricks
	UNDP*	1983—	Strengthening government support services in the non-metallic mineral sector
Arab countries	COFN	1984—	Preparatory assistance—integrated utilization of bentonite in agriculture and industry in Algeria
Asia and the Pacific	UNDP	1983-1986	Regional network for the development of the small-scale cement industry
	UNDP	1982—	Low-cost building materials and construction systems
	IDF	1984—	Regional symposium on appropriate materials for low-cost housing in Asia, Bangkok, 20-26 January 1987
European countries	UNDP*	1979-1986	Building construction under seismic conditions in the Balkans region (associated agency: United Nations Centre for Human Settlements)
Interregional	IDF	1986—	In-Plant Group Training Programme in the field of cement industry, Ankara, 1987
	IDF	1983-1986	Joint programme for international co-operation in the field of ceramics, building materials and non-metallic mineral-based industries—joint programme of UNIDO and Czechoslovakia
	UNDP	1986—	Demonstration on base isolation for seismic construction

For footnotes see table 46.

helping to operate three large cement plants in the Libyan Arab Jamahiriya and a small-scale plant in Botswana. An in-depth survey of the cement industry was made for Ecuador in 1986. UNIDO has helped prepare tender specifications for a clinker grinding plant in Burkina Faso and advised on the conversion from wet-process to dry-process in cements in the Democratic People's Republic of Korea. Assistance to a cement enterprise in Yemen was started in 1986. Development of the lime industry is the goal of a project in Gambia.

Developing countries are being assisted in developing local raw materials and supplying building materials for low-cost housing projects. A brickworks is being rehabilitated in Burkina Faso and a slate deposit is to be developed in Bhutan. Gambia has a small-scale brick-making plant, and Haiti has been advised in the development of stone deposits. The UNIDO Investment Promotion Service promoted an investment of $8.1 million in a system for building low-cost houses in Colombia and an investment of $5.1 million in cement factories in China. The UNIDO Special Programmes and Activities Division has arranged assistance worth $5 million for upgrading operator skills at a large cement plant in Nigeria.

At the First Consultation on the Building Materials Industry, UNIDO was asked to provide information on the technological options for the production of building materials at different scales of operation. UNIDO collects and disseminates information on manufacturing processes that can be used on a small scale in rural areas. Examples of such processes are

provided by the mobile mechanized brick-making plant that has been introduced in the United Republic of Tanzania and demonstration projects that have been established for low-cost housing in Indonesia. Information will be exchanged through the regional network for low-cost building and construction systems that has been established for 12 countries in the Asia and Pacific region. UNIDO convened the First World Congress on Non-Metallic Minerals in 1985; a second is scheduled to be held in 1989.

*21. Iron and steel (ISIC 371)**

Steel billets, blooms, slabs or bars
Hot- and cold-rolled steel sheet
Castings, forgings and steel foundries
Steel tubes and pipes
Steel rails and rods

(a) *Present situation*

The iron and steel industry is a key sector contributing 5.3 per cent of industrial output in developing countries and 5 per cent in developed countries. Its contribution has declined in developed countries over the last 15 years. Between 1970 and 1985, steel output increased 0.3 per cent per annum in developed countries and 5.9 per cent per annum in developing countries. As a result, the developing countries' share of world output rose from 5.8 per cent in 1970 to 12.2 per cent in 1985 on the basis of a sample of 82 countries, or from 6.5 to 13.4 per cent on the basis of data from 165 countries. This was the sharpest increase in world production share achieved in any industry during this period (see figure XXXIX for regional trends).

Recent progress in raising the level of output in developing regions reveals strong contrasts. Between 1980 and 1985, value added in this industry was stagnant in Tropical Africa; it increased 8 per cent in Latin America, 25 per cent in North Africa, 24 per cent in Western Asia, 27 per cent in the Indian Subcontinent and 51 per cent in East and South-East Asia.

In 1986, output of crude steel in Latin America rose 5.3 per cent to 37.6 million tonnes and a further 6 per cent increase is expected in 1987. In Brazil, whose production is 57 per cent of the region's output, production rose 3.8 per cent in 1986. Argentina and Venezuela also increased their steel output in 1986, but in Mexico output declined.

In Asia (including Western Asia) output of crude steel rose 5.3 per cent to 38.1 million tonnes in 1986, and a further increase of 6 per cent is expected in 1987. Most of the increase was accounted for by the three largest steel-producing countries and areas in the region: the Republic of Korea, India and Taiwan Province, whose output increased by 7.2 per cent, 6.2 per cent and 3 per cent respectively. The Republic of Korea and Taiwan Province of China increased their steel exports and sold more steel to Japan. Indonesia has also entered export markets; in 1986 it exported 250,000 tonnes to the United States, Europe and Japan.

Output of crude steel in Africa increased 3.4 per cent to 2.9 million tonnes in 1986. Algeria, Egypt and Zimbabwe produce 83 per cent of the total output in the region. In 1986 Algeria increased output of crude steel by 26 per cent and Egypt increased output by 8 per cent, but in Zimbabwe output was 16 per cent less than the previous year.

In recent years demand for steel has been growing rapidly in Egypt whose consumption of finished steel products is expected to grow by 5.8 per cent per annum from 2.7 million tonnes in 1985 to 6.3 million tonnes in 2000. Egypt's largest steel plant is a flat products plant with design capacity of 1.2 million tonnes, and an expansion to 2.6 million tonnes capacity is being studied in co-operation with the USSR. When this and other planned projects are completed, Egypt's capacity will rise to 5 million tonnes.

The production of the largest producers of crude steel among developing countries in the period 1983-1986 is shown in table 83. Production has grown steadily in all the countries which implies that once capacity is established, there will be a growing demand for steel. This view is confirmed by estimates that production in developing countries was sufficient to supply only two thirds of demand in 1985.

Table 83. Production of crude steel in various developing countries and areas, 1983-1986

(Millions of tonnes)

Country or area	*1983*	*1984*	*1985*	*1986*
Brazil	14.7	18.4	20.5	21.2
Republic of Korea	11.9	13.0	13.5	14.6
India	10.2	10.5	11.5	11.9
Mexico	6.9	7.5	7.3	7.1
Turkey	3.8	4.3	5.0	6.0
Taiwan Province	5.0	5.0	5.1	5.2
Venezuela	2.3	2.8	3.1	3.5
Argentina	2.9	2.6	2.9	3.2

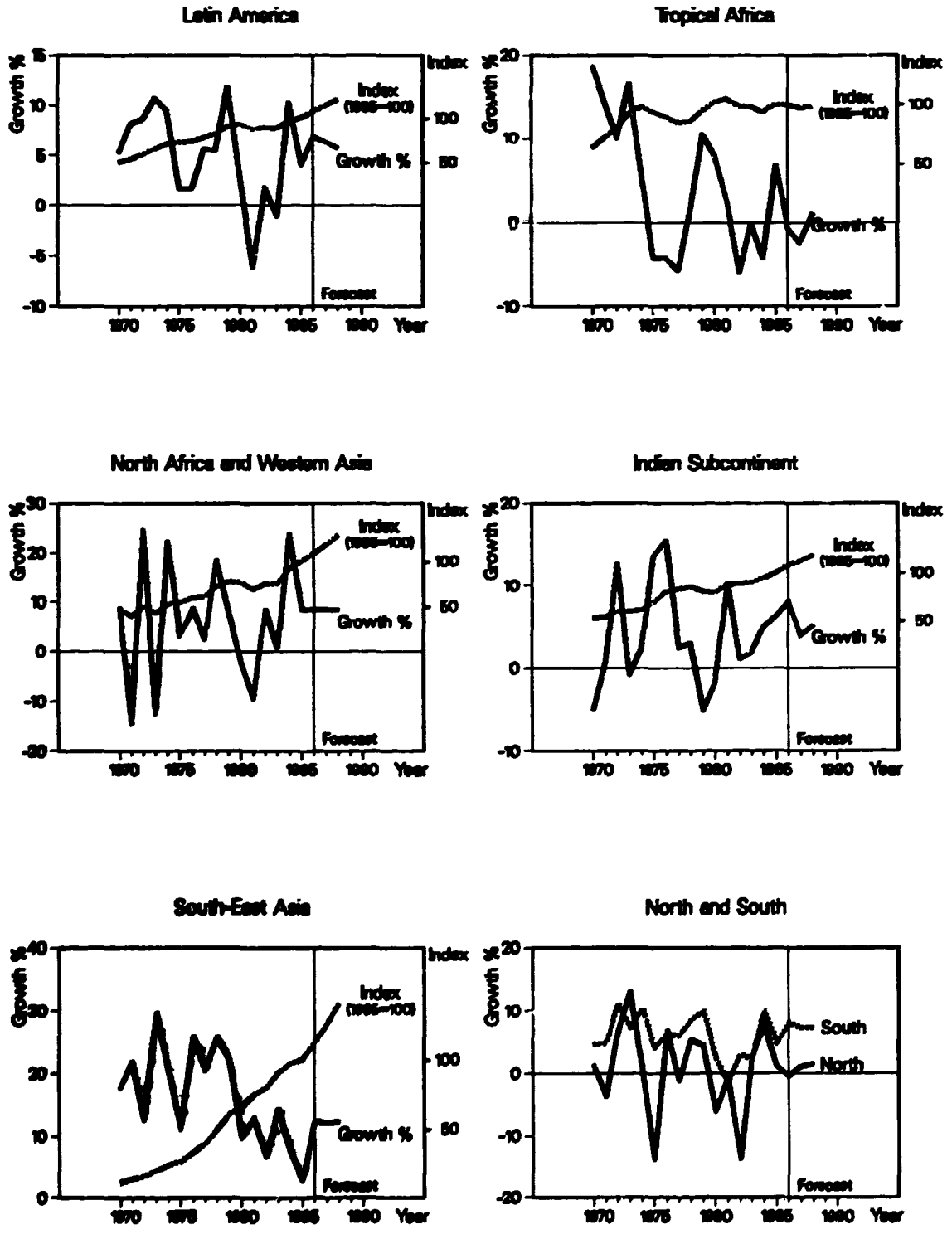
Source: International Iron and Steel Institute.

The year 1986 was another difficult one for the steel industry in developed countries. Output fell 6.7 per cent in Japan (by 7.0 million tonnes), 8 per cent in the United States (by 6.7 million tonnes) and 8.3 per cent in the Federal Republic of Germany (by 3.4 million tonnes). In these three countries the industry has been forced to reduce capacity and restructure over the last five years.

The most dramatic changes are taking place in Japan, where exports of 30.3 million tonnes of steel in 1986 were down 9 per cent; a further fall in 1987 is expected because of the realignment of the yen. At its peak in 1976, Japan had 72 blast furnaces, but now 54 remain, with 16 of them idle. The world's largest steel company, Nippon Steel Corporation, announced its rationalization plan in February 1987, under which 19,000 employees will be laid off and 5 of its 13 blast furnaces shut down. All other Japanese steel firms are also obliged to undertake rationalization programmes. It is reported that the five leading Japanese steel

*UNIDO acknowledges a contribution on this industry from Brian Cooper, Editor, *Steel Times International* (Surrey, England).

Figure XXXIX. Iron and steel (ISIC 371)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SIVELO.

firms will reduce their combined number of employees by 41,200, approximately a quarter of the present 172,000 employees.

(b) *Future prospects*

World steel production will continue to grow faster in developing countries because the output of the main steel-consuming industries (motor vehicles, shipbuilding, machine tools and other capital goods and domestic appliances) is still growing, while the quantity of steel used in developed countries may remain stagnant as a consequence of technological developments and greater use of substitutes for steel. Hence, the output of the iron and steel industry is expected to increase by 7.3 per cent in both 1987 and 1988 in developing countries, and by 1.4 per cent in 1987 and 1.8 per cent in 1988 in developed countries.

Output is expected to continue to grow faster in East and South-East Asia (12 per cent in 1987 and 12.3 per cent in 1988) and in Western Asia (8.9 per cent in 1987 and 8.8 per cent in 1988); slower growth is forecast for the Indian Subcontinent (3.9 per cent in 1987 and 5.2 per cent in 1988). Further recovery is expected in Latin America (output up 6.3 per cent in 1987 and 5.7 per cent in 1988) and in North Africa (output up 6.1 per cent in 1987 and 7.1 per cent in 1988). Tropical Africa could well do better than the stagnation of output that past trends predict.

These forecasts can be compared with those made by the International Iron and Steel Institute (IISI) shown in table 84. These show demand for steel (not production) growing between 1985 and 1995 at annual rates of 4.6 per cent in Latin America, 3.8 per cent in Asia, 1.8 per cent in Africa, and declining slightly in the Middle East. There appear to be two main reasons for the higher UNIDO forecasts. First, UNIDO forecasts production levels; these could increase faster than demand because developing countries still import one third of their total steel requirements. Second, UNIDO may well be basing its estimates on much faster rates of economic growth in developing countries than IISI assumed.

Between 1985 and 1995, world production of steel is expected to grow from 723 million tonnes to 760 million tonnes. Large increases in demand in developing countries will be offset by a decline in consumption from 543 million tonnes to 508 million tonnes in developed countries (see table 85).

Table 84. Estimates and forecasts of apparent steel consumption in developing regions, 1985-1995

(Millions of tonnes)

Region	Average consumption 1977-1983	Estimated consumption 1985	1986	1987	Forecast consumption 1990	1995
Asia	39	47	50	53	60	68
Latin America	31	28	28	29	35	44
Africa	10	10	10	10	11	12
Middle East	16	16	16	15	12	13
Total	96	101	104	107	118	137

Source: Annual Report of the Secretary-General of the International Iron and Steel Institute (Brussels, 1986).

A recent study [129] has taken an even longer-term view and predicted steel consumption in the year 2000. By 2000, China is forecast to be the world's largest producer (134 million tonnes), followed by the United States (84 million tonnes) and Japan (72 million tonnes). By that year, according to these forecasts, India (32 million tonnes), Brazil (29 million tonnes) and Republic of Korea (25 million tonnes) will have as large a demand for steel as the Federal Republic of Germany (31 million tonnes).

Steel manufacturing technology continues to improve and rely more extensively on automation. High-power electric furnaces currently account for 25 per cent of world steel production. Interest in the direct reduction process is reviving with lower energy costs. Mini-steelworks have proved successful in both developed and developing countries. The conversion of mills to continuous casting continues and downstream processes such as galvanizing have been automated.

Another trend in the 1980s has been the installation of computers to control the manufacturing process and to programme small batches of products tailored to customer demand. A number of developing countries are installing such computer systems. Modernization of the Republic of Korea's hot strip mill at Pohang includes installation of seven computers for automatic width control, automatic gauge control and roll eccentricity compensation systems. The mill will have better yields and improved strip thickness tolerances as a result. India is considering a large computerization programme drawn up by the Steel Authority of India. The plan would include microprocessors for improving productivity and quality in the steel industry.

(c) *UNIDO activities*

The largest number of UNIDO technical co-operation projects in 1986 were executed in the iron and steel industry (see table 86). They covered technology for processing iron ore, basic steel manufacture, manufacture of a range of steel products and special steels and foundry operations.

Table 85. Estimates of world steel consumption, 1985-1995

(Millions of tonnes)

Region, country or grouping	Average consumption 1977-1983	Estimated consumption 1985	1986	1987	Forecast consumption 1990	1995
North America	136	122	110	106	108	105
EEC	112	101	103	102	99	97
USSR and Eastern Europe	208	211	218	217	205	200
Japan	71	74	72	70	70	70
Other developed countries	34	35	36	37	35	36
Total	561	543	536	532	517	508
China	48	79	81	82	95	115
Other developing countries	96	101	104	107	118	137
World total	705	723	721	721	730	760

Source: International Iron and Steel Institute.

Table 86. Selected UNIDO technical co-operation projects related to the iron and steel industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Afghanistan	UNDP	1981-1986	Technical assistance for the rolling mill in Pul-i-Charkhi industrial areas
Algeria	UNDP	1986—	Evaluation des besoins de l'industrie sidérurgique
Angola	UNDP	1979—	Assistance in iron ore and scrap processing
	UNDP**	1981—	Foundry industry development
	UNDP*	1986—	Technical assistance in the reconstruction and expansion of Fabrica de Tubos de Angola
Argentina	UNDP**	1981—	Apoyo integral al desarrollo tecnológico de la siderurgia
	RP	1986—	Training in metallurgy
Benin	IDF	1985—	Etude de préfaisabilité pour l'installation d'une mini-aciérie
Bolivia	UNDP	1985-1986	Choice and formulation of technological process routes for iron and steel production based on domestic raw materials and natural resources
China	UNDP*	1980—	Assistance in hot processing technology
	UNDP	1985—	Resource recovery and utilization of wastes in metallurgical and other industries
	UNDP	1985—	Development of solders and materials for load frame used in electronic devices
Czechoslovakia	UNDP*	1982—	National Technical Consultancy and Training Centre
Democratic People's Republic of Korea	UNDP	1985-1986	Improvement of metallurgical products quality through surface finishing and treatment
	UNDP	1984—	Improvement of production of alloy steel in basic oxygen furnace
Democratic Yemen	IDF*	1978—	Modernization of the foundry and associated mechanical workshop at the Revolution Workshop Foundry
Egypt	UNDP*	1981—	Managed maintenance in metallurgical industries, Helwan iron and steel plant
	UNDP*	1985—	Energy conservation in metallurgical, glass and other industries
Ethiopia	UNDP	1984—	Technical assistance in electric arc-furnace steel-making
Guinea	UNDP**	1982—	Assistance au renforcement du Centre d'entretien et de réparation des équipements industriels
	UNDP	1985—	High-level advisory service for techno-economic re-evaluation and restarting of industrial utilization of the iron ore deposits
Hungary	UNDP*	1982—	Complex utilization of low grade and secondary raw materials for metallurgy and coal sorts of low calorific value
	UNDP*	1986—	Development of technologies for large-scale utilization of metallurgical and other industrial wastes as secondary raw materials
India	UNDP*	1981—	Design development for an experimental blast furnace
	UNDP**	1981—	Design development of a top- and bottom-blowing converter steelmaking operation
	UNDP*	1983—	Process and product development centre for small-scale casting and forging industries
	UNDP**	1985—	Introduction of computer system in SAIL plants
	UNDP**	1985—	Measures for energy saving and conservation in SAIL steel plants
	UNDP	1986—	Technical assistance in establishing a modern foundry plant for automobile industries
	UNDP	1986—	Advisory services to modernize and improve the operation of a Government-owned pressure dies casting unit
Iran (Islamic Republic of)	UNDP	1985-1986	Diversification of the production of malleable casting
	UNDP	1986—	Improvement of metallurgical technologies applied by Iranian Development and Renovation Organization industries
Jamaica	UNDPTF	1980-1986	Upgrading the scientific and technological capabilities of the Jamaica Bauxite Institute
Lesotho	UNDP	1986—	Mini-foundry casting facility
Libyan Arab Jamahiriya	OTF*	1984—	Assistance to the General Pipe Company
Mexico	IDF	1983-1986	Technical assistance to the Mexican Iron and Steel Research Institute
	UNDP	1985-1986	Advisory mission on establishment of computerized maintenance system in the iron and steel industry
Mongolia	IDF	1983-1986	Detailed project report including comprehensive techno-economic evaluation for the establishment of a mini steel plant
Morocco	UNDP*	1982—	Assistance to the foundry sector
Mozambique	UNDP	1981-1986	Supporting technical missions for the iron and steel group

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
	UNDP*	1981-1986	Technical assistance to Companhia Industrial de Fundicao e Laminagem in metallurgical technologies
	UNDP*	1981—	Strengthening national capabilities in steel industry development
	OTF*	1982—	Report on the establishment of a technological semi-industrial metallurgical and non-metallic testing and development laboratory
	IDF	1984—	Preparation of a detailed project design and execution programme for the establishment of a network of metal production and processing units
	UNDP*	1985—	Technical assistance to the existing industries under UNIDADE de Direcçao de Metalurgia
Nepal	UNDP**	1979—	Establishment of a pilot and demonstration foundry
Nicaragua	UNDP	1982—	Upgrading of existing foundry capacities
	RP	1986—	Continuation to fellowship training: steel foundry, moulding and design, moulds and dies
Niger	UNDP*	1981—	Création d'une installation de fonderie et de forge pour la production et la démonstration
	UNDP	1985—	Technical investigations of the production of sponge iron for steel-making utilizing indigenous iron ores and coals
	UNDP	1985—	Central metallurgical research and development institute
Nigeria	OTF**	1980-1986	Central metallurgical research and development institute
	UNDP*	1986—	National metallurgical research and development centre
Pakistan	UNDP*	1975—	State Heavy Engineering Corporation
	UNDP*	1982—	Assistance in production of quality and special steels using existing industrial facilities
	UNDP*	1983—	Assistance to Pakistan Engineering Company
	UNDP*	1984—	Short-term consultancies to State Engineering Corporation
	UNDP*	1984—	Assistance for the establishment of a multi-purpose ore beneficiation pilot plant
Paraguay	UNDP*	1982—	Technological strengthening of the metallurgical industry
Peru	UNDP*	1981—	Centro de tecnologia metalúrgica industrial
Romania	UNDP	1985—	Assistance to the Research and Design Centre for tubular and drawn products in rehabilitation and commissioning of materials testing system equipment
Sierra Leone	UNDPTF*	1983—	Technical assistance to the National Workshop
Somalia	IDF	1985-1986	Technical assistance in upgrading of production efficiency and local skill of the foundry mechanical workshop
	RP	1984—	Rehabilitation of equipment and upgrading of the efficiency of the foundry mechanical workshop
	UNDP*	1984—	Assistance to the foundry mechanical workshop
Sri Lanka	UNDP	1984-1986	Improvement of pipe production of Ceylon Steel Corporation
Sudan	UNDP	1986—	Assistance to the Sudan Mint Foundry in improving the operation of induction melting furnaces
Turkey	UNDP	1986—	High-level advisory assistance for PARSAN in forging, dies and heat-treatment technology
Uganda	UNDP*	1984—	Assistance to the Ministry of Industry/Iron and Steel Industry
United Republic of Tanzania	UNDP*	1980—	Establishment of a Small Industries Development Organization foundry with integrated mechanical workshops
	UNDP	1985—	Foundry performance improvement programme
Viet Nam	UNDP	1984-1986	Laboratory bench-scale investigations on the production of sponge iron for steel-making based on iron ores and coals
	UNDP	1984-1986	Quality improvement of cast spare parts supplied for textile plants by foundry industries
	UNDP*	1980—	Manufacture of magnetic materials and components for use in electronic engineering
	UNDP	1986—	Assistance to textile industries in manufacturing cast spare parts for improved equipment maintenance
	UNDP	1986—	Assistance in preparation of pilot and industrial scale production of sponge iron
Zimbabwe	UNDP	1984-1986	Assistance to ZISCOSTEEL in electrical maintenance of iron-making, steel-making and rolling-mill equipment
	UNDP*	1985—	Bar rod rolling mill at ZISCOSTEEL
	UNDP*	1986—	Assistance to ZISCOSTEEL in improvement of metallurgical quality control
Africa	IDF	1985-1986	Joint UNIDO/ARCEDEM workshop on core metallurgical industries for African developing countries, Hungary, 30 September-12 October 1985
	UNDP*	1979—	Preliminary study of the iron ore deposits (assistance to the Niger-Nigeria Economic Commission)

Table 86 (continued)

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Africa (continued)	IDF	1982—	Inter-country project for managed maintenance in metallurgy/foundry industries
	UNDP	1984—	Assistance from ZISCOSTEEL to steel industries in Ethiopia, Mozambique and Uganda
	IDF	1985—	Preparation of detailed designs for the establishment of a demonstration investment foundry with auxiliary demonstration plant for manufacture of wax replica injection dies
	IDF*	1985—	Inter-country programme for managed maintenance systems in metallurgical and other industries in Africa
Arab countries	UNDP*	1981—	Regional programme for upgrading of technical skills of manpower of the Arab iron and steel industry
Asia and the Pacific	IDF*	1977—	ASEAN advisory services for regional steel standardization
	UNDP*	1981—	Regional development of sponge iron industry
Interregional	IDF	1986—	In-Plant Group Training Programme in the field of small-scale foundry operations for least developed countries, land-locked and selected island developing countries, Ankara, 22 September-7 November 1986

For footnotes see table 46.

Many small countries operate a foundry and UNIDO has provided assistance in establishing or operating foundries in Angola, Democratic Yemen, India (specifically for automobile parts), Lesotho, Morocco, Nepal, Nicaragua, Niger, Somalia and United Republic of Tanzania.

Another focus has been the rehabilitation and modernization of existing plants, for example in Afghanistan (steel rolling mill), Angola (steel tubes), Ethiopia (electric-arc-furnace steel-making), India (pressure die castings and small-scale casting and forging), Islamic Republic of Iran (improvement in metallurgical technologies), Libyan Arab Jamahiriya (steel pipes), Mozambique (metallurgical technology), Romania (research and design of tubular and draw steel products) Sri Lanka (steel pipe production) and Zimbabwe (quality control steel rods).

The existing steel industry has been assisted in different ways in other countries. Some of the various types of assistance, or the institutions or plants involved, are as follows: Algeria and Argentina (diagnostic studies); Czechoslovakia (national consultancy and training centre); Egypt (managed maintenance and energy conservation); Hungary (use of metallurgical wastes); India (introduction of computer systems and energy saving); Mexico (Iron and Steel Research Institute and computerized maintenance system); Mozambique (technical advisory mission); Nigeria (metallurgical research and development centre); Paraguay (technology); Peru (centre for industrial metallurgical technology); Sierra Leone (workshop); Uganda (diagnosis); and Zimbabwe (steel-rod rolling mill).

UNIDO has also assisted in evaluating raw materials for, or their applications in, the iron and steel industry in Angola (iron ore and scrap), Guinea (iron ore), Hungary (use of low-grade materials), Niger (sponge iron from local iron and coal), Pakistan (ore beneficiation) and Viet Nam (sponge iron).

The establishment of new steel-producing facilities have been examined in Benin (pre-feasibility study for mini-steel-plant), Bolivia (choice of process routes) and Mongolia (evaluation of mini-steel project).

Assistance in specialized technology (not including processing of technology) has been extended to China. Other countries receiving such assistance, and the types of technology involved, include the following: Democratic People's Republic of Korea (surface finishing and alloy steels), India (blast furnace design and converter design), Islamic Republic of Iran (malleable casting), Pakistan (special steels) and Republic of Korea (surface treatment).

UNIDO has convened four Consultations on the iron and steel industry, the last in June 1986. They considered the obstacles developing countries face in establishing an iron and steel industry, technology trends, mini-steel-plants and the current situation in the industry. This forum has promoted an exchange of views and the discussion of specific opportunities for bilateral co-operation.

Five Japanese firms participated in a programme organized by the UNIDO Investment Promotion Service office in Tokyo in 1986. Representatives from the industry in China, Egypt, Indonesia and Thailand participated in the programme and 17 investment projects were identified for promotion by UNIDO.

22. *Non-ferrous metals (ISIC 372)*

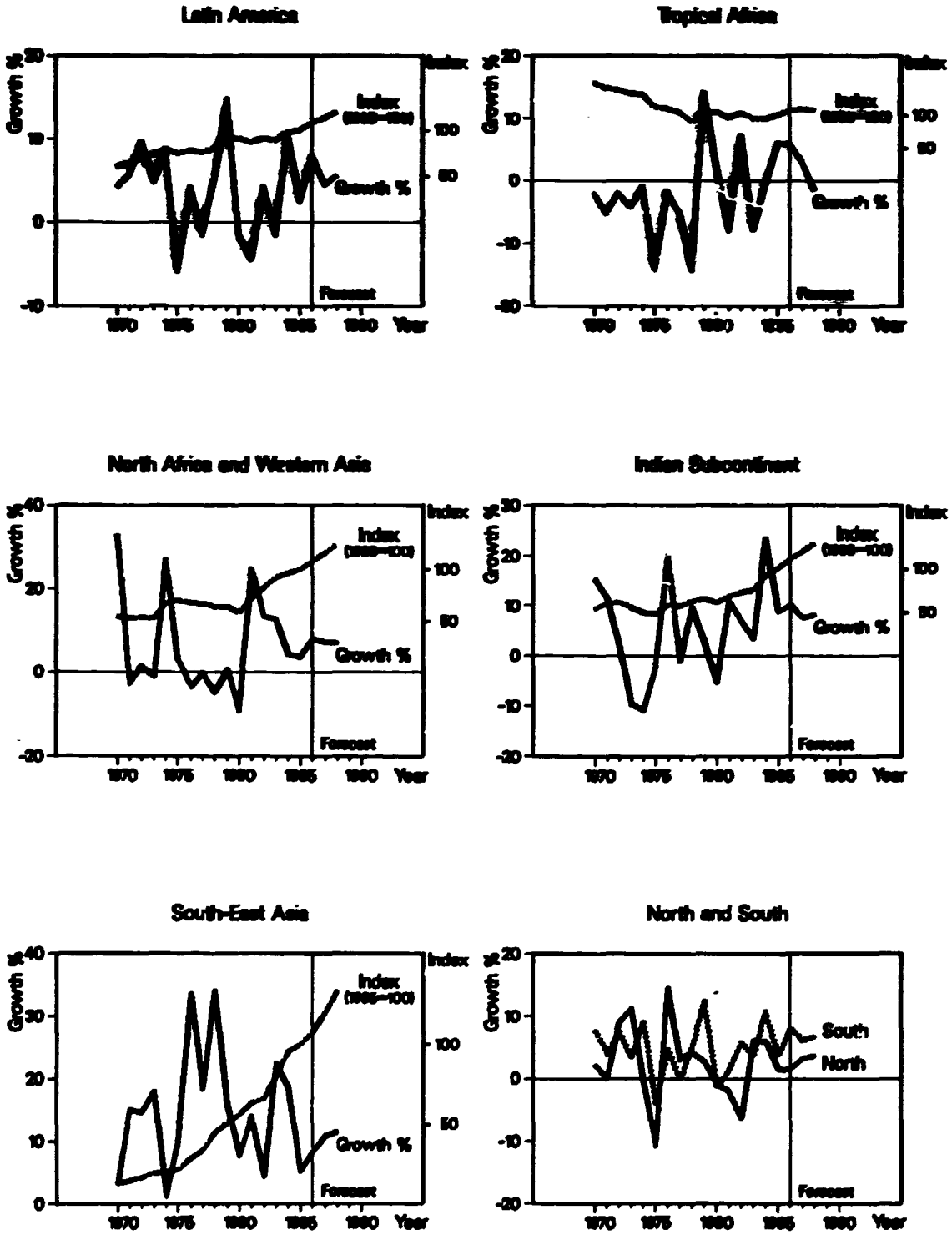
Smelting and refining non-ferrous metals including production of alumina from bauxite

Production of ingots, bars, rods, tubes, pipes, wires, castings and extrusions

(a) *Present situation*

The non-ferrous metal industry is an important export industry for developing countries, contributing 1.75 per cent of total manufacturing output in 1985. In developed countries its contribution was 1.9 per cent in 1985, that is, about one third that of the iron and steel industry.

Figure XL. Non-ferrous metals (ISIC 372)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SPR/GLO.

In 1985, it contributed 1.5 per cent of total manufacturing output in Western Europe, 1.9 per cent in North America and 2.5 per cent in Japan. In developing regions its contribution in 1985 varied from over 2 per cent in Latin America and North Africa and Western Asia to 1.5 per cent in Tropical Africa and 0.7 per cent in the Indian Subcontinent.

Between 1970 and 1985, output of non-ferrous metals grew almost twice as fast in developing as in developed countries (4.3 versus 2.3 per cent). As a result, the developing countries' share of world output increased from 8.3 to 10.7 per cent on the basis of a sample of 82 countries, or from 9.4 to 11.8 per cent on the basis of data from 165 countries (see figure XL for regional trends).

The main part of the output of the non-ferrous metals industry is aluminium, copper, lead, zinc and tin. The refining of non-ferrous metals is concentrated in a few developing economies. Chile is the largest producer of refined copper, followed by Zambia, Peru and Zaire. Brazil is the largest producer of aluminium, followed by Venezuela, India, Argentina, Ghana and Egypt. Mexico is the largest producer of refined lead and zinc, followed by Brazil and Peru, while the largest producers of tin are Malaysia, Indonesia, Bolivia, Brazil and Nigeria.

Aluminium

World output of aluminium reached a peak level in 1980 and has yet to regain that level. Between 1980 and 1985 demand fell by 4 per cent and the capacity of the world aluminium industry was reduced, in particular in the two largest aluminium consuming countries, the United States and Japan. In the former country, 20 per cent of the consumption of 4.4 million tonnes was supplied by imports in 1985. Approximately 1.2 million tonnes of capacity was shut down between 1982 and 1985 to bring supply into a better balance with demand. In Japan, the adjustment has been more dramatic. In 1977, that country produced 1.2 million tonnes of primary aluminium, the world's third highest production level after the United States and the USSR; the industry supplied 84 per cent of its domestic consumption by 1985. However, as the rise of electricity costs made the Japanese primary aluminium industry uncompetitive, domestic production declined to 0.23 million tonnes, a mere 13 per cent of domestic consumption. After the recent sharp rise in the external value of the yen, two of the remaining three operating smelters may be shut down in 1987. This would leave one smelter currently producing 35,000 tonnes per annum as the sole survivor of the industry [130].

While the industry has contracted in developed countries, developing countries have undertaken a number of expansion plans and new projects to build aluminium smelters. The new projects take advantage of low electricity costs to produce primary aluminium. Brazil and Venezuela in Latin America and India and Indonesia in Asia have expanded their primary aluminium output in recent years (see table 87).

The decline in aluminium production in Japan has been matched by new production in Indonesia. An investment of 411 billion yen, Japan's largest single venture in Asia, was made in a project consisting of the hydro-electric power station (500 megawatts) and an aluminium smelter (capacity of 225,000 tonnes per year) on the Asahan river. Aluminium production began in 1982. Only some 30,000 tonnes are consumed domestically; most of the remaining output is exported to Japan. The recent sharp appreciation of the yen has raised the Indonesian currency cost of interest payments to an unforeseen high level, but the Government of Japan, together with the related private firms, will make an additional loan of 24 billion yen in 1987.

Venezuela, the third largest primary producing country after Brazil and China, has a large-scale State-owned aluminium sector, two aluminium smelters, Venalum and Alcasa, and an aluminium refinery, Interalumina. Helped by the depreciation of the Venezuelan bolivar, Venalum's output of primary aluminium rose to 295,000 tonnnes in 1986 and Alcasa produced output of 125,000 tonnes at full capacity. Their increased sales and profits will enable them to invest in a further expansion of production capacity.

The primary aluminium industry is growing fastest in China. That country has planned the construction of six aluminium smelters and expansions at five existing alumina and aluminium units in order to catch up with the rapidly growing domestic demand for aluminium. By the end of the 1980s, China is expected to double its output from the current annual production of around 400,000 tonnes, and by the early 1990s the total smelting capacity is expected to reach 1.2 million tonnes.

Joint ventures have become a prominent feature of the world aluminium industry. By the mid-1980s, about 65 per cent of world bauxite capacity, about 50 per cent of alumina and about 35 per cent of primary aluminium capacity was owned by joint-venture organizations. A total of 55 smelters are, or will be, joint ventures. They are located in Latin America (17), Oceania (10), Africa (9), North Africa and Western Asia (3), Western Europe (9) and North America (7) [131].

Lead

World output of lead increased only 3 per cent between 1980 and 1985, and the outlook is for continued slow growth. Lead is consumed mainly in the production of storage batteries and gasoline antiknock additives (tetraethyllead). There is little change in prospect for the use of lead in storage batteries in the future, but by the early 1990s most developed countries propose to have all new motor vehicles using unleaded fuel for environmental reasons.

As table 87 shows, there has been little significant change in the pattern of world output of refined lead since 1980 except in Asia, where production rose 75 per cent between 1980 and 1985. Indonesia, Malaysia, Republic of Korea and Taiwan Province increased consumption and output. As motor vehicle ownership expands, the demand for lead will continue to grow in developing countries.

Zinc

Zinc is consumed for steel galvanizing, die-castings, brass, rolled zinc and slab zinc. These metals have a variety of end-uses, as in automobile parts, electrical parts, housings, bridges, road signs, durable goods, minting etc. World-wide excess production of zinc has led to a fall in prices. The average price of zinc on the

London Metal Exchange in 1986 was 34 cents per pound (454 grams), over 20 per cent lower than the average price in 1984. Zinc output has been increased substantially to meet rising demand in Brazil, India, Mexico and Republic of Korea. In China, where domestic demand has been expanding rapidly, output has also increased.

Copper

The output of refined copper in the developed market economies declined 4 per cent from 5 million to 4.8 million tonnes in the period 1980-1985. There is little scope for consumption to rise in the future because more plastics are being used as a substitute for copper in some motor vehicle parts and cable manufacturers are beginning to use more glass fibres instead of copper.

Many developing countries import copper from abroad to satisfy domestic demand. Brazil has been rapidly expanding copper output and smelting capacity, but when demand increased sharply in 1986, imports of copper (90,000 tonnes) went up to three times the 1985 level [132].

In Tropical Africa, Zaire expanded output between 1980 and 1985 but Zambia's output declined. The lower price of copper has adversely affected both economies.

Chile, with its rich copper mines, has been the world's leading copper producer. Copper exports account for 50 per cent of total foreign exchange earnings and 10 per cent of GDP. The Chilean State mining company, CODELCO, plans to invest over $1,500 million in the period 1986-1990 to boost production and technical efficiency. As a result, Chilean copper output is expected to rise from 0.88 million tonnes in 1985 to 1.7 million tonnes by 1990 [133].

Over the last 20 years, most of the less efficient zinc smelters have closed. Those remaining have been upgraded and use relatively modern technology. There has been increased government participation in ailing smelters in Europe and in mines and smelters in Canada. The involvement is still less than in the copper smelting industry, but it makes it more difficult for the industry to adjust to changing market conditions and world patterns of production.

Tin

At its peak in 1979, world tin production was 247,000 tonnes; since then it has fallen, to 240,000 tonnes in 1980 and 206,000 tonnes in 1985. Tin output has been falling because of increased use of aluminium and plastic con-

Table 87. World production of non-ferrous metals, 1980 and 1985

(Thousands of tonnes)

Region, country or area	Primary aluminium		Refined lead		Smelter zinc		Refined copper		Smelter tin	
	1980	1985	1980	1985	1980	1985	1980	1985	1980	1985
North America	5 722	4 782	1 386	1 265	962	1 004	2 191	1 936	5	4
United States	4 654	3 500	1 151	1 025	370	312	1 686	1 436	5	4
Canada	1 068	1 282	235	240	592	692	505	500	—	—
Western Europe	3 793	3 652	1 556	1 630	1 828	1 976	1 492	1 625	23	26
EEC	2 066	1 905	1 197	1 209	1 329	1 373	1 018	1 060	18	22
Japan	1 092	227	305	367	735	740	1 014	936	1	1
Other developed countries	546	1 260	276	252	382	382	330	339	7	6
Australia	304	852	234	212	301	288	182	193	5	5
South Africa	87	165	35	34	81	94	148	146	2	3
Caribbean and Latin America	819	1 163	411	419	326	494	1 176	1 347	26	35
Argentina	133	140	42	35	39	30	—	—	—	—
Brazil	261	549	82	73	79	116	39	121	10	25
Chile	—	—	—	—	—	—	811	884	—	—
Mexico	43	43	185	202	145	184	103	116	1	—
Venezuela	328	403	10	20	—	—	—	—	—	—
North Africa and Tropical Africa	351	307	121	121	102	125	760	762	4	3
Egypt	120	179	—	—	—	—	2	2	—	—
Morocco	—	—	42	64	—	—	—	—	—	—
Zaire	—	—	—	—	44	66	144	227	—	—
Zambia	—	—	10	10	33	23	607	510	—	—
Asia	443	872	80	144	119	243	117	383	141	90
India	185	267	26	24	44	71	23	28	—	—
Indonesia	—	217	2	7	—	—	—	—	31	20
Malaysia	—	—	3	10	—	—	—	—	71	46
Philippines	—	—	5	7	—	—	—	130	—	—
Republic of Korea	18	18	15	20	76	112	73	152	—	2
Taiwan Province	64	—	17	49	—	—	20	47	—	—
Centrally Planned Europe	3 286	3 168	1 322	1 417	1 700	1 787	2 217	2 387	34	41
USSR	2 420	2 300	780	810	1 060	1 050	1 300	1 400	17	18
China	350	425	175	215	155	215	295	320	15	19
World total	16 051	15 430	5 458	5 616	6 155	6 750	9 297	9 714	240	206

Source: Metallgesellschaft Aktiengesellschaft, *Metallstatistik 1975-1985* (Frankfurt am Main, 1986).

Table 88. Selected UNIDO technical co-operation projects related to the non-ferrous metals industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Angola	RP	1985-1986	Establishment of a mobile electro-mechanical repair and maintenance workshop at the National Metal Scrap Enterprise
Brazil	UNDP	1986—	Assistance for activating the production of gold
Chile	UNDP**	1984—	Bacterial leaching of copper from Chilean ores
China	UNDP*	1980-1986	Chemical reaction engineering laboratory for extractive metallurgy
	UNDP	1984-1986	Pilot demonstration testing for utilization of bauxite residues of the Shangdon Alumina Plant
	UNDP*	1980—	Assistance to the establishment of a pilot plant for the manufacturing of aluminium alloy door and window frames
	UNDP*	1981—	Energy conservation in the aluminium industry
	UNDP*	1985—	Experimental tube digestion of bauxite
Cuba	OTF	1982-1986	Development of mineral processing technologies
	UNDP**	1981—	Mineral beneficiation pilot plant
	UNDP**	1986—	Pilot plant for the exploitation of metallic and non-metallic minerals
Democratic Yemen	UNDP	1985—	Assistance to REVOMETAL
Greece	UNDP	1983—	Techno-economic investigation of production of de-ironed refractory bauxite
Hong Kong	UNDP	1984—	Development of hard chromium plating for wear resistant application in manufacturing industries
India	UNDP*	1981—	Electro-metallurgical production of aluminium silicon alloys from sillimanite concentrate
	UNDP*	1984—	Demonstration unit of alumina calciner for energy conservation
	UNDP*	1984—	Assistance for production of super-purity aluminium
	UNDP	1984—	Techno-economic study for industrial utilization of red mud waste from bauxite processing
Indonesia	UNDP*	1981—	Master plan for the development of an aluminium downstream industry
Iran (Islamic Republic of)	UNDP*	1985—	Development of alumina industry
	RP	1986—	Pilot investigations of alunites
Jamaica	UNDPTF**	1980-1986	Upgrading the scientific and technological capabilities of the Jamaica Bauxite Institute
Mauritania	UNDP*	1980-1986	Etude de faisabilité sur l'extraction de l'or et de l'argent contenus dans les résidus miniers d'Akjoujt
Mozambique	UNDP*	1982—	Assistance to the establishment of an aluminium industry
Nicaragua	UNDP	1986—	Technical assistance in the operation of the aluminium extrusion plant
Pakistan	OTF**	1980—	Development centre for silicon technology (in association with the United Nations Department of Technical Co-operation for Development)
Paraguay	UNDP	1985—	Establecimiento de un centro para la formación de personal para la producción de carbón vegetal siderúrgico
Peru	UNDP	1985—	Study of supply alternatives for the copper hydro-metallurgical plant
Sri Lanka	UNDP	1983-1986	Assistance to Ceylon Mineral Sands Corporation
Viet Nam	UNDP**	1985—	Technical assistance for the establishment and operation of a laboratory for bauxite processing technology
Yugoslavia	UNDP*	1975—	Establishment of the aluminium institute for research and development
Zimbabwe	UNDP	1982-1986	Assistance in the processing of ores of light non-ferrous metals
Africa	IDF	1985-1986	Workshop and demonstration of appropriate technologies and equipment for the metallurgical and metal processing industries, Katowice, Poland, 25-29 August 1985
Latin America	IDF	1984—	Demonstration workshop on laboratory and pilot-scale bauxite processing for the Caribbean region, Kingston, Jamaica, 28 June-8 July 1985
Interregional	IDF	1983-1986	Programme for development of the bauxite/aluminia/aluminium industry in developing countries, Budapest, 24 October-26 November 1983

For footnotes see table 46.

tainers. The amount of tin consumed to manufacture tinplate, its major end-use, has fallen by a quarter in the last five years [134].

In recent years two large tin-producing countries, Brazil and China, have expanded their production and exports. Brazil's exports increased four times between 1981 and 1985 to 20,000 tonnes [135]. As falling demand was not matched by a reduction in world supply, tin prices collapsed in October 1985 when the International Tin Council exhausted the funds available to stockpile tin and hence prop up the tin price. After several months of suspension, tin trading resumed operation in February 1986 in Kuala Lumpur with the prices down from $5.20 to $2.80 per pound (454 grams). At this price level, tin is more competitive and it may be able to regain some of the ground lost to other materials. Efforts to promote tin consumption are directed towards new markets in China and certain other developing countries of Asia where tin substitutes are at an early stage of development ([136], p. 24). In January 1987, the world's leading tin-producing countries agreed to quotas on exports to restrict their output and reduce stocks overhanging the market. Hence the prospect is for a better balance of supply and demand and higher prices by 1990 [137].

(b) *Future prospects*

The output of the industry processing non-ferrous metals is expected to increase by 6 per cent in 1987 and 6.7 per cent in 1988 in developing countries, and by 3.3 per cent in 1987 and 3.9 per cent in 1988 in developed countries.

In this industry, the output of Latin America, which accounts for 70 per cent of the output of the South, is expected to increase by 4.5 per cent in 1987 and 5.6 per cent in 1988. Very rapid output growth is forecast for South-East Asia (10.9 per cent in 1987 and 11.3 per cent in 1988) and for Western Asia (7.9 per cent in 1987 and 7.4 per cent in 1988). Tropical Africa experienced a long decline in the output of this industry up to 1984, but output is expected to increase by 3 per cent in 1987 before declining 1.5 per cent in 1988. In North Africa, output growth of 1.8 per cent in 1987 and 3.8 per cent in 1988 is forecast.

High technology has enabled the development of a number of replacements for non-ferrous metals such as plastics, ceramics and glass fibres, which have taken over a share of the traditional markets of non-ferrous metals. Research to develop substitutes and apply them to end-use products is continuing in various industries. As a result, demand for non-ferrous metals has virtually stopped growing, except in developing countries that do not yet use the advanced technologies to the same extent.

Slow market growth and the advent of high energy costs in the 1970s forced the non-ferrous metals industry in developed countries to adapt and restructure. Despite declining demand, a solid market for non-ferrous metals still exists in the North. The major factors leading to a reduction in the number of operating mines and smelters in the North is the exhaustion of high-grade ore bodies, the high costs to produce metals that result, high labour costs and high energy costs. Consequently, some firms in the non-ferrous metals industry have transferred part of their production to developing countries to reduce costs. While employment contraction is a concern in the North, the host developing countries are receiving benefits from the new division of labour.

In the long term, it is envisaged that there will be some further transfer of production capacity from the North to the South. For developing countries, therefore, the non-ferrous metals industry will continue to be a faster-growing industry than in the North and an important foreign exchange earner, as well as a vital supplier to the domestic capital goods and other industries.

(c) *UNIDO activities*

In 1986, UNIDO technical co-operation covered the production of alumina, aluminium and aluminium products as well as the production of copper and gold (see table 88). The Organization assisted in the beneficiation of minerals in Cuba, in the treatment of bauxite in China, in strengthening the technological capabilities of the Jamaica Bauxite Institute and in establishing an aluminium institute in Yugoslavia. A laboratory for extractive metallurgy was assisted in China, and Chile was helped to introduce the bacterial leaching of copper from local ore bodies. Brazil was given assistance in activating the production of gold.

Technical assistance in the field of alumina production was extended to China (utilization of bauxite residues), to India (alumina calciner for energy production and utilization of waste from bauxite processing) and the Islamic Republic of Iran (development services). At the stage of producing aluminium, China sought UNIDO advice on energy conservation, India on the production of super-purity aluminium.

UNIDO will convene the First Consultation on the Non-Ferrous Metals Industries in December 1987. A study on the development and restructuring of the non-ferrous metal industries was prepared and discussed at a Latin American regional meeting held at Caracas in February 1987.

23. *Metal products (ISIC 381)*

Cutlery, hand tools, general hardware

Furniture, fixtures primarily of metal

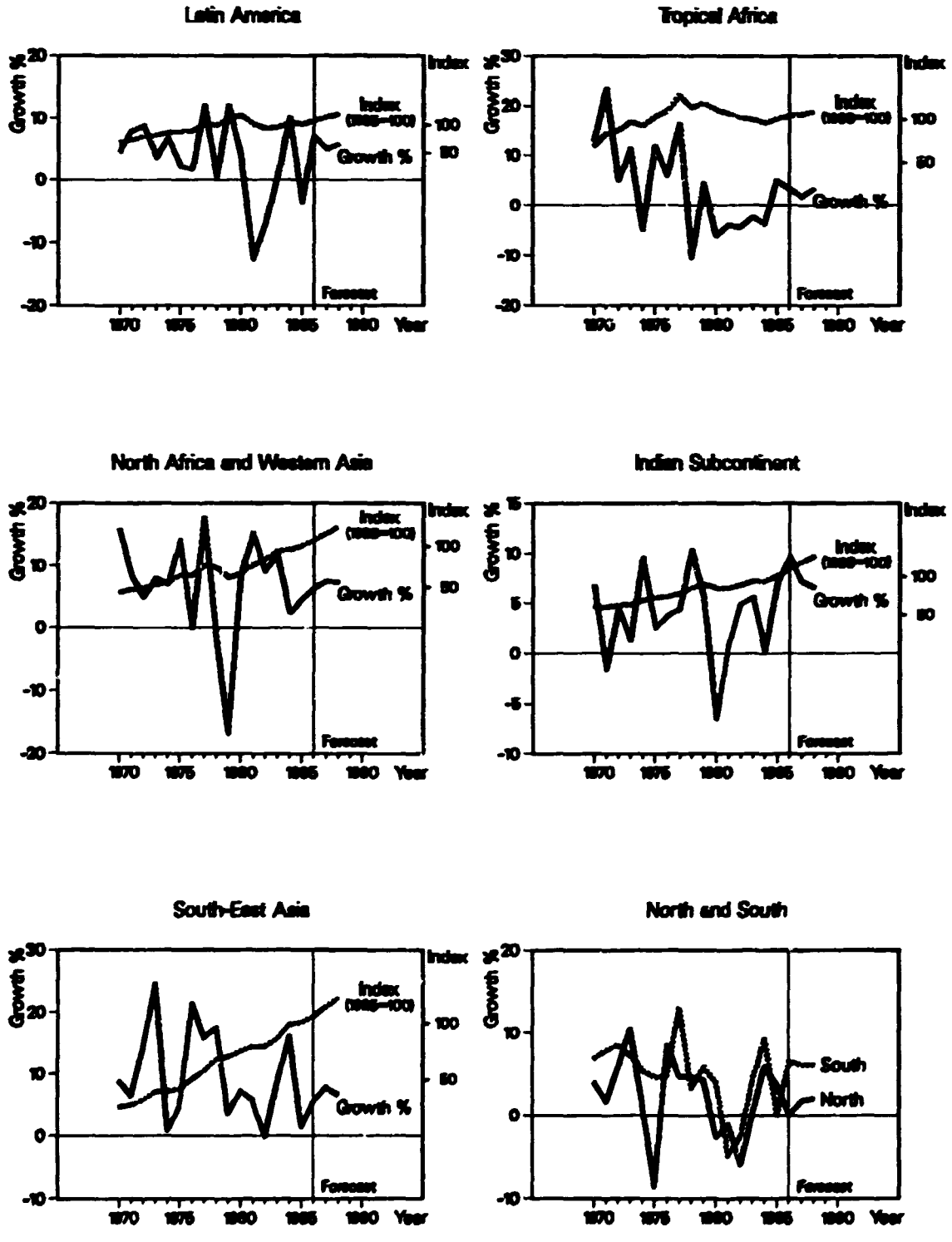
Structural metal products such as metal doors and windows, metal sections in ships, prefabricated components for bridges and boilers etc.

Other fabricated metal products such as metal cans, drums, wire and cable, rods, valves and pipe fittings

(a) *Present situation*

The historical trend is for the contribution of the metal products industry to total manufacturing output to decline gradually as the output of other branches of the engineering industry grow in importance. In Japan it fell from 6.9 per cent in 1975 to 5.9 per cent in 1985, and in the United States in the same period from 7.6 per cent to 6.8 per cent. In Eastern Europe and the

Figure XLI. Metal products (ISIC 381)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SPAD.

USSR, however, it increased from 2.7 per cent in 1975 to 2.9 per cent in 1985.

This gradual decline is not found in developing countries, where the engineering industry is growing in importance. In Latin America, the industry's contribution did fall, however, from 5.0 per cent in 1975 to 4.5 per cent in 1985 as the output of capital goods declined between 1982 and 1985; in South-East Asia it was constant at 4.2 per cent during this period; and in the Indian Subcontinent the industry's contribution rose from 2.2 per cent in 1975 to 2.4 per cent in 1985.

Between 1970 and 1985, the output of this industry grew much faster in developing countries than in developed countries (on average, 4.6 versus 2.0 per cent per annum). As a result, the share of developing countries in world industrial output increased from 6.4 per cent in 1970 to 9.1 per cent in 1985 on the basis of a sample of 82 countries, or from 7.3 to 10 per cent on the basis of data from 165 countries (see figure XLI for regional trends).

The output of the metal products industry in developed countries increased very little in 1986. After a strong recovery in the United States in 1985, output fell in 1986. Output in the EEC countries increased about 1 per cent in 1986. In Japan, there was no output growth in 1985 and 1986. This reflects the weak stimulus of investment spending in the fourth year of the economic upswing in those developed countries.

The performance of the industry in developing countries during the period 1980-1985 was varied. In Latin America, output fell by 7.5 per cent, less than in other branches of the capital goods industry. In Tropical Africa, output fell by 8 per cent, but in all other regions output expanded: by an estimated 38 per cent in North Africa, by 30 per cent in the Indian Subcontinent, by 35 per cent in East and South-East Asia and 57 per cent in Western Asia.

Development of the metal products industry comes at the first stage of developing a capital goods industry and usually accelerates when a broad range of steel products is manufactured. It is essential for the construction of building and civil works and for the maintenance and repair of machinery and equipment. The metal products industry requires steel angles, sections and sheet, galvanized steel sheet and special steels. The 1980-1983 world recession and subsequent international debt crisis left many countries short of foreign exchange. In many developing countries, especially in Africa, this has limited the supplies of imported steel that the metal products industry requires, and discouraged enterprises manufacturing metal products from expanding their production.

Many developing countries import a major part of their requirements of metal products. In total, the South's imports were $13.6 billion in 1983, accounting for about one third of the South's total requirements. Latin America and many of the countries in South-East Asia are almost self-sufficient, but imports were important for the North Africa and Western Asia region ($7.5 billion in 1983). The largest category of products imported are metal structures ($4.7 billion), other fabricated metal products and base metal products ($3.1 billion).

A few developing countries and areas have developed sizeable exports in this industry. The Republic of Korea's exports of metal manufactures totalled $1.4 billion in 1984, including metal structures and parts ($594 million), wire, cables and ropes ($319 million), steel and copper nails and nuts ($152 million), and cutlery ($134 million). Singapore's exports of metal manufactures were worth $596 million in 1984, including tools worth $120 million and metal structures worth $101 million. Hong Kong's exports of metal manufactures totailed $210 million in 1984, including locksmith wares etc. worth $86 million. Brazil's exports of metal manufactures in 1984 were worth $199 million. Egypt's exports, worth $208 million in 1984, consisted mostly of metal structures.

(b) *Future prospects*

The output of the metal products industry in developing countries is expected to increase by 6.1 per cent in 1987 and 6.2 per cent in 1988. In developed countries output increases of 1.9 per cent in 1987 and 2.3 per cent in 1988 are forecast.

The outlook for this industry in developing countries depends on prospects in Latin America (more than 50 per cent of the South's output) and in East Asia (25 per cent of total output). Further growth in output is forecast for Latin America (4.9 per cent in 1987 and 5.7 per cent in 1988) and for South-East Asia (7.8 per cent in 1987 and 6.7 per cent in 1988). Faster growth is forecast for the Indian Subcontinent (7.2 per cent in 1987 and 6.4 per cent in 1988), in North Africa (6.8 per cent in 1987 and 6.9 per cent in 1988) and in Western Asia (7.7 per cent in 1987 and 7.6 per cent in 1988). Slower progress is expected in Tropical Africa (2.4 per cent in 1987 and 3.8 per cent in 1988).

The metal products industry so far appears to be strong in some developing countries and areas (Argentina, Brazil, Colombia, Hong Kong, India, Iran (Islamic Republic of), Mexico, Peru, Philippines, Republic of Korea, Taiwan Province, Turkey and Venezuela). Together they account for more than 80 per cent of the South's output. The remaining developing countries rely mainly on imports, and it is in those countries that UNIDO's technical co-operation activities have been concentrated.

In the long term, nearly all developing countries will need to establish an industry producing at least a limited range of metal products. The construction industry requires a local capability to manufacture metal structures. Local production of more complex products depends on the development of skills in product design and engineering and metal-working. In the long term, CAD and automatic machinery will help ensure greater accuracy in the manufacturing process, but the basic engineering skills need to be developed first.

A larger number of developing countries should eventually be capable of emulating the performance of Argentina, Brazil, India, Mexico and the Republic of Korea, which have established a substantial metal products industry manufacturing a diversified range of metal products.

(c) *UNIDO activities*

UNIDO technical co-operation aims at imparting the basic design and metalworking skills that this

Table 89. Selected UNIDO technical co-operation projects related to the metal products industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Bangladesh	UNDP**	1984—	Assistance to the Chittagong Dry Docks and Heavy Steel Structure Works
Cuba	UNDP	1985—	Cost-reduction of maintenance in the sugar industry by means of research for the selection of corrosion-resistant materials
India	UNDP**	1982—	Assistance to the metalworking industry in India—computer aids
	UNDP**	1982—	Assistance in the setting-up of the Central Institute of Hand Tools
	UNDP*	1985—	Establishment of a metal handicraft service centre at Moradabad
Namibia	IDF*	1985—	Assistance to the South-West Africa People's Organization (SWAPO) in the establishment of a wood and metalworking workshop
Nicaragua	UNDP	1985—	Asesoria para el establecimiento de un taller de matriceria
Republic of Korea	UNDP	1986—	Establishment of the computer-aided design (CAD) section within the dies and moulds centre of the Korea Institute of Machinery and Metals
Thailand	UNDP	1986—	Development of tool and die industry
Trinidad and Tobago	UNDP**	1985—	Tool manufacturing and product development for metalworking and plastics industries
Tunisia	UNDP	1985-1986	Unité de conception et de fabrication assistée par ordinateur de moules au sein du CETIME/DO—CFAO

For footnotes see table 46.

industry requires. In Bangladesh, UNIDO has provided assistance in the manufacture of heavy steel structures at Chittagong. UNIDO helped Thailand to develop its tool and die industry, and assisted Trinidad and Tobago in tool manufacture and product development for the metalworking industry. In India, UNIDO assisted in the setting up of the Central Institute of Hand Tools (see table 89).

The UNIDO Investment Promotion Service promoted a small investment in wheelbarrow manufacturing in China. In India, investment of $1.4 million in the production of dies and moulds was promoted. The UNIDO portfolio of investment opportunities also includes several projects in this industry, such as one in which an Indonesian entrepreneur seeks a foreign partner for the manufacture of boilers required by the fertilizer and other industries.

24. Non-electrical machinery (ISIC 382)

Engines and turbines
Agricultural machinery and equipment
Metalworking and woodworking machinery
Special industrial machinery
Office, computing and accounting machinery
Other machinery and equipment

(a) *Present situation*

The non-electrical machinery industry, or, as it is more frequently called, the mechanical engineering industry is making a growing contribution to total manufacturing output in many developed countries. Between 1975 and 1985, its contribution increased from 11.6 to 12.6 per cent in North America, from 16.7 to 21.4 per cent in Eastern Europe and the USSR, and from 10.4 to 12.4 per cent in Japan. Its contribution, however, fell from 12.2 to 12.1 per cent in Western Europe and from 7.8 to 5.5 per cent in other developed countries.

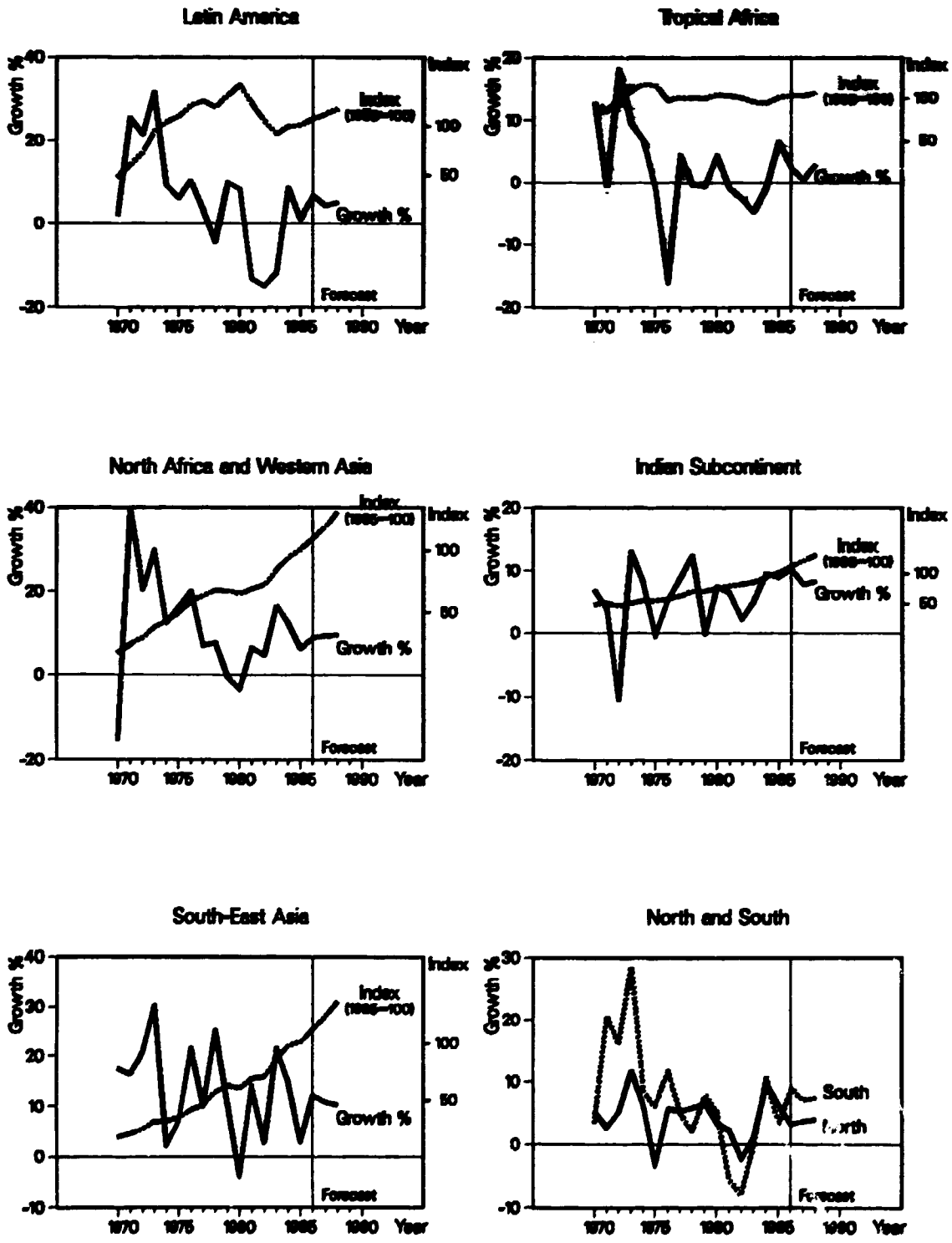
In Latin America, its contribution was 6.3 per cent in 1975 and 6.4 per cent in 1980, but fell sharply to 4.4 per cent in 1985, confirming the still inadequate level of new investment in that region. In Africa, the contribution fell from 1.5 per cent in 1975 to 1.2 per cent in 1980 and 1.1 per cent in 1985. There were steady increases in the other developing regions in the period 1975-1985: on the Indian Subcontinent from 4.3 to 5.6 per cent; in South-East Asia from 3.6 to 4.1 per cent; and in North Africa and Western Asia from 3.2 to 3.8 per cent.

Between 1970 and 1985, this industry's output increased faster in developing countries than in developed ones (7.0 per cent versus 4.2 per cent per annum). Nevertheless, the share of the former group in world output remained very low: 2.6 per cent in 1970 and 3.9 per cent in 1985 on the basis of a sample of 82 countries, or from 3 to 4.2 per cent on the basis of data from 165 countries (see figure XLII for regional trends).

In developed countries, the output of this industry falls during a recession and picks up sharply in the recovery. In 1983, output was 10 per cent below the 1980 level in the EEC (12 countries), 4 per cent down in the United States, but 8 per cent up in Japan. In the United States, output jumped almost 20 per cent in 1984 and rose a further 2.4 per cent and 5 per cent in 1985 and 1986 respectively—just enough to regain the 1980 level. In Japan, output continued to rise steadily, increasing by almost 15 per cent in 1984 and almost 9 per cent in 1985; but in 1986 output growth slowed to 2 per cent.

In developing regions, there was a strong contrast in the industry's performance. In Latin America, output in 1983 was 35 per cent below the 1980 level. In 1986, it was still 25 per cent below the 1980 level. In all other regions, except Tropical Africa (where output has been stagnant), output has grown steadily and rapidly between 1980 and 1986, namely by 50 per cent in the Indian Subcontinent, by more than 100 per cent

Figure XLII. Non-electrical machinery (ISIC 382)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

in East Asia and South-East Asia, by 70 per cent in Western Asia, and by 50 per cent in North Africa.

The contribution made by this industry is still low in all developing countries for many reasons. First, it is a most difficult industry to enter, requiring sophisticated skills in design, product engineering and manufacture. Secondly, few countries, whether developed or developing, have a large enough market to justify local production of the entire range of mechanical engineering products; among the former group there is a considerable degree of specialization and two-way trade of the "intra-industry" type. Thirdly, established producers with well-proven designs and good after-sales service are preferred over new suppliers.

For all these reasons, the industry in developing countries has had to follow a more or less "forced" development path, in the sense that local industry is promoted actively through tariffs or import licensing controls, which oblige it to rely on local suppliers rather than imports in cases where the local industry can produce at the required standard. India launched such a policy in the early 1960s and pursued it rigorously for more than 20 years. In that country the industry's contribution to total manufacturing output was almost 6 per cent in 1985, higher than in any other developing country except Brazil (11 per cent), where a policy of protecting the emerging capital goods industry and indigenizing an increasingly sophisticated technological base for it has been steadily pursued.

In 1980, four developing countries (Argentina, Brazil, India and Mexico) accounted for 70 per cent of the output of the non-electrical machinery industry in the South; another four (China, Republic of Korea, Singapore and Turkey) contributed a further 15 per cent. The other developing countries relied basically on imports. As a result, almost 60 per cent of the demand for non-electrical machinery in developing countries was met by imports (see table 90).

As data on the composition of the output of the non-electrical machinery industry is not available for most developing countries, import statistics may be used to suggest the composition of demand in those countries. Table 90 suggests the following percentage shares:

General-purpose machinery and equipment	45
Specialized industrial machinery	21
Engines and turbines	14
Office and data-processing equipment	12
Metal and wood-working machines	7

Many developing countries have started to manufacture some general-purpose machinery and equipment. The largest product groups under this heading are mechanical-handling equipment, including cranes, industrial tractors and fork-lift trucks; pumps of all types, including gas and air compressors; heating and cooling equipment, including cooking ranges, ovens, air conditioners and refrigerating equipment; common parts of machinery, such as ball- and roller-bearings, piston rings and valves; and the broad range of machinery rebuilding and repairing equipment. Also included (an important industry in some developing

Table 90. Developing countries' imports of non-electrical machinery, 1981-1985

(Billions of dollars)

ISIC group	*Non-electrical machinery*	*1981*	*1982*	*1983*	*1984*	*1985[a]*
3821	Engines and turbines					
	Steam-boilers and engines	1.88	2.19	1.73	1.81	1.51
	Engines and motors n.e.s.	2.08	2.47	1.45	1.87	2.13
3822	Agricultural machinery					
	Tractors	2.25	1.74	1.14	0.99	0.85
	Other	1.18	0.89	0.77	0.79	0.86
3823	Metal and wood-working machinery					
	Machine tools	2.40	2.28	1.93	2.02	2.32
	Other machinery	1.11	0.93	0.67	0.85	0.86
3824	Special industrial machinery					
	Textiles and leather machinery	3.33	2.67	2.18	2.55	3.14
	Paper mill equipment	0.63	0.51	0.43	0.41	0.49
	Printing, bookbinding equipment	0.81	0.76	0.54	0.57	0.65
	Food-processing machinery	1.02	0.93	0.74	0.70	0.80
	Other	5.56	5.44	4.51	4.98	5.45
3825	Office and data-processing equipment					
	Data-processing equipment	1.35	1.56	1.59	2.18	2.54
	Office machinery	0.87	0.79	0.69	0.80	0.90
	Parts	1.23	1.22	1.56	2.19	2.47
3829	Other machinery and equipment					
	Mechanical-handling equipment	4.20	3.76	2.81	2.72	2.66
	Pumps	5.92	5.38	4.36	4.41	4.47
	Heating, cooling equipment	5.83	5.19	4.43	4.22	4.03
	Other tools	1.99	1.78	1.57	1.67	1.65
	Parts	4.39	3.89	3.23	3.57	3.57
	Total	48.03	44.38	36.39	39.30	41.35

Source: UNIDO trade data base, based on the Standard International Trade Classification Revision 2.

[a]As this column is based on preliminary figures, not all importing countries are included.

countries) is that part of the armaments industry which manufactures small arms, heavy ordinance and artillery.

Many of the general purpose products used in the mechanical engineering industry are labour-intensive and their production can be profitably redeployed to developing countries. One of Japan's largest manufacturers of bearings has made that country's biggest investment in Thailand. A bearings plant which it set up in 1980 now employs 4,000 workers. It produces entirely for export markets, mainly Japan itself. Exports were valued at $50 million in 1985 and about $70 million in 1986. This has helped reduce Thailand's $1 billion trade deficit with Japan [138].

The machine tool industry is a small part (perhaps 5 per cent) of the mechanical engineering industry for which output data are collected. Tables 91 and 92 list the 1986 output of the largest producers among developed and developing countries and areas. The large share of the Federal Republic of Germany and Japan in world output is due to those countries' substantial exports of approximately $3 billion each. Switzerland and the German Democratic Republic also produce mainly for export, exporting about $1.3 billion each in 1986. The other developed countries are all net importers of machine tools, on a considerable scale. Among developing countries and areas, Taiwan Province exports 68 per cent of its output but the others are net importers on a small scale.

(c) *Future prospects*

The output of the non-electrical machinery industry in developing countries is expected to increase by 4.5 per cent in 1987 and 4.6 per cent in 1988. Output growth in developed countries is forecast at 3.8 per cent in 1987 and 4.2 per cent in 1988. The fastest growth in this industry's output in 1987 and 1988 is expected in North Africa (9.7 and 10.1 per cent respectively), in the Indian Subcontinent (7.8 and 8.2 per cent respectively), in South-East Asia (10.8 and 10.2 per cent respectively) and in Western Asia (9.1 and 9.3 per cent respectively). Further recovery in Latin America is forecast, with output gains of 4.2 per cent in 1987 and 5.0 per cent in 1988. In Tropical Africa, the outlook is for a small increase in output (0.5 per cent in 1987 and 2.8 per cent in 1988).

Table 91. Developed countries: 10 largest producers of machine tools in 1986

Country	*Output in millions of dollars*
Japan	7 082
Germany, Federal Republic of	5 210
USSR	3 657
United States	2 830
Italy	1 645
Switzerland	1 439
German Democratic Republic	1 295
United Kingdom	782
France	693
Czechoslovakia	383
	29 232

Source: American Machinist and Automated Manufacturing, February 1987.

Table 92. Developing countries and areas: 6 largest producers of machine tools in 1986

Country or area	*Output in millions of dollars*
Brazil	370
Taiwan Province	361
India	250
Republic of Korea	242
Singapore	34
Mexico	18

Source: American Machinist and Automated Manufacturing, February 1987.

In developing countries, this industry should continue to grow rapidly, that is, by at least 8 per cent per annum and faster than the rate of growth of manufacturing output as a whole. It is the least-developed industry in most of these countries, which still rely on imports for more than 90 per cent of their requirements of mechanical engineering goods.

Having acknowledged the need for faster growth, the preconditions for facilitating such growth must also be satisfied. Basically, the development of this industry is an exercise in organization and the progressive building up of human skills. Product designs can be imported at the early stages, but an indigenous and more self-reliant development requires a high level of human skills and continuing research and development over a period of decades rather than years.

Recent technological advances have made the production of mechanical engineering goods a more flexible operation, but a much more capital-intensive one. The application of CAD/CAM systems has the greatest potential in this industry. Numerically controlled (NC) machine tools and work stations eliminate human error in the machining of mechanical parts. Developing countries have the opportunity to benefit from this revolution and embrace a process that can be programmed to manufacture small batches of a wide range of machine components or pieces of equipment. The organization of the industry in developing countries can benefit from other countries' experience. As engineering skills are in short supply in the former countries, the production of mechanical engineering goods could be concentrated in one or more production centres. Different enterprises could then share the cost of the expensive but productive automated machines that the industry has introduced in developed countries.

In the capital goods industry of Latin America, the recession lasted from 1980 to 1985. From 1986 to 2000, there needs to be sustained expansion. Intra-regional trade will develop and bilateral agreements such as the one between Argentina and Brazil may facilitate complementary patterns of specialization. The capital goods industry has continued to grow rapidly in Asia, but mainly in two countries, India and the Republic of Korea. Complementary patterns of specialization will emerge in time, but if growth is to be accelerated they may need to be planned rather than left to market forces. In North Africa, Western Asia and Tropical Africa, output should increase very rapidly from a low base. The countries which partici-

pate in this advance will be those that have a large domestic market or make arrangements for complementary patterns of development with neighbouring countries. Development will need to be forced by import controls and stimulated by a greater inflow of technical collaboration than that experienced thus far.

(c) *UNIDO activities*

In developing countries, there is now a need to make an overall assessment of the stage reached and to identify gaps that need to be filled in the range of mechanical engineering goods being produced. In the process of assisting a number of those countries to plan the development of their capital goods industry, UNIDO has developed an approach that can be applied to various national and regional situations. The long-term demand for capital goods in Latin America is being examined in a joint ECLAC/UNIDO study. And technical advice on the development of heavy industries has been provided to Algeria, Tunisia and Pakistan (see table 93).

Some of UNIDO's technical co-operation projects in 1986 were in the area of CAD/CAM systems and the related need to introduce computer-controlled machining centres and NC machine tools. Other projects were related to the improved design and production of specific products such as bearings, gears and internal combustion engines.

Several projects are related to the development of local production of various types of agricultural machinery and equipment. For least-developed countries such as Burkina Faso, Ethiopia, Haiti, Lesotho and Togo the emphasis is on repair and maintenance and the production of simple agricultural tools and implements. In countries that have a well established agricultural machinery industry, such as China and Poland, the emphasis is on testing existing equipment and improving designs and production methods.

A key project for rural development is the local manufacture of water pumps. In a World Bank/UNDP "handpump project", 70 pump designs have been tested in 17 countries in three continents. Reports on the first phase describe the home-developed "Jetmatic" pump in the Philippines, a high-lift pump manufactured in Thailand, an "India Mark II" pump widely used in Africa and Asia, and a low-lift direct-action pump developed in Bangladesh. The project now moves into its second phase where goals include increased co-operation on low-cost technologies for local manufacturers; testing in collaboration with government experts; and the provision of guidelines to improve borehole design and maintenance [139].

Table 93. Selected UNIDO technical co-operation projects related to the non-electrical machinery industry

Region, country or area	*Source of funds*[a]	*Executing period*[b]	*Project title*[c]
Algeria	UNDP*	1984-1986	Assistance préparatoire à l'établissement d'un programme intégré d'actions pour le développement et la promotion du secteur du machinisme agricole
	UNDP	1985-1986	Immediate assistance to the "Institut national d'etudes et de recherches en maintenance" in the field of maintenance engineering techniques
	UNDP	1985-1986	Assistance à l'office national du matériel agricole pour l'étude de la gestion des stocks de pièces détachées et de son informatisation
	UNDP	1985—	Assistance à l'entreprise nationale d'organisation et d'information du secteur de l'industrie lourde
Angola	UNDP*	1982—	Maintenance and repair centre
Bangladesh	UNDP*	1979-1986	Assistance in operation of Bangladesh Machine Tool Factory
	UNDP**	1984—	Assistance to the Bangladesh diesel plant
Bhutan	UNDP	1983-1986	Feasibility and design of an integrated maintenance system
Bulgaria	UNDP*	1981—	Numerical control/computer-aided manufacturing metalworking development centre
	UNDP*	1982—	Strengthening of the Institute for Industrial Cybernetics and Robotics
Cameroon	UNDP*	1979-1986	Renforcement de l'atelier de Bassa—assistance au CAPME
China	UNDP*	1980-1986	Agricultural machinery testing centre and technical service to industry
	UNDP*	1980—	Training and development of microcomputer systems applications
	UNDP**	1981—	Quality control and testing of filters for tractor engines
Democratic People's Republic of Korea	UNDP**	1984—	Development of numerically controlled machine-tools
	UNDP	1985—	Dynamic testing of coal mining machines
Ecuador	UNDP	1982-1986	Assistance in maintenance and repair of oil refineries
Egypt	IDF	1986—	Assistance for introduction of computer-aided engineering technology within industries in Egypt and other Arab countries
	UNDP	1986—	Development of small and medium feeder industries in the automotive manufacturing sector

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Ethiopia	RP	1985-1986	Preliminary assistance to the utilization of solar energy in resettlement areas of Ethiopia
	UNDP	1983—	Preparatory assistance for the establishment of an engineering design and manufacture technological centre and a pilot plant for agricultural machinery and implements manufacture
Guyana	UNDP	1982-1986	Assistance to GUYUSCO Central Repair Workshop
Haiti	RP	1984-1986	Assistance préparatoire à l'IDAI : promotion, adaptation et fabrication d'outillages agricoles simples
	UNDP	1984—	Assistance à la BNDAI—production et promotion de matériels agricoles simples
Hong Kong	RP	1985-1986	Training in computer-aided design and manufacturing
	UNDP	1984—	Application of computer-aided design and manufacturing to manufacturing activities
Hungary	UNDP*	1982—	Introduction of computer-aided design training and education
India	UNDP**	1979-1986	Instruments design, development and facilities centre, Ambala
	UNDP**	1979—	Sewing machinery development centre
	UNDP*	1982—	Appropriate automation promotion programme
	UNDP	1982—	Application of alternative fuels for internal combustion engines
	UNDP**	1982—	Computer-aided design programme
	UNDP**	1984—	Microprocessor applications engineering programme
Iraq	UNDP	1985-1986	Introduction of a computerized maintenance system in textile industry
	UNDP**	1977—	Specialized Institute for Engineering Industries
	IDF	1986—	Assistance for introduction of computer-aided engineering technology within industries in Iraq and other Arab countries
Jordan	OTF*	1982—	Assistance to the RSS: manufacturing of solar water heater for industrial application
Lesotho	IDF	1980-1986	Assistance to the Lesotho National Development Corporation in manufacturing of agricultural tools and implements
	UNDP*	1984—	Assistance in manufacturing in agricultural equipment
Madagascar	UNDP*	1982—	Programme d'appui en matière de maintenance industrielle (assistance préparatoire)
	UNDP	1984—	Programme de recherche/développement en énergies nouvelles et renouvelables
Malaysia	UNDPTF/ UNDP**	1981—	Assistance to EMAMA project
	IDF*	1985—	Création d'une unité de production en série de pompes à eau manuelles de type India et Mali
Morocco	UNDP	1986—	Immediate assistance to AGA-Ingénierie for the establishment of computerized engineering data bank
Pakistan	UNDP*	1975—	State Heavy Engineering Corporation
Poland	UNDP*	1982—	Strengthening research and design in the agricultural machinery industry
Republic of Korea	UNDP**	1974-1986	KIST: Industry co-operative productivity programme (mechanical engineering and related industries)
	UNDP*	1982—	Mechanical engineering computer application programme
	UNDP	1983—	Numerical control centre
Romania	UNDP	1985—	Introduction of modern testing technology (field data acquisition, simulation and testing) to improve agricultural machinery (tractors)
Senegal	UNDP*	1982—	Entretien du matériel d'irrigation et de culture dans la vallée du fleuve Sénégal
Somalia	IDF*	1980-1986	Establishment of a pump repair section within the existing mechanical workshop and foundry in Mogadiscio
Togo	UNDP	1979-1986	Assistance au centre national de promotion des petites et moyennes entreprises et extension des activités des domaines industriels
	COFN	1983—	Assistance préliminaire en vue de la création d'un centre national de conception et de fabrication technique
	UNDP/ UNDPTF*	1983—	Assistance to UPROMA
Tunisia	UNDP	1986—	Assistance on preparation and development of prototyping and manufacturing process of capital goods
Turkey	RP	1985—	Assistance in establishing a computer-aided design and manufacturing training programme
Uganda	UNDP	1980—	Assistance to the Soroti Agricultural Workshop: manufacture of low-cost agricultural tools, implements and simple machines

Table 93 *(continued)*

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Viet Nam	UNDP**	1980—	Rehabilitation of sugar mills including progressive local manufacture of spare parts and equipment
	UNDP**	1982—	Repair and maintenance centre and spare parts production for rice mills
Africa	RP*	1985	Establishment of a training capacity and capability in the field of design and production of agricultural machinery and implements in Cameroon, Sudan and the United Republic of Tanzania
	IDF	1983-1986	Assistance to the African National Congress in the establishment of a mechanical workshop
Asia and the Pacific	IDF	1983-1986	Manufacturing and application of solar collectors using selective absorbing technology training course, Melbourne
Interregional	IDF	1982-1986	Joint UNIDO/Norway workshop on offshore drilling industries for developing countries, Oslo, 26-29 August 1986
	IDF	1983-1986	Sixth in-plant group training programme for engineers in the field of engineering and industrial design, Cairo, 23 September-4 November 1985
	IDF	1984—	Technical co-operation between the Institute for Industrial Cybernetics and Robotics (Bulgaria) and the Instrument Design, Development and Facilities Centre (India)
	IDF/RP	1985—	Training course in numerical control and computer numerical control and machine tool operation
	IDF	1986—	In-plant group training programme in the field of maintenance, repair and overhaul of diesel engines, Shanghai, 18 July-24 October 1986

For footnotes see table 46.

25. *Electrical machinery (ISIC 383)*

Equipment for generating and distributing electric power

Radio, television sets, electronic components

Household electrical appliances

Other electrical apparatus such as lighting equipment

(a) *Present situation*

The electrical machinery industry contributes 6.1 per cent of manufacturing output in developing countries compared with 10.2 per cent in developed countries. Between 1970 and 1985, its output increased faster in developing countries than in developed ones (8.5 versus 5.7 per cent per annum). As a result, the former's share of world output increased in that period from 5.0 to 7.2 per cent on the basis of a sample of 82 countries, or from 5.7 to 7.9 per cent on the basis of data from 165 countries (see figure XLIII for regional trends).

The most remarkable expansion in this industry has taken place in Japan, where between 1980 and 1985 output increased by 11.3 per cent and the industry's contribution to total manufacturing output increased from 11 to 23 per cent. In Western Europe, in the same period, output increased by 15 per cent and the share in total manufacturing increased from 9.3 per cent in 1980 to 10.4 per cent in 1985. In North America, 1980-1985 output increased by 30 per cent and the share in total manufacturing rose from 8.4 to 9.8 per cent.

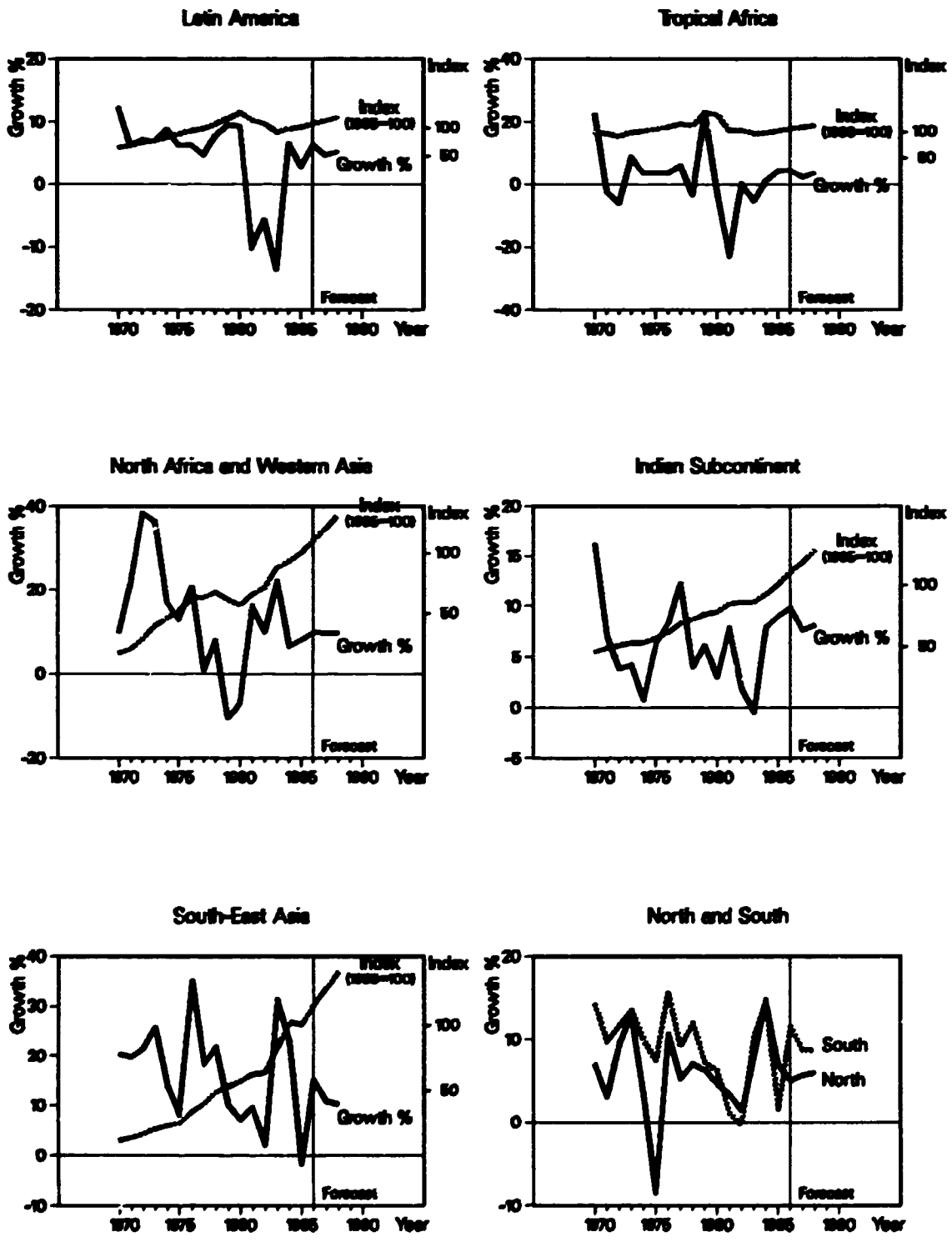
In Latin America, output fell by 20 per cent between 1980 and 1985. In East Asia and South-East Asia, however, it increased by 77 per cent in the same period. Between 1975 and 1985 the industry's contribution to manufacturing output increased from 12.5 to 26 per cent in Singapore, and from 7 to 14 per cent in the Republic of Korea. In Hong Kong, however, it fell from 16 to 14 per cent in the same period.

Electronics, including household electronic goods such as television sets and radios, account for over half of the output of the electrical machinery industry in most countries. In countries where a significant part of the electronics output is exported, such as Japan and the Republic of Korea, the contribution of the electronics branch is even higher (up to 80 per cent). The other half of the output of this industry can be divided into four categories. The first covers the heavy electrical equipment needed to generate and distribute electric power, such as electricity generators, transformers and switchgear, as well as electric transmission equipment such as wires and cables. The second category covers the manufacture and repair of electric motors of all sizes. The third includes the manufacture of electric appliances for household use such as electric toasters and vacuum cleaners. The fourth group comprises other electrical equipment such as storage batteries, electric lamps and tubes, electric fixtures and lamp sockets, connectors and insulators.

The last group is usually one in which local production first starts in developing countries. Manufacturing usually starts with storage batteries, electric wires, electric fixtures and lamp sockets, and then moves on to electric lamps and tubes which require more sophisticated technology.

The broader development of this industry has so far been concentrated mainly in 10 developing countries which produced more than 80 per cent of the South's output in this industry in 1985. These 10 countries produce a full range of heavy electric equipment as well as electric appliances and a range of electronic products. However, as all other developing countries remain dependent on imports, imports account for about one third of the supply of the South's total requirements. The South's imports of electrical goods

Figure XLIII. Electrical machinery (ISIC 383)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/IPR/GLO.

rose in value from $27 billion in 1979 to $36 billion in 1984 (see table 94).

The largest category of imports, worth $10.9 billion in 1984, was equipment for electric power generation and distribution. The next largest category of imports was telecommunications equipment, where imports grew from $5.8 billion in 1979 to $7.5 billion in 1984. Another fast-growing category was imports of transistors, semi-conductors etc. used in part by export-oriented industries; imports in 1984 at $7.9 billion were more than double the 1979 level, despite a downward trend in prices. Increased local production in developing countries and lower prices caused a drop in the value of imports of television sets and radios from $3.5 billion in 1981 to $2.5 billion in 1984.

In Japan, electronics products now account for 86 per cent and heavy electrical machinery for 14 per cent of the output of the electrical industry. The output of the electronics industry was divided into 36 per cent for industrial electronics, 28 per cent for consumer electronics and 36 per cent for electronic components. Further rapid growth is expected. For example, production of industrial electronic goods is forecast to grow by 17 per cent per annum up to 1995 with products not yet on the market expected to account for 37 per cent of the industry's output in 1995 [140].

Taiwan Province has made the electronics industry a key part of its industrial development strategy. In 1983, the industry accounted for almost 12 per cent of manufacturing output and 14 per cent of employment in manufacturing. In 1984 the 2,300 firms in this industry had 250,000 employees. Its output in 1984 was valued at $7.3 billion, including $2.0 billion of consumer electronics products, $0.8 billion of telecommunications and industrial electronics products and $4.5 billion of electronic parts and components. Exports of electronics products increased from $1.3 billion in 1977 to $3.0 billion in 1980 and $5.4 billion in 1984 [141].

Table 94. Developing countries' imports of electrical machinery, 1979, 1981 and 1984

(Billions of dollars)

Electrical machinery	*1979*	*1981*	*1984*
Electrical industrial machinery etc.			
Electric motors and generators	2.37	3.49	2.36
Other power-generating machinery	0.27	0.32	0.36
Electric transformers etc.	1.42	1.64	1.39
Electric switchgear, relays etc.	3.54	4.78	2.13
Equipment for electricity distribution	2.05	2.77	2.15
Subtotal	9.65	13.00	10.86
Radio, television and telecommunications equipment			
Television receivers	1.22	2.06	1.56
Radios	1.10	1.51	0.96
Gramaphones, tape recorders	0.66	1.40	1.45
Telecommunications equipment	5.76	6.86	7.48
Medical and X-ray equipment	0.48	0.66	0.69
Transistors, valves etc.	3.55	4.87	7.86
Subtotal	12.79	17.38	20.00
Household electrical appliances	1.36	2.02	1.50
Other electrical machinery, batteries, lamps etc.			
Electrical parts of machinery	3.14	3.57	3.45
Grand total	26.94	35.97	35.81

Source: UNCTAD/UNIDO: Trade statistics data base.

The Republic of Korea is also among the most successful in developing an export-oriented electronics industry. Exports in 1985 were worth $4.7 billion, slightly up on the 1984 level. Exports of electronics components (including semi-conductors) were worth about $2.0 billion, consumer electronics equipment (televisions, video-recorders etc.) $1.6 million, home electric appliances about $0.4 billion and industrial electronics about $0.7 billion [142].

The Republic of Korea became the world's third largest producer of semi-conductors in 1985. Production was worth $0.74 billion compared to the $9.0 billion production of the United States and $7.6 billion production of Japan. In that year, the Federal Republic of Germany's production was $0.72 billion and the United Kingdom's $0.58 billion [143]. The Republic of Korea's production expanded in 1986 and 1987, helped in part by the trade dispute between the United States and Japan over the pricing of products exported from Japan.

Malaysia's industrial development strategy has attached great importance to the electronics industry. By 1983, the industry employed 80,000 or 12 per cent of employment in the manufacturing sector; value added in electronics was 12.7 per cent of total manufacturing output in 1981; electronics accounted for 36 per cent of the value of exports of manufactured goods in 1981. About 75 per cent of the industry's output is in semi-conductor assembly and testing and 90 per cent of exports are in this field; consumer electronics account for only 10 per cent of output and industrial electronics for 5 per cent. Hence, the aim over the period 1986-1995 is to broaden the range of electronic products produced and reduce the role of semi-conductors for which international demand happens to be cyclical [144].

In Pakistan, the electronics industry received special emphasis in the 1983-1988 Development Plan when its output was expected to grow 12 per cent per annum. The principal items produced are radio and television sets, communications equipment, telephone exchanges and telephones. Although some electronic components are manufactured in Pakistan, most producers import complete kits. Four plants have been established in the export processing zone. The plan emphasizes building up research and development capacity to make the industry more self-reliant.

The electrical industry has been less buoyant in Latin America. Output of television sets fell 50 per cent between 1980 and 1984 in Mexico and by 30 per cent in the same period in Brazil. Output of radio receivers fell 60 per cent in Mexico between 1980 and 1984. Output of washing machines fell by 50 per cent between 1980 and 1984 in Brazil and output of both washing machines and refrigerators fell by 50 per cent in Mexico in this period. Heavy electrical equipment also suffered for weakness in demand; output of transformers (5 KVA or less) in Brazil fell 50 per cent between 1980 and 1984. From these low levels, output began to recover in 1985 and 1986 and should pick up further in 1987 and 1988.

In the North Africa and Western Asia region, development of this industry is at an early stage. For example, Iraq produces batteries, electric bulbs, electrical meters and transformers as well as consumer goods such as electrical ceiling fans and electric irons. Egypt and Turkey have also established a basic electrical industry, but production is negligible in most other Arab countries. Hence, considerable importance is attached to recent UNIDO studies of opportunities for regional co-operation in the development of the capital goods and heavy engineering industries [145]. The groups of electrical products covered include telecommunications equipment, telephone cables, power cables and electric power equipment. The manufacture of telephone exchanges, telephone instruments and telephone cables is the subject of pre-feasibility studies in the second volume.

(b) *Future prospects*

The output of the electrical machinery industry in the developing countries is expected to increase by 8.7 per cent in 1987 and 8.6 per cent in 1988. In developed countries, output is expected to increase by 5.9 per cent in 1987 and 6.2 per cent in 1988. Thus, the industry will continue to be one of the fastest-growing in both North and South.

Among the developing regions, output is expected to grow fastest in East and South-East Asia (10.8 per cent in 1987 and 10.1 per cent in 1988). Growth is expected to be rapid in the Indian Subcontinent (7.5 per cent in 1987 and 8.1 per cent in 1988) and in Western Asia (10.3 per cent in 1987 and 1988), and in North Africa (6.9 per cent in 1987 and 7.0 per cent in 1988). In Tropical Africa, growth is at less than half this pace (2.3 per cent in 1987 and 3.5 per cent in 1988 is foreseen). In Latin America, slower-than-average growth is forecast (4.5 per cent in 1987 and 5.1 per cent in 1988).

The electrical industry has two parts: the traditional part which produces equipment for generating and distributing electricity and the wide range of electronic products and electrical household goods that consumers require, and the modern part which includes telecommunications equipment, computers and other electronic equipment, where a growing range of new technologies and new products are regularly emerging.

The traditional part of the industry will grow by about 7 per cent per annum in developing countries, twice the rate expected in developed countries where basic demand for electricity has been satisfied. Over the next 15 years, a broader group of developing countries will aim to manufacture a wider range of electrical equipment.

The development of the modern part of the industry, exposed to a continuing stream of advances in electronics, has been slower in developing countries than it should be. Between 1975 and 1985, the labour and skill-intensive parts of the manufacture of electronic components such as semiconductors and integrated circuits was started in a number of Asian developing countries. But technological progress is making the production of these products more complex and more highly automated and only a few developing countries have progressed far enough to undertake their own research and development in this field. In the future, a much wider range of developing countries will need to develop the human skills needed to keep abreast of new developments in the electronics industry. For example, the new industrial strategy of Singapore calls for more concerted moves into information technology, robotics and artificial intelligence, microelectronics and laser and optics technology. The switch is to be spearheaded by the Singapore Technology Corporation established in 1983 [146].

Telecommunications systems remain unreliable and under-developed in most developing countries. Modern fibre optics and digital technologies are bringing about enormous improvements in the capacity of these systems. It is hoped that a certain range of developing countries will continue to keep up with these developments over the next 15 years.

Developing countries and areas have become important suppliers of television sets and radios to world markets. The range of products which they export may broaden in the future, concentrating on mass-produced items such as consumer household articles and electrical appliances. In 1987, the privilege of duty-free access to the United States market under the Generalized System of Preferences will be withdrawn from the computers and other electronic products and refrigeration equipment imported from the Republic of Korea and the electrical appliances imported from Taiwan Province [147].

(c) *UNIDO activities*

One group of UNIDO projects deals with the generation and use of electric power. The UNIDO programme to help least developed countries establish mini-scale, hydro-electric power plants which was started in 1982 continued in 1986; for example, the project to install mini hydro-power plants in the rural areas of Ethiopia was completed. Another group concerns development of renewable sources of electric power, an example being the project on the manufacture of solar water heaters for industrial use in Jordan. The UNIDO assistance on energy-saving measures in the industrial sector, which started when oil prices rose sharply in 1979, still continues in countries such as Brazil, Chile, Egypt and Pakistan.

Practically every developing country recognizes the importance of having its own electronics industry, one of the building blocks for industrialization for the coming decades. A few countries have sought UNIDO advice on how to develop this industry; in 1986 UNIDO electronics experts were advising El Salvador. Countries at a more advanced stage, like India, have established an electronics service and training centre with UNIDO support. Malta has been assisted with the maintenance and servicing of electronics equipment.

An essential step in the design, development and production of electrical products is testing for performance and safety. Many developing countries have requested a UNIDO contribution in this field. Mexico has been helped to establish a specialized laboratory for the testing and development of electrical equipment. The Democratic People's Republic of Korea has been helped to test components for electric power systems. Viet Nam has been helped to design high voltage capacitors. And China has been helped to

Table 95. UNIDO-promoted investments in the electrical machinery industry, 1985 and 1986

Country and year	Product	Investment (millions of dollars)
1985		
China	Integrated circuits	0.2
	Thyristors	6.0
India	Hydroturbines	6.0
	Capacitors	...
Nepal	Voltage stabilizers	1.0
	Electric motor	3.0
1986		
Bangladesh	Electric storage batteries	0.8
Cameroon	Electric storage batteries	0.2
China	Electric batteries	0.8
India	Electronic fuse gears	3.0
	Electronic components	4.5
Saint Christopher and Nevis	Electrical components	3.5

establish a laboratory for testing consumer electronic products.

UNIDO has also been requested to help move on to higher-technology sub-sectors. Examples include the manufacture of dry batteries in Iraq; the production of electrical transformers in the Democratic People's Republic of Korea; and the application of fibre-optics technology (the most advanced form for transmitting voice and data by cable) in India [148].

For the establishment of new plants for electrical equipment, foreign collaboration is often the best route. In 1985 and 1986, the UNIDO investment promotion service promoted investment in 12 projects in this industry (see table 95). Other UNIDO co-operation projects are listed in table 96.

The five different levels of sophistication and complexity in technology required to produce a complete range of heavy electrical equipment was examined by UNIDO for the Second Consultation on the Capital Goods Industry.* UNIDO's studies of the electrical

*See the Report of the Second Consultation on the Capital Goods Industry, with Special Emphasis on Energy-Related Technology Equipment (ID/338).

Table 96. Selected UNIDO technical co-operation projects related to the electrical machinery industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Brazil	UNDP	1982-1986	Micromechanics/microelectronic interfaces
	UNDP*	1982—	Energy conservation and substitution of imported energy inputs in the industrial sector
Bulgaria	IDF	1984-1986	Assistance to the introduction of micro-electronics industry
	UNDP*	1981—	Advanced manufacturing and engineering methods
Chile	UNDP	1984—	Optimización de los sistemas de energía eléctrica
China	UNDP*	1981—	Regional research and development and training centre for mini-hydropower generation
	UNDP*	1985—	Qualification and surveillance laboratory for consumer electronic products
Democratic People's Republic of Korea	UNDP**	1980—	Establishment of a pilot plant and training centre for bipolar digital integrated circuits
	UNDP	1986—	Assistance in testing components used in electrical power distribution system
	UNDP	1986—	Modernization of transformer production—preparatory assistance
Egypt	IDF*	1978-1986	Electronic Industries Research and Development Centre, electric machinery and equipment
	UNDP*	1983—	Energy conservation in industry
El Salvador	IDF	1983—	Desarrollo de la industria electrónica
Ethiopia	UNDP	1985—	Development of mini-hydropower generation plant for rural areas in Ethiopia
Guinea-Bissau	UNDP	1986—	Etude de préfaisabilité pour l'installation d'une minicentrale hydroélectrique en zone rurale
India	IDF	1984-1986	Electronics development
	UNDP*	1981—	Semiconductor devices and electronics subsystems for transportation
	UNDP*	1985—	Establishment of an electronic service and training centre
Iraq	UNDP	1986—	Assistance to improve materials in manganese zinc dry batteries
Mali	IDF	1982-1986	Création d'une unité de production en série de pompes hydrauliques manuelles de type India et Sahelia
Malta	UNDP*	1986—	Maintenance and servicing of electronics equipment
Mexico	UNDP*	1982—	Laboratorios de prueba para la industria eléctrica, apoyo a la fabricación nacional de equipos eléctricos
Pakistan	UNDP*	1982 -	Energy saving in industry
Solomon Islands	UNDP	1985-1986	Development of mini-hydropower programme

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Somalia	UNDP	1986—	Emergency technical co-operation services in electrical power maintenance
Tunisia	UNDP*	1984—	Développement d'une unité de production de moules au sein du Centre technique des industries mécaniques et électriques. Département outillage
Viet Nam	UNDP**	1985—	Technology transfer for the design, testing and pilot manufacture of high-voltage power capacitors for electricity distribution systems
Asia and the Pacific	UNDP*	1980—	Regional research and development and training centre for mini-hydropower generation
	COFN	1984—	Support to the regional network for small hydropower generation, China

For footnotes see table 46.

equipment produced by 11 countries found that only two countries produced the complete range. The Consultation discussed ways to improve this situation, including, *inter alia*, the need to base manufacturing on the requirements of subregional and regional markets.

26. *Transport equipment (ISIC 384)*

Shipbuilding, ship repair
Railroad equipment
Motor vehicles
Motor cycles, bicycles
Other transport equipment

(a) *Present situation*

The transport equipment industry makes an important contribution to total manufacturing output in the North (9.5 per cent in 1985). Its contribution is largest in North America (12.7 per cent) and Western Europe (10.3 per cent), followed by Japan (9.3 per cent) and Eastern Europe and the USSR (5.1 per cent).

In developing countries, the industry's contribution was about 6.1 per cent in 1985. This branch makes a large contribution in Tropical Africa (9.6 per cent). Its contribution is 5.6 per cent in the Indian Subcontinent, 4.9 per cent in South-East Asia, 3.0 per cent in North Africa, 6.8 per cent in Western Asia and 4.8 per cent in Latin America.

Between 1970 and 1985, the industry's output increased faster in developing countries than in developed countries (5.4 versus 3.2 per cent per annum). As a result, the former countries' share of world output in this branch increased between 1970 and 1985 from 5.1 per cent to 6.9 per cent on the basis of a sample of 82 countries, or from 5.7 per cent to 7.5 per cent on the basis of data from 165 countries (see figure XLIV for regional trends).

In many developing countries, the assembly of motor vehicles accounts for a substantial part of the output of this branch of industry. In countries with a large population, motor cycles and bicycles constitute an important part of this industry. In some developing countries (Brazil, Republic of Korea and Singapore) shipbuilding is a major industry, but the majority of countries build only small boats. Aircraft production is carried out in six developing countries: Argentina, Brazil, India, Indonesia, Republic of Korea and Tunisia.

Shipbuilding

The recession in the world shipbuilding industry continued in 1986 but the level of new orders received by shipyards late in 1986 suggests that output could recover in 1987 and 1988. Lower oil prices have stimulated demand for oil and additions to the oil tanker fleet have been ordered. The realignment of currencies and the appreciation of the Japanese yen has made it more difficult for Japan to maintain its very large share (at one time 50 per cent of world output) in this industry. In the early 1980s, the decision was taken to reduce capacity by 30 per cent; in 1986 a decision to reduce capacity by a further 20 per cent was taken [149].

The shipbuilding industry in Western Europe has continued to decline despite a high level of subsidies and generous support by export credits. As there is considerable excess capacity in the world merchant vessel and tanker fleet, emphasis is shifting to specialized ships, naval vessels and offshore drilling platforms for petroleum exploration. The same pattern is found in the United States where construction of merchant ships fell with only eight new ships on order as of January 1986. The activity which was sustained by a large naval construction programme fell by 2 per cent in 1985 and 9 per cent in 1986.

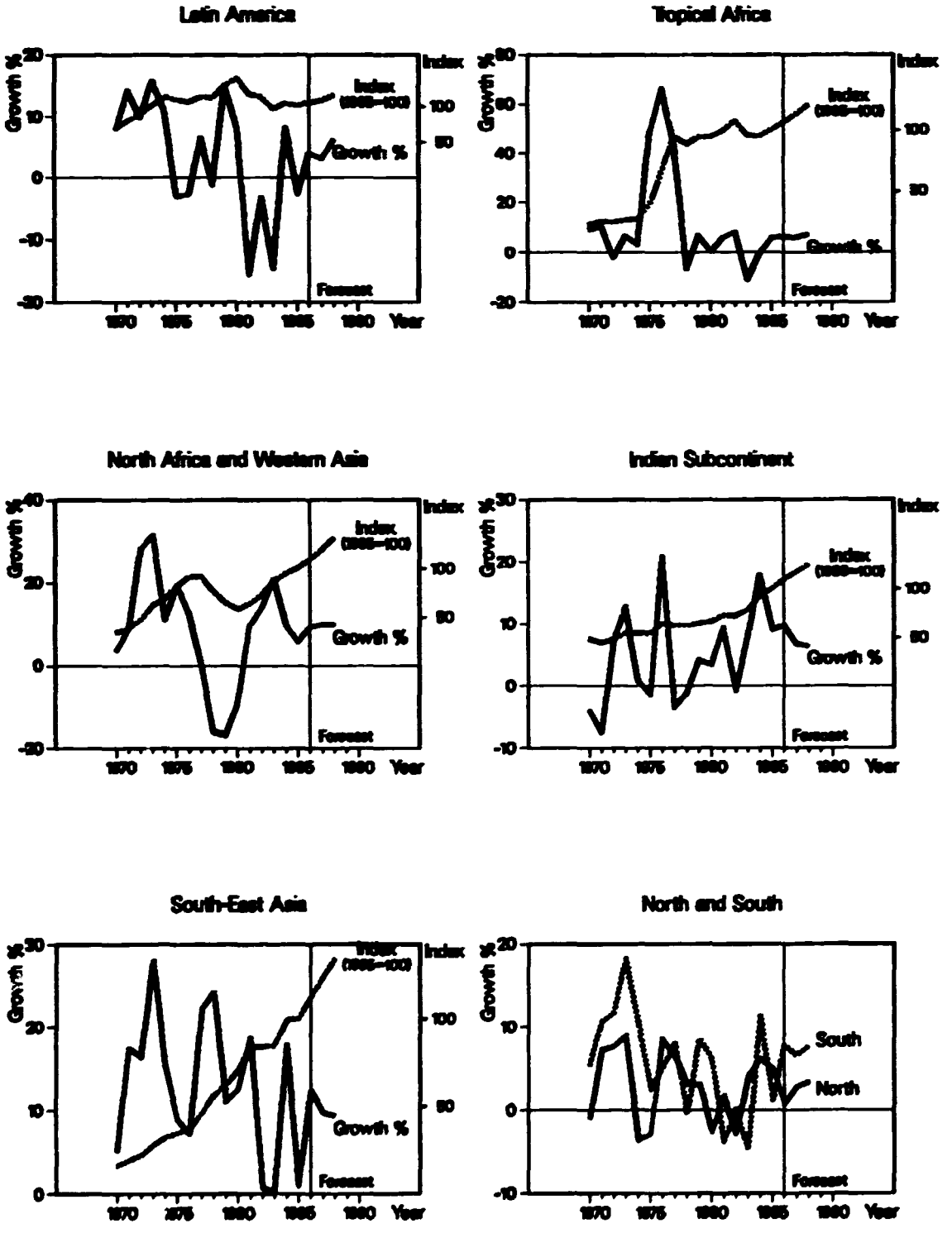
Over a period of 10 years, the Republic of Korea has established a shipbuilding industry that has won 25 per cent of the world's new orders for merchant ships. However, the volume of orders in 1986 was less than expected because of the world recession; as a result, the industry is not expected to expand further [150].

China is the world's third largest shipbuilder. The main task of the five-year development programme for the industry starting in 1986 is to considerably increase China's own merchant fleet to a level around 20 million d.w.t. Exports are encouraged in view of wage rates that are lower than those in the Republic of Korea and Japan, and with the provision of generous credit terms.

Railroad equipment

Although the world market for railroad equipment has been on the decline over the last 10 years, produc-

Figure XLIV. Transport equipment (ISIC 384)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SIVGLO.

tion has been growing in developing countries. India is the largest producer of electric railway locomotives, producing over 200 units a year in the period 1980 to 1984. Diesel locomotives are produced in Brazil, Turkey and the Republic of Korea; in the Republic of Korea output increased sharply in 1983 and again in 1984 to 295 units. The world's largest producers of passenger carriages in 1984 were China and India, each with 1,200 units; other large producers were Algeria, Argentina, Indonesia, Republic of Korea and Turkey. Railway goods wagons and vans are produced in a wide range of developing countries including China (18,000 units), India (almost 15,000 units), Argentina, Brazil, Colombia, Cuba, Ecuador and the Republic of Korea.

Motor vehicles

Motor vehicle sales in the United States exceeded 15.5 million units in 1986. Imports at 3.24 million cars were up 14 per cent despite the agreement that limits car imports from Japan to about 20 per cent of the market. There was no growth in Japan's domestic market in 1986. In Western Europe, car sales jumped from 10.6 million vehicles in 1985 to 11.6 million in 1986. Producers in France, Italy, Federal Republic of Germany and Italy all increased production for their domestic markets (see table 97).

The largest integrated producers of passenger cars among developing countries and areas in 1984 were Brazil (666,000), Mexico (244,000), Republic of Korea (167,000), Argentina (143,000) and India (64,000). The largest assemblers of passenger cars from imported parts and components in 1984 were Taiwan Province of China (100,000), Malaysia (94,000), Venezuela (87,000), Turkey (55,000), Thailand (36,000), Colombia (36,000), and Egypt (25,000). Since 1984, demand for cars has been weak in Latin America and the main plans for expansion of this industry have been in Asia.

Brazil's production of motor vehicles increased 9 per cent in 1986 to 1 million units and could have been 10 per cent higher but for strikes and a shortage of supplies. Output is expected to increase sharply in 1987, with exports rising from 180,000 to 300,000 vehicles and earnings of $2.2 billion, with further increases of 10 per cent in 1988 and 1989. In a new agreement with the Government, motor vehicles manufacturers have committed themselves to investments of $1 billion, car exports of $7.2 billion and a minimum trade surplus for the car, truck and tractor industry of $4.5 billion. In return, the Government has agreed to flexible pricing in the domestic market and a gradual reduction in taxes on the sale of motor vehicles [151].

The Republic of Korea has become a major exporter of passenger cars. Hyundai Motors, with a capacity to produce 600,000 cars, successfully exported 80,000 cars to Canada in 1985 and 165,000 to the United States in 1986; in 1987 it expects to produce 450,000 cars and export 300,000. Daewoo, the second Republic of Korea producer, expects to produce 140,000 cars in 1987 and export 80,000. The third company, Kia, which was banned from car production between 1981 and 1985 while the other two producers became established, expects to produce 115,000 cars in 1987 and export 85,000 ([152], [153]).

In India, controls over the expansion of the motor vehicle industry were lifted in 1985 and there was a rush of new foreign collaboration proposals. In 1986, some of these proposals were dropped, but others will be implemented by 1990.

In Taiwan Province, producers rely on assembling vehicle kits imported from Japan or Western Europe. The market of 150,000 motor vehicles in 1985, including 100,000 passenger cars, is expected to double by 1993 and four Japanese producers have linked up with local assemblers. Some small cars and light commercial vehicles are already assembled for export, but plans made in 1984 by one Japanese producer to establish an export-oriented passenger car plant have been cancelled. The automobile parts and components industry has become very competitive; exports increased 65 per cent to $500 million in 1985 and continue to grow.

Reserving the home market for one integrated car producer rather than several competing producers is a precondition for, if not a guarantee of, success, as Malaysia has found. Its plant capacity of 120,000 cars seemed reasonable in 1983 when the market was 90,000 cars. By 1986, demand had fallen to 45,000 cars and the company sold only 22,000 units. Malaysia is therefore looking to export markets to boost production. As the cost of Japanese parts and components have risen with the yen, more local sourcing and other alternative suppliers are being considered.

A much wider range of developing countries report production or assembly of buses and trucks. Indonesia,

Table 97. Leading producers of passenger cars, 1985 and 1986

Country	Production for domestic market (thousands of units)		Imports in thousands of units		Percentage share of imports
	1985	1986	1985	1986	1986
France	1 120	1 216	646	696	36.4
Germany, Federal Republic of	1 650	1 911	728	918	32.4
Italy	1 047	1 124	700	703	38.5
Japan	3 054	3 077	50	68	2.2
United Kingdom	768	824	1 064	1 054	56.0
United States	8 204	8 214	2 837	3 238	28.3

Source: Financial Times, 23 January 1987.

Republic of Korea, India and Turkey were the largest producers of buses and motor coaches in 1984. The Islamic Republic of Iran, Thailand, Malaysia and Turkey were the largest producers of trucks that reported output (see table 98). Local assembly of buses and trucks is an important first step in starting motor vehicle production; it needs to be followed by the progressive local manufacture of parts and components.

Table 98. Buses and trucks produced or assembled in various developing countries, 1984

(Number of units)

Country	Buses and motor coaches		Trucks assembled
	Assembled	Produced	
Algeria	731	—	7 344
Burma	97[a]	—	736[a]
Brazil	—	1 214	...
Chile	—	—	2 559
Colombia	1 853[b]	—	11 448
Cuba	2 219	—	500
Egypt	788[a]	—	2 736
India	—	17 699	...
Indonesia	100 215	—	570
Iraq	...	—	3 115[c]
Iran (Islamic Republic of)	—	9 526	77 678[a]
Malaysia	688[a]	—	26 780
Mexico	—	5 413	...
Morocco	...	—	940
Nigeria	...	—	11 363[a]
Pakistan	614	—	14 650
Peru	...	—	2 671
Philippines	...	—	3 864[a]
Republic of Korea	—	24 825	...
Thailand	...	—	74 910[d]
Trinidad and Tobago	...	—	3 656
Tunisia	146	—	9 798
Turkey	12 125	—	23 217
Zaire	...	—	1 484[a]

Source: United Nations [62].

Note: Some countries may include light commercial vans in the reported output of trucks.

[a] Indicates 1983 output.

[b] Indicates 1976 output.

[c] Indicates 1982 output.

[d] Includes output of buses.

Motor cycles and scooters

World output of motor cycles and scooters reached 10.3 million in 1985. Developing countries' output increased and Japan's output, which was 7.4 million in 1981, fell to 4 million units. China, India and Thailand, with annual production of 400,000 units, are the largest producers among developing countries.

Bicycles

World production of bicycles increased from 60 million units in 1980 to 74 million units in 1984. In the latter year, Chinese production (28.6 million) was the largest, followed by Japan (6.8 million) and India and the United States (5.9 million each). Other large producers were Brazil (2 million), Republic of Korea (0.8 million) and Pakistan (0.45 million).

Aircraft

After a recession in 1984, world demand for large transport aircraft picked up in 1985 and 1986; further growth is expected in 1987. Between 1980 and 1985, aircraft of the two main United States producers (Boeing and McDonnell Douglas) captured 78 per cent of the world market for large civilian transport aircraft; Airbus Industries (the Western European consortium) 17 per cent and British Aerospace and Fokker (Netherlands) 5 per cent. More than 50 per cent of United States output of large commercial aircraft was purchased by foreign airlines in 1986. For the United States aircraft industry, exports were worth $20 billion in 1986 compared with imports of $8 billion. Half of total exports were aircraft engines and parts worth $10 billion in 1986.

The world market for small aircraft with 20-70 seats used for commuter traffic, business transport and recreation is more competitive. Canada, France, Italy, Sweden, the United Kingdom and the Netherlands all produce small aircraft, as do Argentina, Brazil, Indonesia and India among the developing countries. In 1986, Argentina and Brazil agreed to co-operate on aircraft production. The world fleet of helicopters is estimated at 16,500, with 10,000 in the United States. Demand has fallen sharply in the United States and the rest of the world in recent years.

(b) *Future prospects*

The developing countries' output of transport equipment is expected to increase by 6.5 per cent in 1987 and by 7.5 per cent in 1988. Developed countries' output is expected to increase by 3.2 per cent in 1987 and 3.8 per cent in 1988.

Among developing regions, rapid growth is expected in South-East Asia (9.8 per cent in 1987 and 9.4 per cent in 1988) and in the Indian Subcontinent (6.8 per cent in 1987 and 6.3 per cent in 1988); in both regions motor vehicle output will increase sharply. In Western Asia, the output of this industry has grown rapidly since 1980 and further rapid growth is forecast at 10.4 per cent in both 1987 and 1988. In Latin America, output of this industry fell 30 per cent between 1980 and 1983; the recovery in the period 1984-1986 has been weak and a further period of moderate growth is forecast (3.0 per cent in 1987 and 6.1 per cent in 1988). In Tropical Africa, output began to recover in 1985 and further growth is forecast (6.4 per cent in 1987 and 6.9 per cent in 1988). In North Africa, growth of 5.3 per cent in 1987 and 5.6 per cent in 1988 is forecast. Imports from the North totalled $50 billion in 1985 compared to the South's production of about $60 billion in this industry. There is, therefore, considerable scope for further import replacement of imports by local production. Motor vehicles are likely to become the most widely used form of transport. Trucks and buses may continue to be required in almost as large a volume as private passenger cars in some developing countries; but in the long-term, car ownership will expand.

In developed countries, car ownership had reached the point in 1980 where there was one car for every two persons in the United States, one for every three persons in the EEC and one for every five persons in Japan. Brazil, with the largest car industry among developing countries, had one car for every 16 persons in 1980; Nigeria had one car per 150 persons, Indonesia one car per 250 persons and India one car per 750 persons. In the Republic of Korea, where a worker in a car production plant earns $3.50 an hour (compared to $14 in Japan), the purchase of a car requires up to 12 months' earnings; in other developing countries a car purchase may require several years' earnings. Hence, the new designs of low-cost, simple, but robust, cars in Argentina, India and the Republic of Korea are likely to expand their share in the years to come.

The outlook for shipbuilding must be considered in two parts. Developing countries are still building up their own merchant fleets. Hence, despite world excess capacity, some new merchant vessels may continue to be produced. But a brighter future lies in the production of small boats, in particular in countries that have recognized a potential to develop the fishing industry.

The outlook for railroad equipment varies from country to country. Some countries, such as Malaysia and Thailand, plan to modernize their railways and rolling stock. The most urgent need is to start production of vans and wagons in Tropical Africa. The potential of inter- and intra-regional trade among developing countries has not yet been fully exploited.

The industry producing large aircraft is likely to remain concentrated in the North, but trade among developing countries in small aircraft is likely to continue to grow.

(c) *UNIDO activities*

The production of most types of transport equipment requires large-scale and sophisticated production facilities. UNIDO advice has been requested in certain specialized technical aspects of the industry (see table 99).

The design, development and manufacture of railway wagons and coaches was discussed at a seminar at New Delhi in November 1986, with participants from a group of developing countries. For the motor vehicle industry, UNIDO has advised Hong Kong and India on emission problems and assisted Romania to improve the manufacturing technology of piston rings in internal combustion engines. The building of small boats has been the subject of assistance to countries like the Seychelles.

UNIDO's Investment Promotion Service has promoted foreign collaboration in the manufacture of bicycle reflectors and river passenger boats in China. A $4.4 million investment in a truck repair workshop in Jordan was promoted in 1985. A large investment, $22 million, for the production of automobile engines, was promoted in Indonesia. Bicycle production in Rwanda was also promoted.

Table 99. Selected UNIDO technical co-operation projects related to the transport equipment industry

Region, country or area	*Source of funds*[a]	*Executing period*[b]	*Project title*[c]
Bhutan	UNDP*	1983—	Strengthening the maintenance and overhauling department of the Bhutan Government Transport Service
Bulgaria	IDF	1984—	Improvement of the quality of the screw propeller models
Burkina Faso	RP*	1986—	Renforcement des capacités d'entretien et de réparation pour le parc de tracteurs agricoles et autres équipements mobiles et lourds
China	COFN*	1985—	Upgrading of economy and reliability of the locomotive diesel engine
	UNDP*	1985—	Locomotive test stand
	UNDP	1985—	Centre for the technical development of dimensional measuring instruments and machines
Hong Kong	UNDP	1982—	Improvement of emissions from motor vehicles
India	UNDP**	1979—	Bicycle research and development centre
	UNDP**	1983—	Fatigue laboratory for automotive industry
Pakistan	UNDP**	1983—	Assistance to Pakistan Automobile Corporation—manufacturing engineering assistance to vendors
Romania	UNDP	1984—	Improvement of piston ring manufacturing technology for internal combustion engines through flame-sprayed molybdenum
Seychelles	IDF	1980—	Establishment and operation of a boatyard and boat maintenance complex
Yugoslavia	UNDP	1985—	Assistance to the industry of engine parts
Africa	RP	1985—	Expert meeting on small-scale boatbuilding and boat repair for East African countries, Port Louis, Mauritius, 9-14 December 1985
Latin America	IDF	1986—	Preparatory assistance in transfer of modern technology in hydro-dynamic investigations for shipbuilding
Interregional	IDF	1984—	Interregional seminar on railway rolling stock (wagon and coach): design, development and manufacture, New Delhi, 5-13 November 1986
	UNDP	1986—	In-Plant Group Training Programme in the field of repair and maintenance of small/medium ships, Antwerp, 8 October 1986-23 January 1987

For footnotes see table 46.

27. *Professional and scientific equipment (ISIC 385)**

Medical and dental equipment
Radar and X-ray equipment
Instruments for measurement and control
Photographic, optical goods
Watches, clocks

(a) *Present situation*

This industry's contribution to total manufacturing output is much larger in developed (2.3 per cent) than in developing countries (0.6 per cent). Between 1970 and 1985, its output increased twice as fast in the latter than in the former countries (8.2 versus 4.2 per cent per annum). As a result, the developing countries' share of world output in this industry rose between 1970 and 1985 from 2.1 per cent to 3.5 per cent on the basis of a sample of 82 countries, or from 2.3 per cent to 3.9 per cent on the basis of data from 165 countries (see figure XLV for regional trends).

At present, eight developing countries and areas—Argentina, Brazil, Mexico, India, Pakistan, Republic of Korea and Taiwan Province—account for more than 80 per cent of the output of this industry in the South. Argentina, Brazil, Mexico, India and Pakistan produce a fairly wide range of products for the domestic market. A major part of the output of Hong Kong, Taiwan Province and the Republic of Korea is exported.

The other developing countries rely almost entirely on imports which totalled $9 billion in 1985, compared to an estimated level of production in developing countries of $5.5 billion. About 50 per cent of the imports consist of measuring instruments of all types and 25 per cent consist of watches and clocks (see table 100).

Measuring instruments, mostly for the electronics industry, account for a major part of this industry's output. Japan's Electrical Measuring Instruments Association sees a bright future with output expected to increase by 10 per cent per annum and reach 1,000 billion yen by 1989. The fastest expansion (14 per cent per annum) is expected in electric and electronic test and measuring equipment, which will account for 60 per cent of ouput. Output of instruments for process measuring and control are expected to grow at 6.5 per cent per annum and account for 30 per cent of output. The other 10 per cent of output will include radioactive measuring instruments, electric meters and measuring equipment for environmental control.

World production of watches increased by 16 per cent to 530 million pieces in 1986. Production of digital watches increased by 31 per cent to 195 million pieces. Production of analog watches increased by 16 per cent to 200 million pieces, and the production of traditional mechanical watches fell slightly, to 135 million pieces.

Japan remains the world's largest watch producer, with production in 1986 up 7 per cent at 190 million pieces. In 1986 Hong Kong's output increased by 40 per cent to 140 million pieces, and its makers of cheap digital watches started subcontracting assembly work in China. Switzerland's watch production rose 7 per cent to 64 million pieces in 1986; it was boosted by a further increase of low-priced analog watches such as "Swatch" [154].

Table 100. Professional and scientific equipment imported by developing countries, 1980, 1982 and 1985

(Billions of dollars)

Equipment	*1980*	*1982*	*1985*
Medical instruments	0.64	0.74	0.73
Measuring instruments	3.46	3.97	4.63
Meters and counters	0.21	0.18	0.14
Photography and apparatus	0.75	0.65	0.80
Optical instruments	0.22	0.27	0.40
Watches and clocks	2.70	2.20	2.25
Total	7.97	8.00	9.04

Source: UNCTAD/UNIDO: Trade statistics data base.

(b) *Future prospects*

The output of professional and scientific equipment in developing countries is expected to increase by 7.4 per cent in 1987 and 8.3 per cent in 1988. In developed countries, output is expected to increase by 4.8 per cent in 1987 and 5.2 per cent in 1988.

Among developing regions, rapid ouput growth is expected in East Asia (8.3 per cent in 1987 and 8.7 per cent in 1988), where exports play an important role, and in the Indian Subcontinent (6.7 per cent in 1987 and 8.7 per cent in 1988). In Latin America, after a slow-down in 1986, faster ouput growth is forecast (6.1 per cent in 1987 and 8.0 per cent in 1988). Tropical Africa has very little output in this industry and no growth is forecast in 1987 and 1988. Moderate growth is forecast for North Africa (2.1 per cent in 1987 and 3.7 per cent in 1988). Western Asia's output trebled between 1975 and 1985 from a low base and further rapid growth is expected (9.2 per cent in 1987 and 9.3 per cent in 1988).

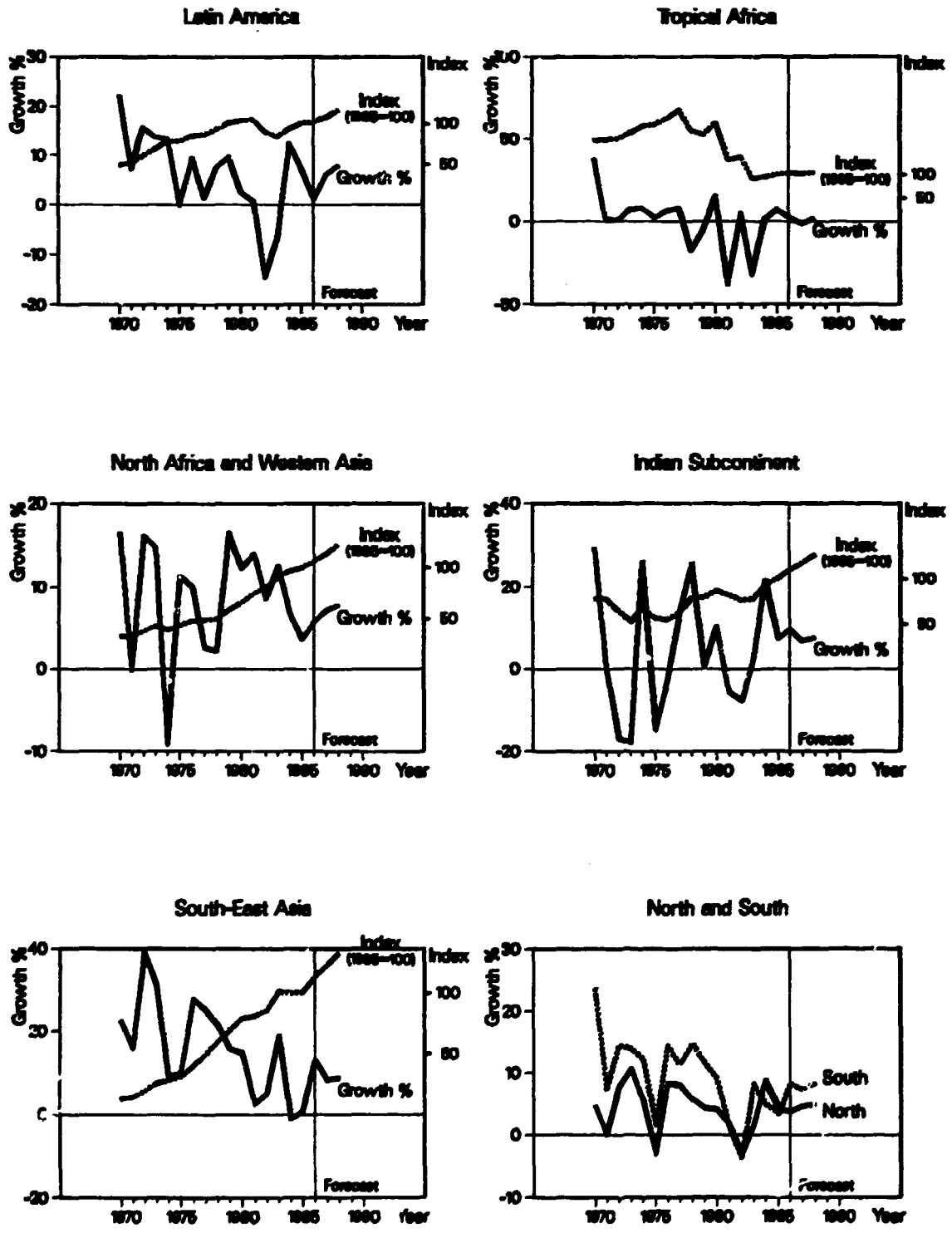
East Asia accounts for more than 55 per cent of the South's production and is expected to remain the major producing region. Rapid growth will be achieved through a further expansion of exports rather than import substitution in Hong Kong, Republic of Korea, Singapore and Taiwan Province. In the other ASEAN countries there is considerable scope for local production to replace imports. On the Indian Subcontinent, both increased exports and increased production to replace imports are in prospect.

Latin America, which accounts for 30 per cent of the South's output, has already substituted local production for imports on a substantial scale, but increased intra-regional trade should spur further growth in the future. The agreement by Argentina and Brazil to promote trade in capital goods by eliminating tariffs on bilateral trade will be an important stimulus for the engineering industries in these countries.

The professional and scientific equipment industry is a high-technology industry. At the same time it is one which is essential for producers of engineering goods. In many cases, it is the lack of a local capability to produce the measuring and control instrumenta-

*UNIDO acknowledges a contribution made by Citizen Trading Company, Ltd., Tokyo.

Figure XLV. Professional and scientific equipment (ISIC 385)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SR/GLO.

Table 101. Selected UNIDO technical co-operation projects related to the professional and scientific equipment industry

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Bulgaria	UNDP*	1982—	Automated Production Instrumentation Centre
	IDF	1983—	Modular design concept for the new generation of scientific instruments
	UNDP	1984—	Assistance in design, development and implementation of measuring devices for machine-tools motions and positions measurements
Chile	UNDP	1985—	Establishment of model centre of repair and maintenance of biomedical and electronic equipment
China	UNDP*	1981—	Assistance in the establishment of a photocopier research and development centre
	UNDP*	1981—	Assistance to the service centre of testing technology
	UNDP	1980—	Assistance to the General Machinery Bureau—electrostatic precipitator testing and development
Cyprus	UNDP	1985—	Advisory assistance to biomedical equipment repair and maintenance service
India	UNDP*	1981—	Development of NMR (nuclear magnetic resonance) spectrometers for oil-seed characterization
	UNDP**	1982—	Evaluation and product-cum-process development centre at the Institute for Design of Electrical Measuring Instruments
	UNDP**	1982—	Improvement of testing and evaluation facilities, National Test House
	UNDP*	1984—	Development of micro-precision engineering techniques, HMT Ltd.
	UNDP*	1985—	Systems and applications in fibre-optics technology
Romania	IDF	1984—	Ceramics utilization in engine and turbine industry
Sao Tome and Principe	RP	1985—	Assistance in the field of maintenance of industrial equipment
Viet Nam	UNDP**	1980—	Electronic and optical maintenance and repair centre
	UNDP	1980—	Calibration and quality control centre for electronic production
Interregional	IDF	1984—	Interregional workshop on precision engineering techniques and horology, Bangalore, India, February 1986

For footnotes see table 46.

tion incorporated in machines that prevents further advances in the local production of capital goods. The solution to this obstacle requires more frequent unpackaging of technology in transfers of technology and much greater domestic capabilities in the field of instrumentation.

(c) *UNIDO activities*

UNIDO technical co-operation is rarely provided to commercial production lines of professional and scientific equipment, but is usually directed to the public technical development and repair and maintenance activities of instrumentation centres. This was the case for example in Viet Nam (see table 101). Three countries have been assisted in the field of instrumentation and process control equipment: Albania and Bulgaria in projects with broad overall objectives, and India with two types of instruments required by the dairy and oil-seed processing industries.

28. Other manufacturing industries (ISIC 390)

Jewellery, toys, sporting goods, musical instruments, etc.

(a) *Present situation*

This is a small industrial branch contributing 1.7 per cent of the total manufacturing output of both developing and developed regions. In the former regions, the contribution is highest (2.5 per cent) in East and South-East Asia, where substantial exports have been developed, especially in Hong Kong and Pakistan.

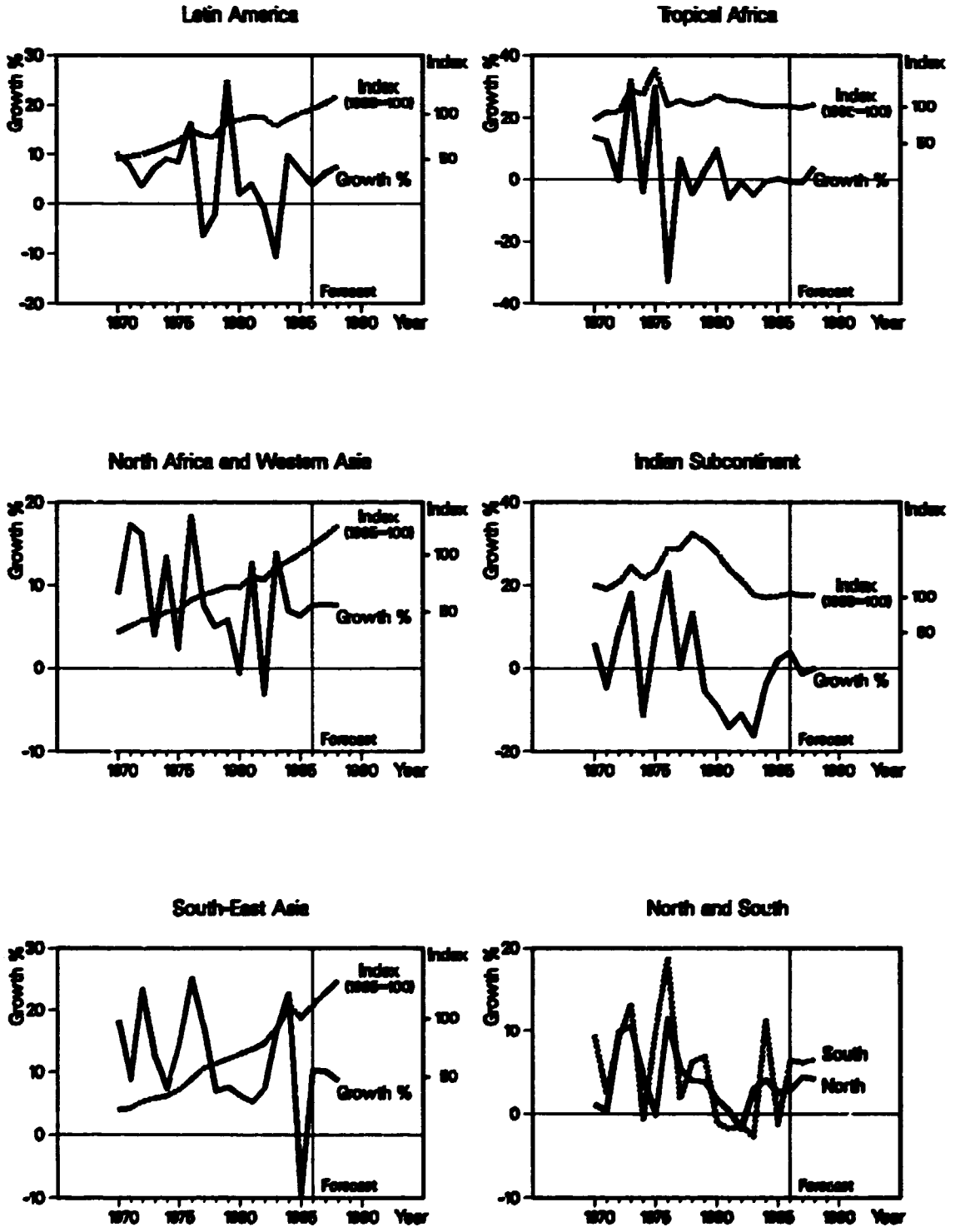
Between 1970 and 1985, the output of this branch increased by 4.5 per cent per annum in developing countries and by 4.0 per cent per annum in developed countries. As a result, the former countries' share of world output in that period increased from 10.8 to 11.6 per cent on the basis of a sample of 82 countries, or from 12.2 to 12.9 per cent on the basis of data for 165 countries (see figure XLVI for regional trends).

The products of the branch consist mostly of luxury or leisure-time goods such as jewellery, toys and musical instruments. These are consumed in growing volume in developed countries where personal incomes are high.* Developing countries' share of world output in this category in 1985 was 11.6 per cent, the same as in 1975.

Jewellery production in developing countries and areas is mostly for the domestic markets. There are two basic types of jewellery traded internationally —jewellery made from precious metals, where developed countries are the major suppliers, and costume jewellery, where developing countries have become

*The value of domestic sales of dolls, games and toys in the United States in 1985 was $7.2 billion, equivalent to a *per capita* expenditure of $143 for each person below the age of 15, a level close to the *per capita* income of the population of some of the poorest least-developed countries. The calculations were based on statistics provided in [70].

Figure XLVI. Other manufacturing industries (ISIC 390)



Source: United Nations Industrial Statistics, estimates and forecasts by UNIDO/SPR/GLO.

major exporters. In 1986, for example, imports of costume jewellery to the United States worth $570 million, or 30 per cent of the United States market, came from Hong Kong, Japan, Republic of Korea and Taiwan Province. In 1984 Hong Kong's exports to all destinations were worth $343 million (including $203 million in precious-metal jewellery). In the same years, Singapore's exports were worth $74 million.

The production of dolls, games and toys is labour-intensive and some developing countries and areas have demonstrated their comparative advantage by successfully entering the export markets. For example, imports of dolls, games and toys worth $2.7 billion accounted for 37 per cent of the total consumption of these items in the United States in 1985. A major part of these products were imported from Hong Kong, the Republic of Korea and Taiwan Province. Their international competitiveness has been confirmed by the United States toy industry's petition to exclude a number of these imports from the General System of Preferences after 1 July 1987.

Western Europe also imports dolls, games and toys from these three sources. Hong Kong's total exports of toys and games to all destinations were valued at $1,331 million in 1981 and $1,673 million in 1984. The Republic of Korea's exports were worth $366 million in 1981 and $483 million in 1984. Singapore's exports were valued at $113 million in 1984.

Developing countries and areas have also become successful exporters of musical instruments. In 1985, their exports of these instruments won a 40 per cent share of the United States market. Although Japan remained the largest supplier, some United States manufacturers began to import instrument parts from the Republic of Korea and Taiwan Province. In 1985, the Republic of Korea supplied one third of United States imports of pianos and Japan one half. Exports of musical instruments from the Republic of Korea to all destinations doubled between 1981 and 1984 to reach $242 million in 1984. Hong Kong's exports increased from $133 million in 1981 to $200 million in 1984. Singapore's exports increased from $87 million in 1981 to $125 million in 1984.

(b) *Future prospects*

The output of this branch in developing countries is expected to increase by 6.0 per cent in 1987 and 6.5 per cent in 1988. In developed countries, it is expected to increase by 4.5 per cent in 1987 and 4.4 per cent in 1988.

Among developing regions, the fastest growth is forecast for East and South-East Asia (10.0 per cent in 1987 and 8.8 per cent in 1988). Rapid growth is also forecast in Latin America (6.0 per cent in 1987 and 7.4 per cent in 1988), Western Asia (7.6 per cent in both 1987 and 1988) and North Africa (7.4 per cent in 1987 and 7.2 per cent in 1988). For Tropical Africa, the forecast is for a small fall in output in 1987 followed by a 3.7 per cent increase in 1988. For the Indian Subcontinent, where statistics suggest that output has been subject to wide swings over the years, a small decline in output is forecast.*

The long-term outlook for this industry is for continued rapid growth in East and South Asia. In other regions, growth will reflect trends in the demands of the population at the upper income levels. Future growth should at least match the pace of growth of the manufacturing sector as a whole.

(c) *UNIDO activities*

A project in Botswana illustrates UNIDO's role. When a UNIDO expert arrived in 1986, the Thusano Workers' Co-operative, a small-scale industry sponsored by the Botswana Enterprise Development Corporation, had been manufacturing low-priced jewellery of brass and horn. Six months later, by switching to silver, improving designs and reorganizing production methods, the co-operative increased its output four-fold. When the UNIDO expert left, the co-operative was turned over to the management of a local jeweller in the private sector. The Botswana Enterprise Development Corporation set up a workshop to cut local agate and agate-related stones at a new factory in Francistown. The UNIDO expert planned the layout of the factory and supervised the equipment acquisition from the Swedish International Development Authority.

In addition to table 102, table 103 has been included to list UNIDO technical co-operation projects covering miscellaneous activities not specific to one branch of industry, such as packaging, pollution control, composting municipal waste, use of biogas etc.

*Statistics for this industry could include production of other industries incorrectly allocated to this miscellaneous group of industries.

Table 102. Selected UNIDO technical co-operation projects related to other manufacturing industries

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Botswana	UNDP	1985—	Management assistance to Thusano Workers Co-operative Society Ltd.
Dominica	IDF	1983—	Assistance in upgrading the productivity of tourist and export-oriented small craft industries
Ethiopia	RP	1986—	Assistance in the establishment of a pilot gem-stone processing unit
India	UNDP*	1984—	Process-cum-product development centre for sports goods

For footnotes see table 46.

Table 103. Selected UNIDO technical co-operation projects (unclassified)

Region, country or area	Source of funds[a]	Executing period[b]	Project title[c]
Algeria	UNDP	1986—	Développement des capacités de l'Entreprise nationale d'organisation et d'information en matière de consulting industriel
Bahrain	UNDP	1985—	Assistance in composting municipal wastes
Barbados	UNDP	1986—	Control of fly ash from sugar industry
Brazil	UNDP*	1982—	Enzymatic hydrolysis of cellulosic materials and production of other liquid fuels from biomass
Burkina Faso	IDF	1978—	Demonstration of biogas technology
	IDF*	1981—	Industrial biogas technology demonstration plant and experimental station
	IDF	1983—	Pilot plant for compost production from municipal solid wastes
	UNDP	1985—	Technology development of water treatment for industrial use
Cuba	UNDP*	1981—	Asistencia al Centro Nacional de Envases y Embalajes
	UNDP	1985—	Diseño industrial
Ecuador	UNDP	1986—	Expansion of a compost plant
Ethiopia	IDF	1982—	Biofuels demonstration programme, preparatory assistance
Guinea-Bissau	UNDP	1982—	Survey of packaging demands and constraints and elaboration of a national package consumption and production policy
India	UNDP**	1982—	Strengthening of industrial design services at the National Institute of Design
	UNDP**	1983—	Pollution Control Research Institute, Hardwar, Uttar Pradesh
	IDF	1986—	Fluid catalytic cracking: catalyst evaluation and technology
Jamaica	UNDP*	1982—	Consolidation of the packaging centre and establishment of a plastics centre at the Jamaica Bureau of Standards
Mexico	UNDP	1986—	Asistencia a CLEMEX en diseño de productos
Mongolia	UNDPTF*	1982—	Strengthening the technological base of the Mongolian People's Republic State Committee for Science and Technology for designing, production and testing of prototypes based on scientific research
Nicaragua	UNDP	1985—	Packaging studies for the industrial sector
Paraguay	UNDP	1983—	Desarrollo de tecnologias para el uso energético de la biomasa
Philippines	UNDP	1978—	Assistance to energy production from biomass waste materials
Qatar	UNDP*	1983—	Industrial pollution
Romania	UNDP	1985—	Establishment of a pilot air pollution monitoring warning network in an industrialized urban area
Sri Lanka	OTF	1986—	Ceramic research laboratory
Syrian Arab Republic	UNDP	1984—	Assistance in the expansion of production of alkyd resin and polyvinyl acetate
Thailand	UNDP	1984—	Advisory services for environmental pollution control for Eastern seaboard
Turkey	UNDP*	1981—	Assistance to the packaging centre
Uruguay	UNDP	1983—	Alternative sources of energy
Viet Nam	UNDP	1984—	Institute for tropical technology and environmental protection
Arab countries	UNDP*	1983—	Establishment of the Arab Regional Packaging Centre
	COFN	1984—	Regional consultancy services and training—interregional co-operation between Latin American countries in advanced research and technology for packaging
Asia and the Pacific	UNDP	1983—	Technology transfer in organo-industrial pollution monitoring
	IDF	1984—	Transfer of Chinese biogas technology to countries in Asia and the Pacific region
Global	IDF	1985—	UNIDO participation in World Congress on Non-metallic Minerals, Belgrade, 15-19 April 1985, and subsequent technical workshop, Pilsen, Czechoslovakia, 21-28 April 1985
Interregional	IDF	1985—	Consultative committee for biomethanation of agro-industrial residues for energy recovery and nutrient recycling, Belgium 17-21 November 1986

For footnotes see table 46.

V. Conclusions: the problems of global industrialization—how can UNIDO help?

A. Recapitulation

The foregoing chapters clearly demonstrate the continuing stagnation of the world industrial economy. Many complex and conflicting economic forces have brought this about. The impact of the series of external shocks on the manufacturing sector of developing economies has been severe, and developed countries have not emerged unscathed from the experience.

The forecasts presented in this *Global Report* generally reflect our confidence, despite recurrent doubts, in the speed at which modern industrial society has responded and adjusted to the shocks of the past decades. The forecasts thus focus on the more positive side of the conceivable alternatives. They should be taken with due caution, since the economic situation could further worsen in some parts of the world unless adjustment efforts are vigorously pursued.

Since 1980, there has been both stagnation and structural change in the world industrial economy. On the one hand, developing countries that enjoyed economic progress during the 1970s are now beset with problems of falling primary commodity prices, a rising burden of debt servicing, net capital outflows, protectionist barriers against entry into the markets of developed countries and the urgent demand to meet the rising needs of their people. On the other hand, developed countries that suffered a recession during 1980-1982 have experienced an uneven recovery, increasingly characterized by low levels of growth, and face continuing problems of industrial restructuring while financial forces dominate and distort the real economy.

As may be seen from the fairly detailed assessment of the situation in different regions presented in chapter II of this *Global Report*, the global picture is no more uniform than it has been in the past. The outlook presented in statistical terms for the developing world as a whole in the coming years owes much to the impressive performances of certain developing countries that have already built up a relatively well-trained and skilled work-force and are in a position to benefit from the new "globalization" trends in industrial production. Thus, nearly one quarter of the United States trade deficit of $170 billion in 1986 was with selected developing countries of East Asia and a few Latin American countries. ASEAN members and the countries of the Indian Subcontinent have not fared as well as their East Asian neighbours, but their efforts to achieve structural reform to counteract industrial stagnation may trigger a more or less steady drive for greater efficiency and diversification of their industries and help to forge greater technological, financial and trade linkages with the world industrial economy.

Western Asia and North Africa have, on the whole, maintained a steady pace of industrial growth, despite their increasing resort to deficit financing, and despite the growing trade barriers in the EEC and other external markets against the output of their joint ventures in petroleum-based downstream products. In Latin American countries, much of the driving force may have to come from domestic demand, given those countries' huge external debt and the slow growth foreseen in the North. Further innovative policies need to be pursued at both national and international levels for the revival of productive investment, as well as for intra-regional industrial co-operation.

Countries in sub-Saharan Africa, still mostly in the early stages of industrialization, have proven extremely vulnerable to changing external constraints, and urgently need to rehabilitate or replace parts of their installed production capacities. The economic recovery programme for Africa should not involve fiscal austerity measures that play havoc with financially vulnerable import substitution industries, but should be based on a well-structured strategy for strengthening the local industrial base and a renewed effort towards regional or subregional industrial co-operation.

Deepened "interdependence", although it is an outcome of the unprecedented levels of world economic growth during the 1950s and the 1960s under the Bretton Woods system, has increasingly eroded that system, making the process of intergovernmental co-operation ever more strained. The impact of this global process has varied widely in different parts of the world. Recognizing the cultural and economic diversity of the members of the international community, UNIDO has thus adopted a strategy of "sharper country focus". In *Global Report 1987*, country-to-country variations in the industrialization effort are taken more fully into account than in earlier *Global Reports*. It is hoped that taking stock of such variations can contribute to 'mutual identification" among members of the global community—a prerequisite for working out any new rules for accommodating those members' varied needs and promoting concerted action on a global scale.

The emerging challenges are far-reaching. The external debt crisis and stagnating flows of new investment to developing countries require further initiatives by the international community to recycle the excess savings of certain parts of the world into economic recovery programmes for indebted developing countries. The current state of international economic relations, overshadowed by threats of "trade wars" and worsening terms of trade for primary commodity exporters, has made increasingly difficult a straightforward pursuit of the once-popular outward-looking industrialization strategy of developing countries. The paradoxical effects of the move towards "deregulation" has made industries in developed countries more "footloose", and led to increased involvement of some dynamic developing countries in the global production network. At the same time, when combined with austerity measures designed to bring about short-term adjustments, policies of deregulation can erode the commitment to long-term industrial development in indebted developing countries. Moreover, the dramatic shift in the frontiers of technology in developed countries is creating new challenges and ever growing adjustment pressures on industrial structures in developing countries. These new constraints and the uncertainty generated by them are not merely cyclical, but structural, in nature. Deeper interdependence has implied an increased degree of sensitivity of one country's economy to the changes emerging in other economies. The international bargaining process has now become obstinately tied to domestic interests.

One can nevertheless discern signs of an increasing convergence in the perception of the changing character of international economic relations, a convergence that might help to improve future policy designs for structural adjustment within and between countries. At the level of real economic considerations, the recent United States and Japanese initiatives on the issues of external debt and structural adjustment seem to stem from recognition of the need to resume growth for adjustment and to avoid the political destabilization that may result from further prolonged deflation in debtor countries. It is a recognition that a long-term solution of the debt problem must be based on the growth of output and exports in the debtor countries, with all the dangers that such a strategy might present to the solvency of international banking. This "real" objective collides with the "financial" objective at the operational level, which tends to be limited to "defensive lending" on the part of creditors interested only in protecting the value of their existing claims. The gap between these two objectives is aggravated partly by the well-known "free rider" problem, which in turn stems from the situation where each single creditor could be better off if many others pursued defensive lending more vigorously. Clearly therefore, there is scope for the IMF, the World Bank and other official co-operation agencies to seek to coerce the banks into collective lending in their own interest. Greater official lending can certainly enhance the ability of those official bodies to play the crucial mediating role.

The discussion in chapter III amply demonstrates how the contractionary forces of adjustment policies, and particularly drastic reductions in the import capacity of debtor countries, have undermined the very capacity of these countries to outgrow their growing debt. In the context of "adjustment with growth", measures addressed to the productivity-raising aspects of industrial restructuring should receive much greater attention. Potentials of industrial rehabilitation at sub-sectoral levels need to be looked into more intensively in the design of structural adjustment lending programmes, and more effective ways of integrating these programmes with technical co-operation activities should be established. Also, the recent reviews by IMF and the World Bank of their experience with lending with conditionality suggests that the pro-private enterprise thrust should be guided with cautious pragmatism. The efficacy of price mechanisms, which deregulation and privatization measures are intended to enhance, depends very much on the efficiency and cost of information flow and the mobility of resources. And government intervention continues to play a decisive role in ameliorating the latter factors. It is important not just to shift resources from the public to the private sector, but to remove the obstacles to efficiency through a mutually reinforcing blend of public and private activities.

The developing countries' share of world manufacturing output remained virtually stagnant around 12.7 per cent during the period 1980-1985. But owing to the much slower industrial growth expected in developed countries, a moderate recovery of manufacturing output in developing countries will bring the latter's share closer to 14 per cent of the world total by 1988. While even this implies a gain of no more than 2.3 percentage points over the 1975 level, the industry surveys given in chapter IV suggest that the developing countries' share in world output is likely to increase substantially faster in some industries than in others. A faster-than-average pace of restructuring in favour of the South has been observed, *inter alia*, for iron and steel, petroleum refineries, building materials, industrial chemicals and wood and wood products. For eight of the 28 three-digit manufacturing industries, the share of developing countries in 1988 is expected to exceed 20 per cent. These eight industries are petroleum refineries (37.5 per cent), tobacco manufactures (34.6 per cent), textiles (25.8 per cent), non-metallic mineral products other than pottery and glass (21.1 per cent), food manufactures (20.6 per cent), chemical products other than industrial chemicals (20.5 per cent), beverages (20.4 per cent) and footwear (20.2 per cent).

However, the share of developing countries remains small in core parts of the capital goods industry, such as non-electrical machinery (4.8 per cent), professional and scientific apparatus (4.3 per cent), electrical machinery (8.9 per cent) and transport equipment (8.6 per cent). In these circumstances, the issue of the South's share of world industry should be seen not just in terms of the past pattern of comparative advantage, but rather in terms of the need for developing countries to broaden the range of their comparative advantage to include industries that are increasingly technology- and skill-intensive.

The transfer of technology and the development of human resources thus remain among the central issues of international co-operation. A more solid industrial base with reasonably well-established capabilities in

the production and maintenance of capital goods would be essential for reducing the vulnerability of industry to external shocks. In addition, the emphasis should be not so much on the traditional notion of "economies of scale" at the individual plant level as on "economies of scope" that can be reaped only when a balanced structure of industrial and technological capabilities exists. These capabilities include not only the operative skills required for manufacturing activities proper, but also skills in management, marketing, maintenance and productivity improvement, research and development, training and re-training, and governmental planning and administration.

The greatest challenge of all is how to accomplish structural transformations without the stimulus of strong, world-wide, economic growth. Given the complex causes of the present global trends and their implications for developing countries, it is evident that the endeavours of these countries alone—individually or collectively—cannot restore the pace of their development process. Well-concerted remedial actions are called for on a broader international front. This is an appropriate opportunity for questioning anew how UNIDO can help to meet the challenge.

B. The role of the new UNIDO

Chapter IV of this *Global Report* includes a series of brief reviews of various UNIDO activities and operational projects in different branches of industry. These reviews reflect the very broad range and diversity of the tasks assigned to UNIDO in the fields of technical co-operation, advisory missions, investment promotion, and consultations on industrial matters. Admittedly, the extent of UNIDO involvement in sector- and country-specific problems cannot compare with the entire range of activity of the many agents of change involved in international industrial co-operation.

It would be useful briefly to consider both the nature of an international organization like UNIDO and the industrial sector with which it deals, before discussing what tasks the new UNIDO is expected to perform. This has become all the more necessary since the conversion of UNIDO into an independent specialized agency, as of 1 January 1986, with full financial and administrative autonomy. International economic relations have undergone fundamental changes during the two decades since the establishment of the old UNIDO, on 1 January 1967, and new dimensions have been added to the strategy of industrial co-operation.

One of the important implications of the "deepened international interdependence" is that the channels of diplomacy for economic development have now grown both multitudinous and multivalent, involving both State and non-State economic actors. It has not only reduced the ability of individual Governments to control the activities of many of the actors of transnational significance, but also has made the linkage between crucial issues (industry, trade, finance, science, labour, environment etc.) exceedingly complex. These trends have far-reaching implications for the role of international organizations in general, and UNIDO in particular.

For one thing, a discussion of the complex interlinkages between development policy issues, a full and precise conceptualization of which may surpass the traditional competence of diplomacy, will easily result in politicized negotiations, whereas consideration of an isolated, well-defined technical problem is less likely to have such a result. The difficulty of isolating technical problems from politically important issues has in fact tended to strain the management of multilateral programmes. For another, a large number of actors taking part in a muddled hierarchy of authority can make the co-ordination of different issue-specific activities increasingly difficult or superficial at best. Under such circumstances, both the political and economic efficiency of international organizations might seem threatened.

To the extent that this is the consequence of deepening interdependence, however, it mirrors the reality of current international relations. International organizations have been created as the products of innovation by the international community, and as such have never lacked an innovative spirit throughout the decades of their existence. It should be admitted nevertheless, that past innovations, especially during the years of world economic expansion, often consisted in creating new programmes on top of the existing complexity of programmes, to cope with every new problem. Such a practice has become increasingly unrealistic in a period of world economic slow-down.

Since an approach embracing all the diverse issues and related national interests is simply unmanageable, a more "realistic" strategy focusing on concrete problems should be adopted. The emphasis on "practical" and "action-oriented" approaches, so often heard now in international debates on development issues, reflects a growing awareness of the need for such a strategy.

When the United Nations General Assembly, on 17 November 1966, adopted resolution 2152 (XXI) establishing UNIDO, it would have been difficult to foresee the above-mentioned trends. The debates on the need for having a specialized industrial development agency within the United Nations system seem to have centred then on the lack of intergovernmental experience in handling the industrial sector, which had many features different from other public policy sectors such as agriculture, labour, health and education. Industrialization is carried out essentially by highly specialized and competitive enterprises, private and public, subject to the operation of market forces over which Governments can exercise only limited control. In other words, most of the intractable features of interdependence were already apparent in the industrial sector, limiting the prospects for effective decision-making through intergovernmental co-operation. In these circumstances, UNIDO came into being on a rather experimental basis as a semi-autonomous (non-specialized) agency within the United Nations. It took some 20 years for it to establish itself as a specialized agency. From the outset, however, it adopted "practical" approaches to multilateral co-operation, with the emphasis on country- and sector-specific problems of industrialization.

The world economic slow-down and mounting protectionist pressures have made international economic relations increasingly prone to politicization. The difficulties plaguing many international organizations seem to be due in part to various aspects of the international decision-making process itself. But there

must be no slackening of the efforts to find concrete solutions to the complex problems of industrial development. Technical co-operation, investment promotion, policy consultations and information services are among the major tools of the "nuts-and-bolts" approach adopted by UNIDO. The effective use of these tools requires a recognition of the fundamental ways in which the world industrial economy is changing. The functions of UNIDO need to be improved and strengthened in this changed context. The Organization should become an ever more dynamic instrument, of both technical and political significance, for supporting world-wide efforts to accelerate industrialization. To cope with the complexities of promoting industrial development, UNIDO has to act on several levels simultaneously and fashion tools and tactics to suit a wide variety of circumstances. Some of these complexities will now be briefly described.

Multiple levels of aggregation. Industrial development cuts across all levels of economic aggregation. It involves individual products, clusters of products bound together by backward and forward linkages, and the whole economy. It is hard to devise a strategy for single product development without touching all these levels. Industrial development also embraces many different levels of institutional aggregation. At the base, it involves a single firm, often privately owned. This firm may be part of a network of firms owned by a transnational corporation or it may be a co-operative venture. A sector-wide perspective is also needed to consider a range of different products and their substitutes. Regional, national and international levels of public policy are affected by the changing patterns of industrial organization and the competitive interaction of the agents of innovation. This multi-level interaction requires the adoption by UNIDO of measures and institutional forms flexible enough to interact with these diverse entities and that will allow it to exercise its influence over them as an international public policy organization.

Ubiquity of technical change. Industrial development is a complex problem for other reasons. Technological progress happens in all areas, but industry is the primary arena in which it is both spurred and checked by economic interests. In industry, old products give rise to new varieties; new products affect both demand and the competitive structure of industry; and innovative technologies are being combined with relatively old or mature technologies. Thus, the shifting frontiers of technology can have important implications for all countries, including developing countries at the earliest stages of industrialization. Nevertheless, the long-term scenarios regarding the socio-economic consequences of new technologies (such as computer-integrated manufacturing technologies) are still ambivalent. One hypothesis points to the likelihood of greater centralization in the organization of world industry, overshadowing the industrialization efforts in peripheral regions; another hypothesis favours greater decentralization and increased specialization, facilitating the efforts in peripheral regions. These different scenarios could affect the industrialization strategy of developing countries quite differently. UNIDO should keep abreast of new developments in frontier technologies to ensure the extension of their benefits to developing countries.

Competitive interdependence between countries at different stages of industrial development. The changing global pattern of industrialization presents a formidable challenge. Industrial development in one country may be regarded as industrial restructuring in another. If the global economy fails to expand, the impact of "competitive interdependence" becomes a domestic social and political issue. There will be just as many declining industries in the North as there will be new competitive industries in the South. The restructuring of world industry thus makes it necessary for UNIDO to enhance its capability of monitoring the market forces that determine the flows of trade, foreign direct investment and technology, and the policy changes in different countries that affect the direction and pace of those flows. UNIDO should be able to bring its influence to bear within the United Nations system to counter moves towards protectionism. Furthermore, given the increasing importance of South-South co-operation, there is a need for sharper insight into the process of technology diffusion from one developing country to another, which is accompanied by indigenous innovation involving the adaptation of the original technology to produce varieties and process features matching different segments of the Southern market.

C. Towards new concepts and approaches for co-operation in industrial development

The new Constitution of UNIDO, adopted by the United Nations Conference on the Establishment of UNIDO as a Specialized Agency in April 1979, sets the primary objective of the Organization to be the promotion and acceleration of industrial development in developing countries "with a view to assisting in the establishment of a new international economic order". Indeed, the Lima Declaration had carried the hope that a concerted action on the part of Governments could facilitate the redeployment of industry in the North-South context, and that UNIDO would be able to play its role as an active catalyst in that world-wide process. The Third General Conference of UNIDO, held at New Delhi in 1980, placed renewed emphasis on this long-term goal. The changes in the economic and industrial climate since then have profoundly altered the parameters. But these changes ought not obscure the long-term vision of UNIDO. The important question now is how UNIDO can better contribute to the achievement of that long-term goal through its concrete programmes and how these programmes will be adapted to the changing climate of international economic relations. Some of the guiding principles of current UNIDO activities are described below.

1. Ensuring greater operational efficiency

The multiple levels of aggregation, and the changing notion of public goods from one level to another (and from one country to another) with which UNIDO has

to interact, should not reduce the effectiveness of UNIDO as a promoter of industrialization. Since micro-level problems can be solved only in a proper macro-economic environment, there is much greater scope for policy studies and programme-oriented research with a sharper country and sectoral focus to guide the policy for technical co-operation. Identifying new opportunities for joint ventures, technology transfer and other forms of industrial co-operation, and ensuring appropriate national and international support to remove the obstacles to their realization, must be seen as one of the major functions of UNIDO. The UNIDO System of Consultations is a vital link in such an integrated approach. The Consultations have in fact been urged to concentrate on the concrete problems of specific groups of developing countries, from the point of view not only of industrial policy, but also of initiating and promoting country- and sector-specific co-operation projects. The simultaneous participation of experts, industry representatives and government policy-makers in such meetings is a key to generating a politically and technically sound basis for UNIDO action.

Many thorny problems need to be overcome in order to improve the effectiveness of conventional forms of technical co-operation. The development of human resources is of central importance for the development process as a whole, and every instrument of co-operation may be said to serve that end. Not infrequently, however, the technology and know-how imparted to specific individuals are not disseminated quickly to others. A successful strategy for human resource development requires greater understanding of the social process of technology diffusion, not only its formal institutional mechanisms but also how those mechanisms operate in society. Even more important in the context of industrialization is the development of entrepreneurship. Knowledge of management techniques may be relatively easily acquired through formal training, but "economic minds" or business acumen can only develop in an environment that offers industrial opportunities with prospects of reward. Similar social and organizational considerations would be important in improving the local mechanisms for university-industry, or research-production, links.

Well-focused policy-oriented studies on these socio-economic aspects of industrial co-operation would be essential to make the "nuts-and-bolts" approach of UNIDO still more effective.

2. *Closer interface between financial and technical co-operation*

The integration of technical with capital co-operation has always been a difficult problem for intergovernmental programmes of industrialization. Some bilateral co-operation agencies have already succeeded in ending the traditional division between the two forms of co-operation, at least at the project conception phase. Others are still constitutionally required to manage the two types of programme separately. Indeed, the basic rules and principles governing their operation are quite different. Capital assistance is inevitably geared to the notion of "bankability", or "payback" period within a limited time frame, while technical co-operation focuses primarily on generating what constitutes "externalities" for individual industrial concerns in a longer-term perspective. UNIDO has not been established as an agency for capital assistance, but it has to be innovative in producing an improved interface of its technical co-operation instruments with financial institutions.

The international debt problem has reached such dimensions that many associate it with the symptoms of a more deeply rooted crisis of development. Developing countries have already suffered once in this decade from a sudden hike in real interest rates as the financial policies of developed countries switched to greater fiscal orthodoxy. But now, in a sudden reversal, the international financial system, which once sustained the lending rush, is ready to write off so much of the earlier development commitment as "sunken costs". Institutional arrangements for reducing investment risks is one thing; identifying and developing investment opportunities is another. However, both are needed effectively to overcome the excessive risks currently associated with the investment potential of developing countries. With its instruments of investment promotion and supporting technical co-operation, UNIDO should play an active part in this endeavour.

Developing countries have set up a number of industrial finance institutions, including regional development banks and national development finance companies. Great scope exists for improved interaction between UNIDO instruments and these financial institutions. The experience of UNIDO in investment promotion has shown that closer co-operation with financial institutions in developing countries facilitates not only the identification of investors, but also the preparation of pre-investment studies and often the identification of joint venture partners. Experience also shows that the access of local entrepreneurs to project ideas and related technical assistance is very often just as important as their access to credit. Moreover, in its project development and promotion work UNIDO should devote greater attention to fulfilling its mandate as a promoter of industrialization on a broader front, encompassing hitherto "underprivileged" industries.

3. *Closer interaction with business enterprises*

Reaching out to the real agents of change in industry, which for the most part are profit-seeking enterprises, is not a straightforward task for an intergovernmental organization. Even within a given country, no clear-cut criteria exist as regards how far and in what way the Government should intervene in private markets. At the international level, these criteria are even more ambiguous and changeable. UNIDO has developed a variety of contacts with non-governmental bodies and enterprises through its investment promotion, technology transfer and information activities, and to some extent through the System of Consultations. More recently UNIDO has established a new experimental facility, entitled Special Programmes and Activities, which enters into direct co-operation arrangements with non-governmental organizations and business enterprises. Expanded avenues of co-operation with

business enterprises can bring greater diversity to the work of UNIDO.

The efficiency criteria applicable to profit-seeking enterprises and the time horizon associated with their perception of benefits and costs differ from those to which public policy organizations are accustomed. Rigid rules and procedures, which might improve both the bureaucratic efficiency and the political health of a public organization, are likely to stifle the innovative minds needed for case-by-case arrangements. The spirit of accommodating, promptly and flexibly, the long-term interests of the parties concerned is essential, together with a habit of carefully judging the political and economic soundness of the projects to be promoted. The principle of "non-excludability" must also be respected in planning UNIDO intervention in firm-specific co-operation deals. Each experience should be assessed in terms of its reproducibility elsewhere or the lessons of universal validity that could be broadly disseminated. The task of UNIDO as a public policy organization consists ultimately in promoting the cause of international equity, bearing always in mind the long-term development benefits to be gained by the weaker partners.

4. Multilateralization of bilateral initiatives

A measure of international co-ordination and multilateral action, such as the recent attempts by the Governments of the most powerful developed market economies to regulate exchange rates, must sooner or later be extended to policies encompassing the supply side of structural adjustments, and thus to measures more directly conducive to longer-term international development. International industrial co-operation should then be viewed as an integral part of broader policy co-ordination to manage the global economy.

Bilateral initiatives have to be fully respected, since they represent the sovereign decisions of independent countries. In fact, development co-operation remains overwhelmingly bilateral. UNIDO has been equipped since 1978 with a special facility called the United Nations Industrial Development Fund to supplement the assistance provided by UNDP resources. Moreover, the new UNIDO Constitution gives the Director-General the right to accept voluntary contributions —including gifts, bequests and grants directly from non-governmental organizations and individual business enterprises—in the form of special trust funds. UNIDO has thus been involved for a number of years in the task of combining multilateral resources with bilateral (special-purpose) contributions. Both multilateral and bilateral co-operation clearly have a common role to play in the development field, and there is room for the multilateralization of bilateral initiatives.

The new UNIDO should be able to strengthen its position as a leading innovator in international industrial co-operation by improving its ability to explore and experiment with new approaches. This is especially the case where individual bilateral initiatives might be frustrated for political reasons, or because the results have been uncertain, or because there has been a lack of well-tested know-how.

5. Search for innovative action proposals

Article 2 *(c)* of the Constitution of UNIDO provides the basis for setting up a special mechanism within UNIDO for translating the foregoing principles into concrete programmes of action. It reads as follows:

"The Organization shall . . . create new and develop existing concepts and approaches in respect of industrial development on global, regional and national, as well as on sectoral levels, and carry out studies and surveys with a view to formulating new lines of action directed towards harmonious and balanced industrial development, with due consideration for the methods employed by countries with different socio-economic systems for solving industrialization problems."

The Industrial Development Board at its second session in 1986 established an Open-Ended Working Group to carry out a thorough review of the implications of this article and develop specific guidelines for elaborating and implementing "new concepts and approaches for co-operation in industrial development". By April 1987 the Group had met five times to assist the Director-General in preparing a new report for consideration by the Board at its third session and for presentation at the General Conference of UNIDO, Second Session (November 1987).

The search for innovative concepts and approaches inevitably requires continuous and repeated experimentation. At its first meeting, in February 1987, the Special Advisory Group established by the Director-General to advise him regularly on the direction and substance of UNIDO programmes looked, *inter alia*, at the framework for developing new concepts and approaches.

Both of the above-mentioned Groups have recommended a "realistic" strategy responding to the ever changing conditions of world industry and concentrating on selected major issues that call for urgent attention. The following have been singled out as "target areas" of international industrial co-operation:

(a) Industrial rehabilitation: a properly integrated approach to the technological, financial, managerial, manpower and sectoral policy aspects of rehabilitating ailing industries in developing countries, especially debt-ridden countries;

(b) Industrial maintenance and instrumentation: innovative approaches to strengthening industrial maintenance capabilities and related support policies in developing countries; special care is required in coping with the implications for developing countries of the advances in instrumentation technology arising from the micro-electronics revolution;

(c) Promotion and strengthening of small-scale industries: improved policy and enhanced action programmes at both national and international levels, with emphasis on the utilization of locally available resources and markets, on dynamic linkages to larger industries of national and regional significance, and on mechanisms for promoting co-operation ventures in both the North-South and the South-South context;

(d) Promotion of long-term industrial partnerships between local communities in developed and developing countries: on regional (intra-country) development issues, approaches designed to stimulate exposure of

local industrial enterprises and institutions to international development, thus paving the way for "periphery-to-periphery" co-operation;

(e) Human resources development: a more thorough assessment of demand-supply gaps in different categories of skills needed for industrial development in priority sectors in developing countries, and initiatives designed to advance the multilateralization of bilateral training programmes;

(f) Development and transfer of technology: strengthening and improving technological advisory facilities and networks linked to industrial promotional activities, with emphasis on the promotion of co-operation in research and development between countries at different levels of technological and industrial development.

The guidelines for action relating to the above-mentioned target areas might result in some new projects of experimental significance. Emphasis will be laid generally on possibilities for broadening co-operation between UNIDO and industrial concerns in the private and public sectors, stimulating the flow of financial resources into productive investment, linking UNIDO inputs to appropriate bilateral initiatives, and taking full advantage of individual experiments by carrying out timely policy studies and industrial-promotional work as an integral part of project activities.

Future work on those target problem areas is likely to include more detailed reviews of the experience gained by UNIDO and various national and international agencies in tackling specific problems. The intergovernmental debates on priority issues and the experience with relevant operational projects reviewed in conjunction with the implementation of Article 2 *(c)* will be utilized as a basis for further improvements in UNIDO technical co-operation and other programmes. The outcome of these and other innovative efforts in international industrial co-operation, as deemed relevant for the interest of the global public, may be reported in future issues of the *Global Report*.

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Statistical Annex

World Industry Development Indicators

Technical notes

1. Sources for the following country tables are:

(a) The UNIDO data base of industrial statistics;

(b) National Accounts Statistics from the United Nations, Department of International Economic and Social Affairs, Statistical Office (all entries followed by "/na") supplemented by other sources (listed below under item 7);

(c) Population figures from United Nations Demographic Statistics and the United Nations Monthly Bulletin of Statistics. The population figures used in the GDP per capita forecast (1985-1988) are based on the "World population prospects as assessed in 1982" (United Nations, Department of International Economic and Social Affairs, 1985), medium variant;

(d) Estimates and forecasts of GDP and MVA (manufacturing value added from National Accounts Statistics and for 28 industrial branches) by UNIDO/ SR/Global Studies Branch.

2. All values are in millions of U.S. dollars at current prices, except where otherwise indicated.

3. Figures followed by "/c" are in 1980 constant prices.

4. For centrally planned economies the net material product (NMP) replaces the GDP.

5. The annex is separated into two parts. The first part consists of pages for each of 82 countries and areas. This sample was used to derive the sectoral forecasts of manufacturing value added for 28 industrial branches. The pages contain diagrams of industrial structural change, graphs of GDP and MVA growth rates (described below under items 6 and 7) and tables (described below under items 8 to 13).

The second part of the annex contains a short table for each of the remaining countries and areas.

The graphs of GDP and MVA growth, GDP per capita and manufacturing share in GDP presented on the page for West Malaysia are derived from data for Malaysia. This is because there exist only data from National Accounts Statistics for Malaysia, while Industrial Statistics are reported only for West Malaysia.

6. The diagram of industrial structural change is based on the value added in 1980 constant prices. For each branch an index number for the periods 1980, 1985 and 1988 is calculated from the base year 1975. The index number determines the distance from the origin of the star-diagram. For each year the index numbers are connected by a line which reflects the typical "shape" of expansion for the specific country. Since the size of expansion (absolute values of the index numbers) is different in each country, a different scale is used in each diagram. The largest index number of all branches is therefore given below the right end of the horizontal axis. The two numbers in the box on the upper right-hand side are: g, the average annual growth rate for the period 1975 to 1988; and θ, the index of structural change (defined below) for the same period.

7. The graphs of GDP and MVA growth rates are based on data supplied by the United Nations, Department of International Economic and Social Affairs, Statistical Office. For countries and periods for which no such data were available, the growth rates were taken from one of the following sources:

(a) National statistical institute of the specific country;

(b) United Nations regional economic commission for the specific country;

(c) *International Financial Statistics* (International Monetary Fund);

(d) *National Accounts, Main Aggregates* (OECD, Department of Economics and Statistics);

(e) *World Outlook* and *Quarterly Economic Review* (The Economist Intelligence Unit);

(f) *World Bank Atlas*;

(g) *Centrally Planned Economies, Economic Overview* (The Conference Board, Inc.);

(h) Various economic journals and weekly magazines;

(i) Abecor European Bank Service;

(j) "Report on world economic prospects 1984-1986" (United Nations, Department of International Economic and Social Affairs, Projections and Perspective Studies Branch, project LINK).

The growth rates from 1986 to 1988 for all countries (before 1986 also for those countries without reported data) were projected using:

(a) The long-term trend in GDP;

(b) The cyclical deviations from that trend; and

(c) The historically observed dependence of the specific country on a country or group (e.g. United States, European Economic Community or Japan).

The growth rates of MVA for the periods 1986 to 1988 were derived from the GDP growth rates. Four different types of linear regressions relating the two quantities were used for this purpose.

The growth rates of manufacturing value added in 28 industrial branches for the periods 1986 to 1988 were projected only for a sample of 82 countries. Again various national sources and UNIDO estimates were used to improve the coverage of the data. The forecasts are based on estimates of the contribution of two components: *(a)* the dependence of the sector on the overall economic situation in the country expressed in terms of GDP; and *(b)* the sector-specific time behaviour expressed in terms of a lag-structure of the value added of the sector.

8. The figures for value added taken from national accounts and from industrial statistics differ mainly because of two reasons: *(a)* the industrial census data do not include the activities of firms or enterprises with less than a certain number of employees. Ideally this number equals five, but varies across countries and branches; *(b)* the industrial census data include the receipts for and exclude the costs of non-industrial activities. There is no size limit for value added data of national accounts, and non-industrial activities are not considered. For further information refer to *International Recommendations for Industrial Statistics*, Statistical Papers, Series M, No. 48, Rev.1 (United Nations publication, Sales No. E.83.XVII.8).

9. The figures under the item "profitability" are defined as follows:

Intermediate input = 100 (gross output−value added)/ gross output

Wages and salaries = 100 (wages and salaries)/gross output

Operating surplus = 100 (value added−wages and salaries/ gross output

10. The items "profitability" and "productivity" are calculated for total manufacturing value added. A branch was only included if all required variables (gross output, value added, wages and salaries and employment) were reported.

11. For the calculation of the structural indices and the value of θ in the diagram of industrial structural change, the value added in constant 1980 prices has been used.

The measure for structural change is defined as:

$$\cos\theta = \frac{\sum_i s_i(t) \cdot s_i(t-1)}{\sqrt{\left(\sum_i s_i(t)^2\right) \cdot \left(\sum_i s_i(t-1)^2\right)}}$$

where $s_i(t)$ is the share of the i branch of value added in total value added in the year t.

The value θ can be interpreted as the angle between the two vectors $s_i(t-1)$ and $s_i(t)$ measured in degrees.

The theoretical maximum value of θ is 90 degrees.

12. The item "growth rate/structural change" is measured in per cent of real value added growth per degree of structural change between the periods t−1 and t.

13. The degree of specialization is defined as follows:

$$h = 100\left(1 + \frac{\sum_i s_i \cdot \ln s_i}{h_{max}}\right)$$

where s_i is defined as above and $h_{max} = \ln$ (number of branches); ln is the natural logarithm.

If the shares of all branches are equal, the degree of specialization equals 0. If only one branch exists, the value is 100.

Summary of indicators

/na	value originating from national accounts statistics
/c	in 1980 constant prices
/e	estimated by UNIDO/SR/GLO
/f	forecast by UNIDO/SR/GLO
. . .	no value available
—	value is less than a half of the unit
n.a.	not available

Regional classification of countries and territories:

Country or territory	UNITAD region		page
AFGHANISTAN	Indian Subcontinent	(IN)	323
ALBANIA	Centrally Planned Europe incl. USSR	(EE)	323
ALGERIA	North Africa and Western Asia	(NE)	241
ARGENTINA	Latin America	(LA)	242
AUSTRALIA	Other Developed	(OD)	243
AUSTRIA	Western Europe (North)	(WE)	244
BAHAMAS	Latin America	(LA)	323
BANGLADESH	Indian Subcontinent	(IN)	245
BARBADOS	Latin America	(LA)	323
BELGIUM	Western Europe (North)	(WE)	246
BELIZE	Latin America	(LA)	323
BENIN	Tropical Africa (Sub-Sahara)	(TA)	323
BERMUDA	North America	(NA)	324
BHUTAN	Indian Subcontinent	(IN)	324
BOLIVIA	Latin America	(LA)	247
BOTSWANA	Tropical Africa (Sub-Sahara)	(TA)	324
BRAZIL	Latin America	(LA)	248
BRUNEI DARUSSALAM	South-East Asia	(AS)	324
BULGARIA	Centrally Planned Europe incl. USSR	(EE)	249
BURKINA FASO	Tropical Africa (Sub-Sahara)	(TA)	324
BURMA	Indian Subcontinent	(IN)	324
BURUNDI	Tropical Africa (Sub-Sahara)	(TA)	325
CAMEROON	Tropical Africa (Sub-Sahara)	(TA)	250
CANADA	North America	(NA)	251
CAPE VERDE	Tropical Africa (Sub-Sahara)	(TA)	325
CENTRAL AFRICAN REPUBLIC	Tropical Africa (Sub-Sahara)	(TA)	252
CHAD	Tropical Africa (Sub-Sahara)	(TA)	325
CHILE	Latin America	(LA)	253
CHINA	Centrally Planned Asia	(OA)	325
COLOMBIA	Latin America	(LA)	254
COMOROS	Tropical Africa (Sub-Sahara)	(TA)	325
CONGO	Tropical Africa (Sub-Sahara)	(TA)	325
COSTA RICA	Latin America	(LA)	326
COTE D'IVOIRE	Tropical Africa (Sub-Sahara)	(TA)	326
CUBA	Latin America	(LA)	326
CYPRUS	North Africa and Western Asia	(NE)	255
CZECHOSLOVAKIA	Centrally Planned Europe incl. USSR	(EE)	256
DENMARK	Western Europe (North)	(WE)	257
DJIBOUTI	Tropical Africa (Sub-Sahara)	(TA)	326
DOMINICAN REPUBLIC	Latin America	(LA)	258
ECUADOR	Latin America	(LA)	259
EGYPT	North Africa and Western Asia	(NE)	260
EL SALVADOR	Latin America	(LA)	261
EQUATORIAL GUINEA	Tropical Africa (Sub-Sahara)	(TA)	326
ETHIOPIA	Tropical Africa (Sub-Sahara)	(TA)	262
FIJI	South-East Asia	(AS)	326
FINLAND	Western Europe (North)	(WE)	263
FRANCE	Western Europe (North)	(WE)	264
FRENCH GUIANA	Latin America	(LA)	327
FRENCH POLYNESIA	South-East Asia	(AS)	327
GABON	Tropical Africa (Sub-Sahara)	(TA)	327
GAMBIA	Tropical Africa (Sub-Sahara)	(TA)	327
GERMAN DEMOCRATIC REPUBLIC	Centrally Planned Europe incl. USSR	(EE)	265
GERMANY, FEDERAL REPUBLIC OF	Western Europe (North)	(WE)	266
GHANA	Tropical Africa (Sub-Sahara)	(TA)	267
GREECE	Western Europe (South)	(WE)	268
GUADELOUPE	Latin America	(LA)	327
GUATEMALA	Latin America	(LA)	269
GUINEA	Tropical Africa (Sub-Sahara)	(TA)	327
GUINEA-BISSAU	Tropical Africa (Sub-Sahara)	(TA)	328
GUYANA	Latin America	(LA)	328
HAITI	Latin America	(LA)	328
HONDURAS	Latin America	(LA)	270
HONG KONG	South-East Asia	(AS)	271
HUNGARY	Centrally Planned Europe incl. USSR	(EE)	272
ICELAND	Western Europe (North)	(WE)	328
INDIA	Indian Subcontinent	(IN)	273
INDONESIA	South-East Asia	(AS)	274
IRAN (ISLAMIC REPUBLIC OF)	North Africa and Western Asia	(NE)	275
IRAQ	North Africa and Western Asia	(NE)	276
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JAMAICA	Latin America	(LA)	280
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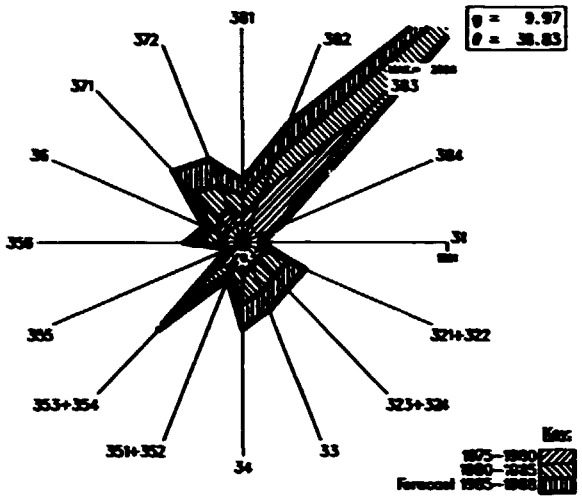
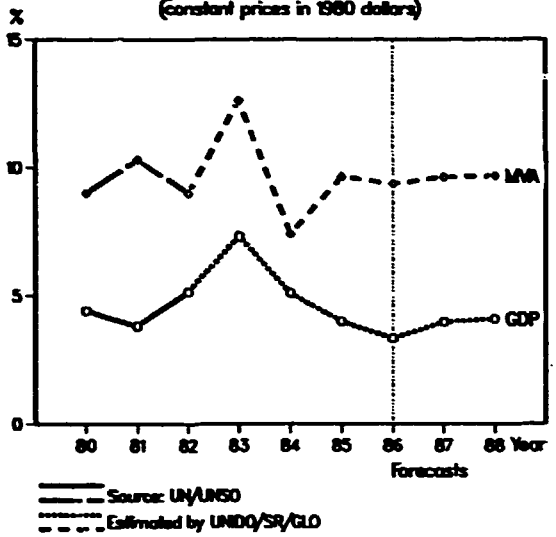
JORDAN	North Africa and Western Asia	(NE)	328

Industrial structural change
(index of value added: 1975=100)

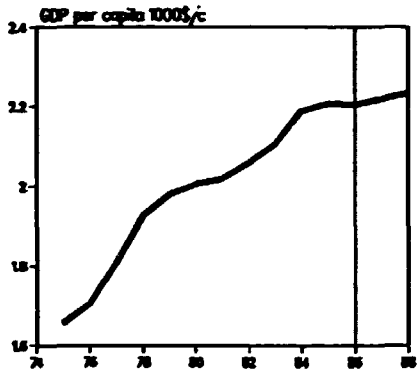


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

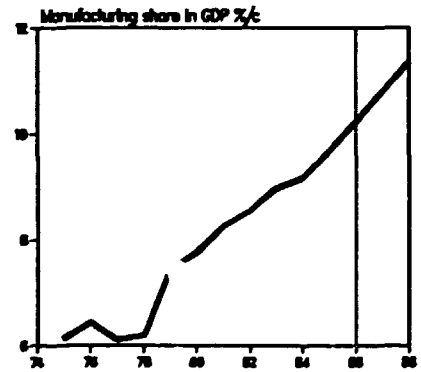


	1975	1980	1985
GDP: /na,c (in million dollars)	28547	37441	47841
Per capita /na,c (in dollars)	1657	2006	2207
Manufacturing share /na,c (%)	6.1	7.8	9.7 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	1628	2906	4631 /e
Value added (in million dollars)	1485	4477	7194 /e
Industrial production index	100	154	252
Gross output (in million dollars)	4278	9483 /e	13857 /e
Employment (in thousands)	191	329	422 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	65	53 /e	48 /e
Wages and salaries (%)	18	23 /e	26 /e
Operating surplus (%)	16	25 /e	26 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	22406	28781 /e	32861 /e
Value added / worker	7672	13589	17059 /e
Average wage	4114	8529 /e	8437 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	4.12	11.69	2.44
in percentage of θ in 1970-1975	70	198	42
Growth rate / structural change	1.63	1.00	3.95
Degree of specialization	19.8	17.2	18.0
-VALUE ADDED: (in million dollars)			
311 Food products	303	764	1174 /e
313 Beverages	63	158	214 /e
314 Tobacco products	81	205	348 /e
321 Textiles	125	382	567 /e
322 Wearing apparel	101	308	449 /e
323 Leather and fur products	36	87	149 /e
324 Footwear	41	100	154 /e
331 Wood and wood products	51	109	183 /e
332 Furniture and fixtures	24	51	86 /e
341 Paper and paper products	51	127	221 /e
342 Printing and publishing	8	16	13 /e
351 Industrial chemicals	5	9	10 /e
352 Other chemical products	24	42	38 /e
353 Petroleum refineries	112	201	295 /e
354 Miscellaneous petroleum and coal products	4	7	13 /e
355 Rubber products	4	7	7 /e
356 Plastic products	8	15	17 /e
361 Pottery, china and earthenware	5	22	39 /e
362 Glass and glass products	7	35	60 /e
369 Other non-metal mineral products	87	438	770 /e
371 Iron and steel	95	440	766 /e
372 Non-ferrous metals	7	31	54 /e
381 Metal products	72	328	569 /e
382 Non-electrical machinery	33	148	261 /e
383 Electrical machinery	33	148	261 /e
384 Transport equipment	86	253	437 /e
385 Professional and scientific equipment	3	14	14 /e
390 Other manufacturing industries	20	33	47 /e

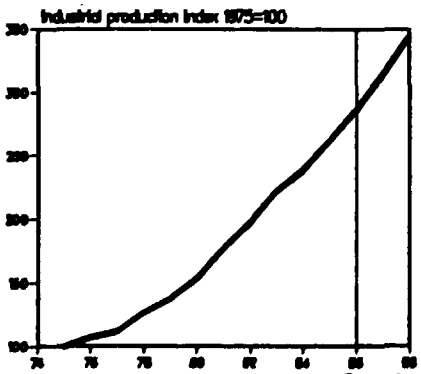
GDP per capita 1000$/c



Manufacturing share in GDP %/c

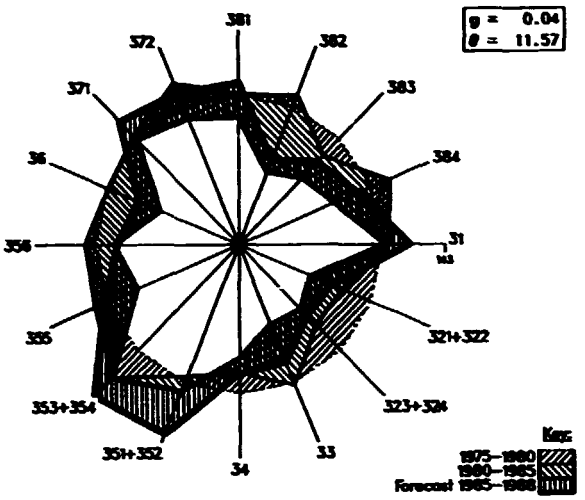


Industrial production index 1975=100

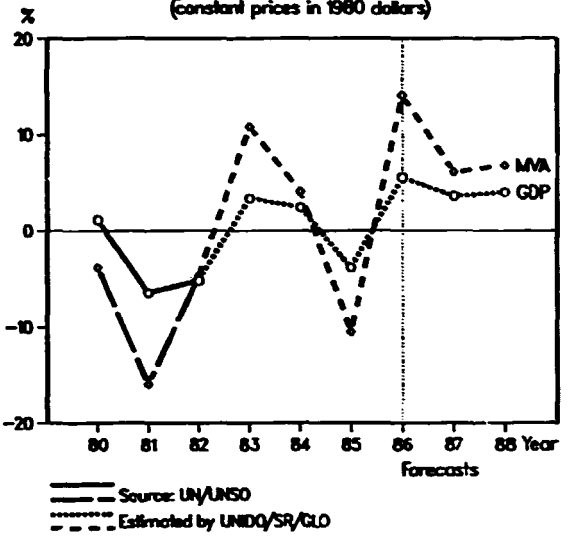


For source, footnotes and comments see "Technical notes" above.

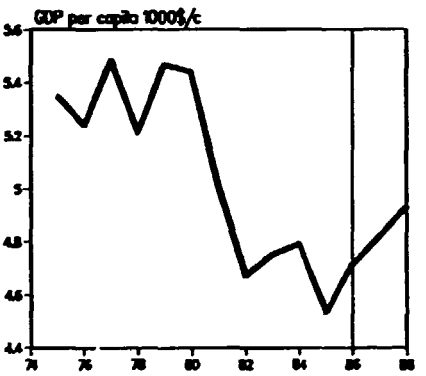
Industrial structural change
(Index of value added: 1975=100)

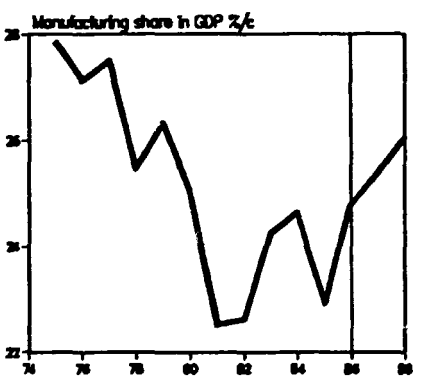


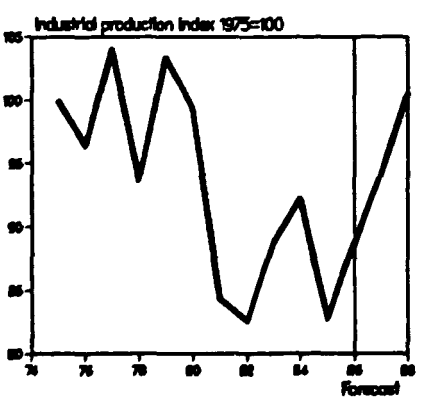
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	139318	153614	138640	
Per capita /na,c (in dollars)	5348	5440	4536	
Manufacturing share /na,c (%)	27.9	25.1	22.9	
MANUFACTURING:				
Value added /na,c (in million dollars)	38817	38489	31786	
Value added (in million dollars)	10936	33435	16013	
Industrial production index	100	99	83	
Gross output (in million dollars)	32510	58796	13198	/e
Employment (in thousands)	1763	1306	1113	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	66	43	-21	/e
Wages and salaries (%)	11	15	30	/e
Operating surplus (%)	23	42	92	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	18499	45032	11860	/e
Value added / worker	6204	25608	14390	/e
Average wage	1988	6732	3519	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	4.24	3.95	5.87	
in percentage of θ in 1970-1975	129	121	179	
Growth rate / structural change	-0.41	-0.95	-1.74	
Degree of specialization	11.5	12.6	14.8	
-VALUE ADDED: (in million dollars)				
311 Food products	1848	6167	3656	/e
313 Beverages	495	892	559	
314 Tobacco products	118	698	440	
321 Textiles	1037	2325	929	
322 Wearing apparel	286	737	271	
323 Leather and fur products	70	293	139	
324 Footwear	81	222	104	
331 Wood and wood products	142	388	150	
332 Furniture and fixtures	87	247	97	
341 Paper and paper products	332	911	477	
342 Printing and publishing	336	861	494	
351 Industrial chemicals	346	998	516	
352 Other chemical products	507	1749	1185	
353 Petroleum refineries	368	1210	704	
354 Miscellaneous petroleum and coal products	32	153	93	
355 Rubber products	213	750	328	
356 Plastic products	120	423	219	
361 Pottery, china and earthenware	50	140	38	
362 Glass and glass products	120	450	138	
369 Other non-metal mineral products	454	1350	525	
371 Iron and steel	488	1741	977	
372 Non-ferrous metals	124	285	128	
381 Metal products	755	3069	1173	
382 Non-electrical machinery	661	1991	566	
383 Electrical machinery	471	1263	509	
384 Transport equipment	1286	3829	1445	
385 Professional and scientific equipment	74	113	51	
390 Other manufacturing industries	86	201	96	

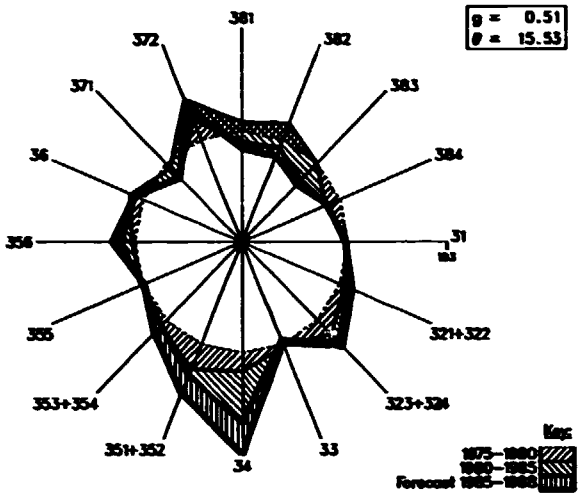




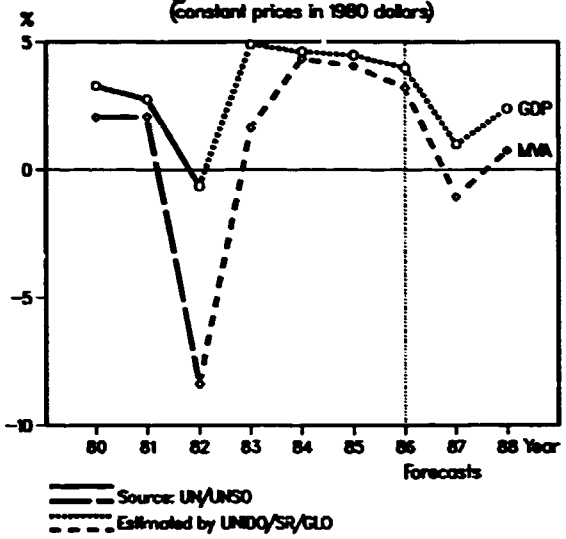


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)



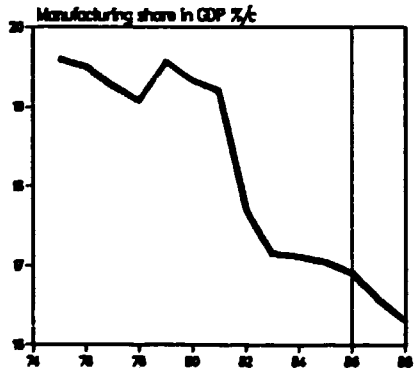
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



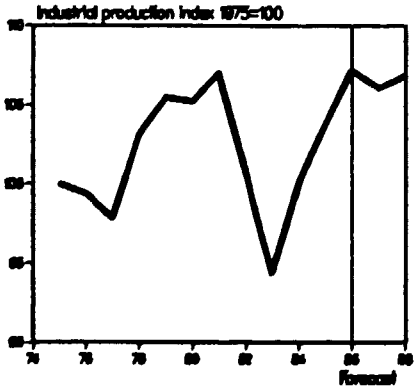
	1975	1980	1985	
GDP: /na,c (in million dollars)	132439	151642	177552	
Per capita /na,c (in dollars)	9719	10319	11310	
Manufacturing share /na,c (%)	19.6	19.3	17.0	
MANUFACTURING:				
Value added /na,c (in million dollars)	25951	29313	30258	
Value added (in million dollars)	19937	29173	26849	
Industrial production index	100	105	104	
Gross output (in million dollars)	46801	76474	68731	/e
Employment (in thousands)	1231	1139	995	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	57	61	61	/e
Wages and salaries (%)	24	20	20	/e
Operating surplus (%)	19	18	19	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	38019	66263	69084	/e
Value added / worker	16195	25613	26786	/e
Average wage	9071	13356	13484	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	2.57	2.42	3.69	
in percentage of θ in 1970-1975	67	63	96	
Growth rate / structural change	0.21	-0.10	1.01	
Degree of specialization	12.8	11.3	11.9	
-VALUE ADDED: (in million dollars)				
311 Food products	2773	3993	4060	
313 Beverages	624	786	782	
314 Tobacco products	177	248	197	
321 Textiles	713	1050	992	
322 Wearing apparel	575	821	740	
323 Leather and fur products	71	93	75	/e
324 Footwear	119	223	210	
331 Wood and wood products	780	1052	950	/e
332 Furniture and fixtures	328	505	493	/e
341 Paper and paper products	544	744	633	/e
342 Printing and publishing	1132	1818	1886	/e
351 Industrial chemicals	564	969	864	/e
352 Other chemical products	772	1186	1143	/e
353 Petroleum refineries	170	323	234	/e
354 Miscellaneous petroleum and coal products	21	30	22	/e
355 Rubber products	291	341	252	/e
356 Plastic products	519	831	794	/e
361 Pottery, china and earthenware	35	46	36	/e
362 Glass and glass products	161	246	237	/e
369 Other non-metal mineral products	810	1183	1077	/e
371 Iron and steel	1383	1920	1517	/e
372 Non-ferrous metals	729	1473	1140	/e
381 Metal products	1629	2467	2158	
382 Non-electrical machinery	1609	2091	1897	
383 Electrical machinery	1102	1351	1275	
384 Transport equipment	2066	2830	2464	
385 Professional and scientific equipment	164	280	287	/e
390 Other manufacturing industries	176	283	222	/e

GDP per capita 1000$/c

Manufacturing share in GDP %/c

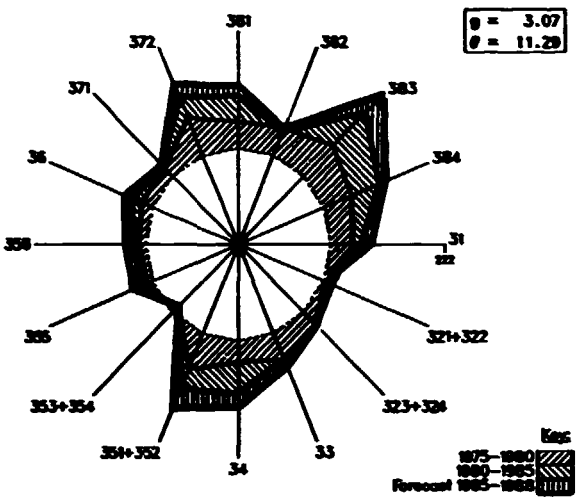


Industrial production index 1975=100

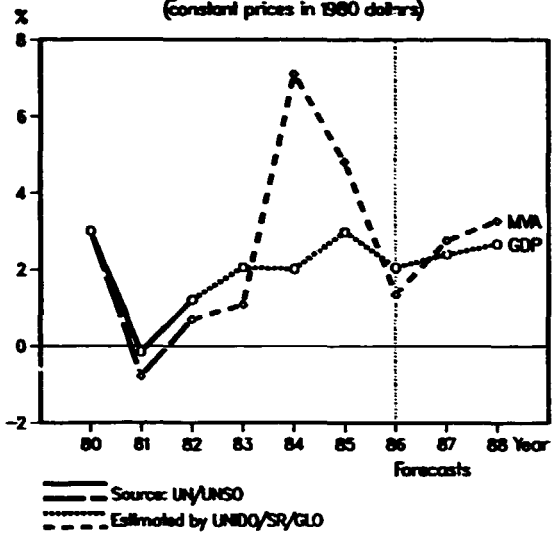


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

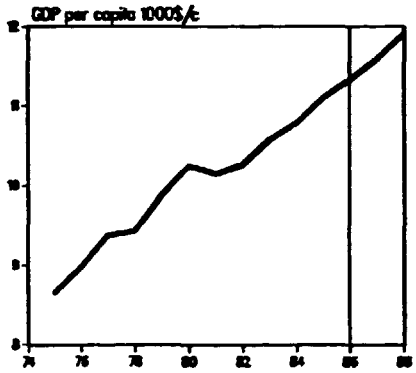


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

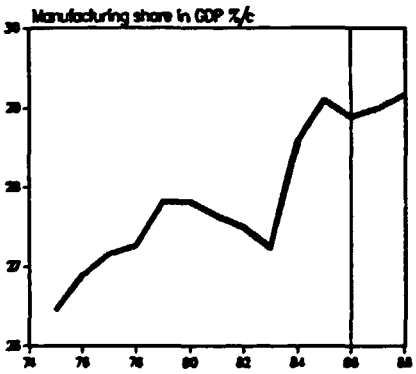


	1975	1980	1985	
GDP: /na,c (in million dollars)	64978	76833	83306	
Per capita /na,c (in dollars)	8641	10244	11104	
Manufacturing share /na,c (%)	26.5	27.8	29.1	
MANUFACTURING:				
Value added /na,c (in million dollars)	17188	21384	24236	
Value added (in million dollars)	9432	18085	16027	
Industrial production index	100	125	138	
Gross output (in million dollars)	26980	54686	46886	/e
Employment (in thousands)	794	824	772	
-PROFITABILITY:(in percent of gross output)				
Intermediate input (%)	65	67	66	/e
Wages and salaries (%)	20	19	18	/e
Operating surplus (%)	15	14	16	/e
-PRODUCTIVITY:(in dollars)				
Gross output / worker	33973	66365	60696	/e
Value added / worker	11877	21952	20779	/e
Average wage	6669	12799	10815	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.94	2.48	2.70	
in percentage of θ in 1970-1975	127	80	87	
Growth rate / structural change	-1.63	1.12	1.79	
Degree of specialization	10.7	11.4	11.5	
-VALUE ADDED:(in million dollars)				
311 Food products	899	1752	1578	/e
313 Beverages	307	474	391	/e
314 Tobacco products	319	807	728	
321 Textiles	464	904	677	
322 Wearing apparel	313	512	403	
323 Leather and fur products	39	63	41	
324 Footwear	103	223	164	
331 Wood and wood products	113	192	276	/e
332 Furniture and fixtures	509	986	900	/e
341 Paper and paper products	350	645	551	
342 Printing and publishing	307	726	619	
351 Industrial chemicals	346	663	528	/e
352 Other chemical products	291	534	419	/e
353 Petroleum refineries	141	177	99	
354 Miscellaneous petroleum and coal products	16	36	28	/e
355 Rubber products	148	258	213	/e
356 Plastic products	123	281	264	/e
361 Pottery, china and earthenware	28	63	56	/e
362 Glass and glass products	102	244	243	
369 Other non-metal mineral products	536	894	704	/e
371 Iron and steel	687	1225	1011	
372 Non-ferrous metals	102	280	229	
381 Metal products	971	1642	1721	
382 Non-electrical machinery	747	1766	1260	
383 Electrical machinery	830	1615	1624	
384 Transport equipment	466	943	1067	
385 Professional and scientific equipment	115	161	130	/e
390 Other manufacturing industries	80	143	137	/e

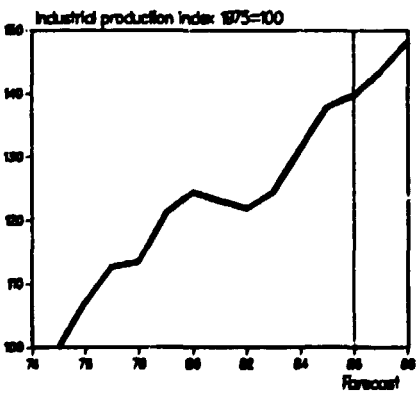
GDP per capita 1000$/c



Manufacturing share in GDP %/c

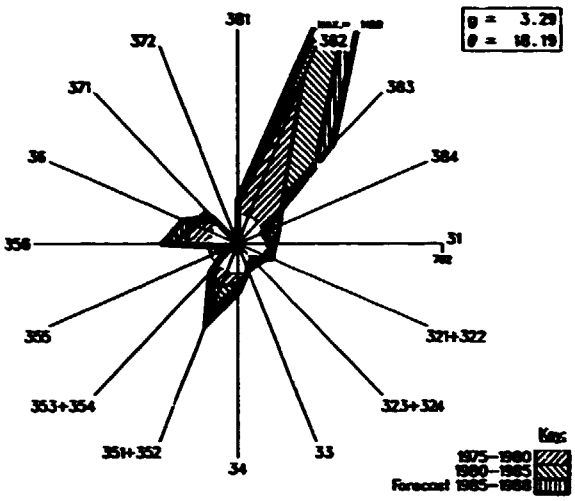


Industrial production index 1975=100

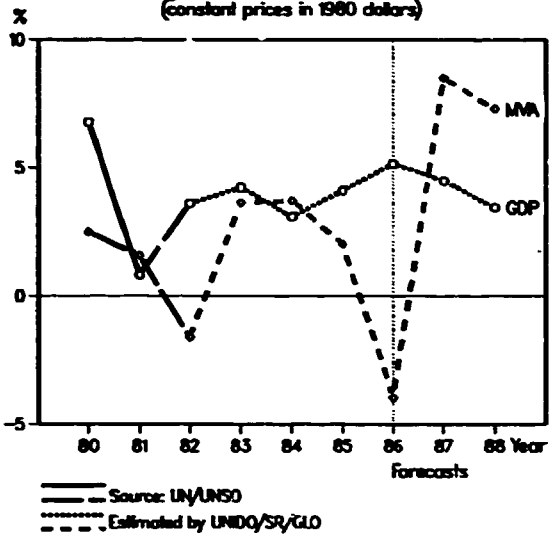


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

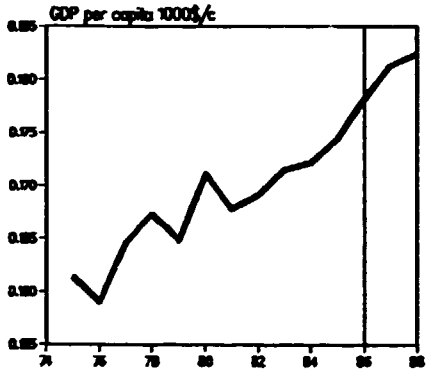


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

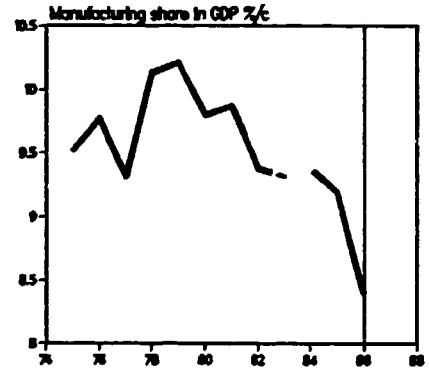


	1975	1980	1985	
GDP: /na,c (in million dollars)	12364	15094	17641	
Per capita /na,c (in dollars)	161	171	174	
Manufacturing share /na,c (%)	9.5	9.8	9.2	
MANUFACTURING:				
Value added /na,c (in million dollars)	1177	1479	1622	
Value added (in million dollars)	392	834	782	
Industrial production index	100	132	135	
Gross output (in million dollars)	986	2253	2474	/e
Employment (in thousands)	357	411	499	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	60	63	68	/e
Wages and salaries (%)	13	12	11	/e
Operating surplus (%)	27	25	21	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	2764	5478	4961	/e
Value added / worker	1097	2028	1568	/e
Average wage	358	635	539	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	6.38	/e 1.46	/e 2.63	/e
in percentage of θ in 1970-1975	226	/e 52	/e 93	/e
Growth rate / structural change	1.13	/e 4.56	/e 0.71	/e
Degree of specialization	35.2	/e 34.0	/e 33.4	/e
-VALUE ADDED: (in million dollars)				
311 Food products	45	78	89	/e
313 Beverages	4	7	8	/e
314 Tobacco products	82	111	93	/e
321 Textiles	139	336	238	/e
322 Wearing apparel	-	-	2	/e
323 Leather and fur products	4	18	11	/e
324 Footwear	1	4	5	/e
331 Wood and wood products	-	3	4	/e
332 Furniture and fixtures	-	1	2	/e
341 Paper and paper products	7	23	22	/e
342 Printing and publishing	3	6	8	/e
351 Industrial chemicals	20	33	45	/e
352 Other chemical products	32	97	107	/e
353 Petroleum refineries	1	2	3	/e
354 Miscellaneous petroleum and coal products	-	1	1	/e
355 Rubber products	3	4	5	/e
356 Plastic products	-	-	1	/e
361 Pottery, china and earthenware	1	2	3	/e
362 Glass and glass products	2	4	4	/e
369 Other non-metal mineral products	4	14	13	/e
371 Iron and steel	23	39	69	/e
372 Non-ferrous metals	-	-	-	/e
381 Metal products	6	9	11	/e
382 Non-electrical machinery	2	4	11	/e
383 Electrical machinery	4	19	25	/e
384 Transport equipment	5	11	16	/e
385 Professional and scientific equipment	3	7	5	/e
390 Other manufacturing industries	-	1	1	/e

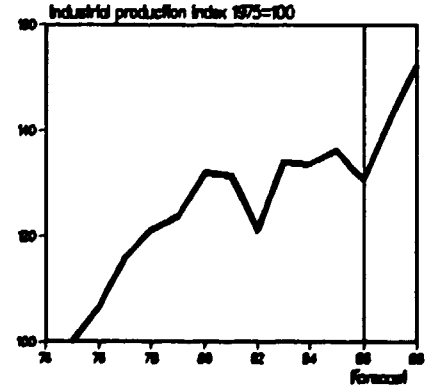
GDP per capita 1000$/c



Manufacturing share in GDP %/c

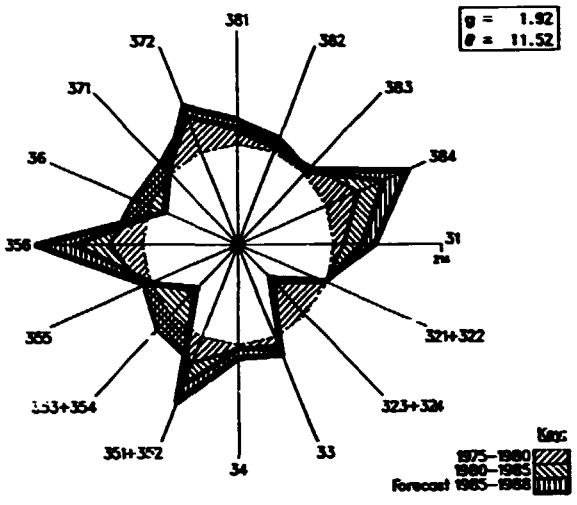


Industrial production index 1975=100

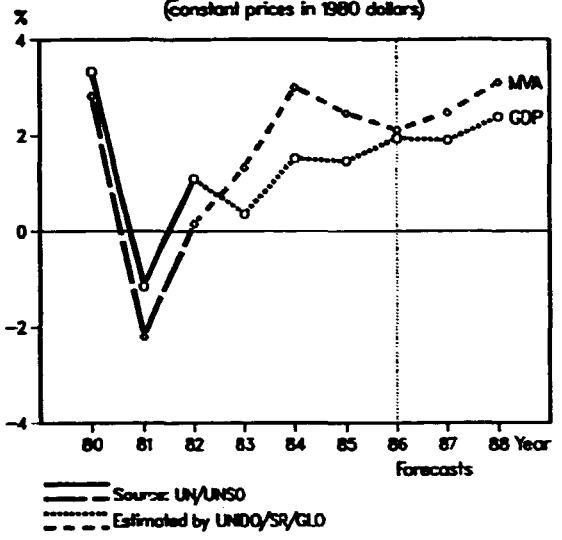


For source, footnotes and comments see "Technical notes" above.

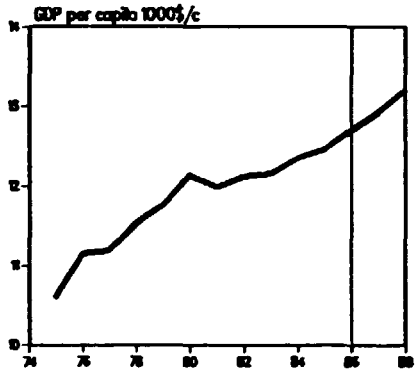
Industrial structural change
(index of value added: 1975=100)

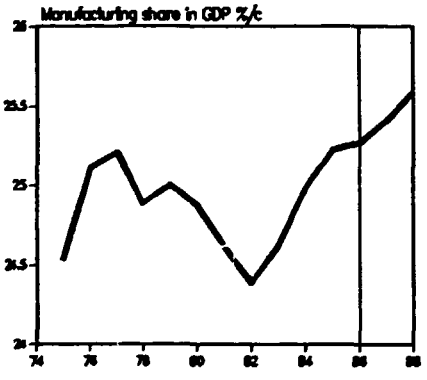


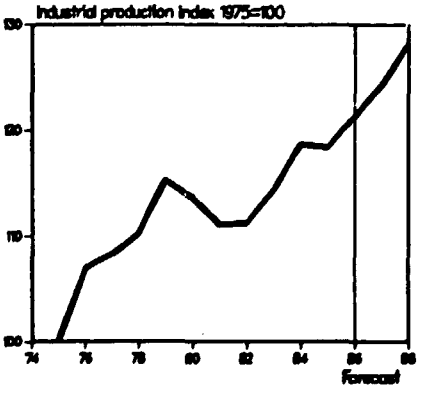
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	103786	119493	123437	
Per capita /na,c (in dollars)	10595	12129	12465	
Manufacturing share /na,c (%)	24.5	24.9	25.2	
MANUFACTURING:				
Value added /na,c (in million dollars)	25459	29731	31134	
Value added (in million dollars)	16141	27801	18931	
Industrial production index	100	114	118	
Gross output (in million dollars)	47517	82456	62421	/e
Employment (in thousands)	1033	868	741	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	66	66	70	/e
Wages and salaries (%)	17	17	14	/e
Operating surplus (%)	16	17	16	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	45999	94995	84196	/e
Value added / worker	15626	32029	25535	/e
Average wage	8037	16145	12107	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	5.52	2.24	2.93	
in percentage of θ in 1970-1975	162	66	86	
Growth rate / structural change	-1.30	-0.66	-0.07	
Degree of specialization	12.6	12.8	14.7	
-VALUE ADDED: (in million dollars)				
311 Food products	2261	3977	2993	
313 Beverages	392	547	389	
314 Tobacco products	122	198	130	
321 Textiles	881	1446	1037	
322 Wearing apparel	587	660	383	
323 Leather and fur products	65	109	72	/e
324 Footwear	54	65	37	
331 Wood and wood products	80	140	86	/e
332 Furniture and fixtures	668	1163	707	/e
341 Paper and paper products	363	612	445	
342 Printing and publishing	589	927	554	/e
351 Industrial chemicals	1255	2401	1985	/e
352 Other chemical products	287	663	515	/e
353 Petroleum refineries	111	504	201	
354 Miscellaneous petroleum and coal products	25	77	37	/e
355 Rubber products	122	191	141	/e
356 Plastic products	342	814	648	/e
361 Pottery, china and earthenware	67	117	54	/e
362 Glass and glass products	254	441	188	
369 Other non-metal mineral products	412	717	359	/e
371 Iron and steel	1318	2048	1241	
372 Non-ferrous metals	285	489	368	
381 Metal products	1240	2079	1404	
382 Non-electrical machinery	1464	2466	1717	/e
383 Electrical machinery	1379	2312	1434	
384 Transport equipment	1173	1883	1183	
385 Professional and scientific equipment	117	196	137	/e
390 Other manufacturing industries	277	568	386	/e

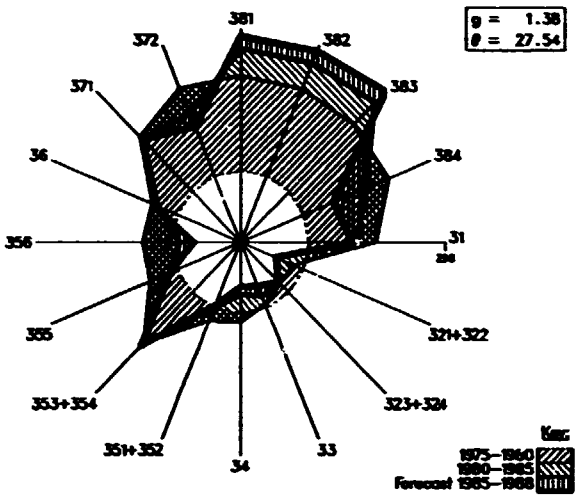




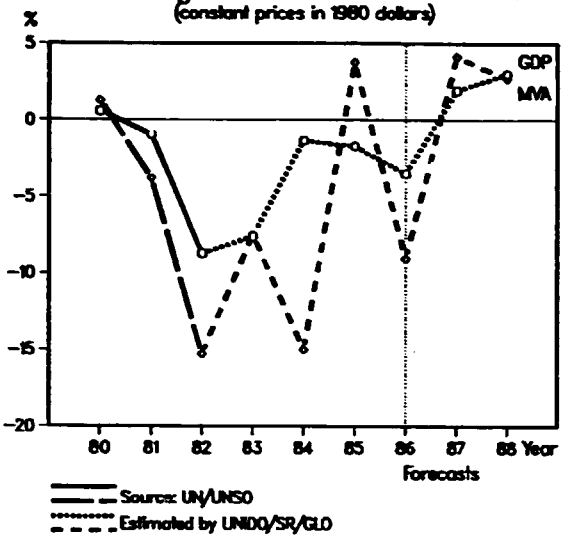


For source, footnotes and comments see "Technical notes" above.

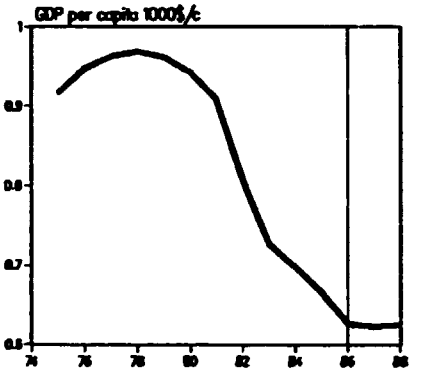
Industrial structural change
(index of value added: 1975=100)

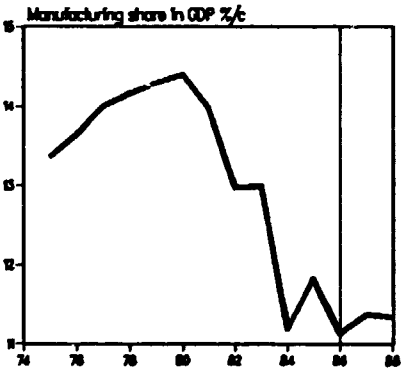


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



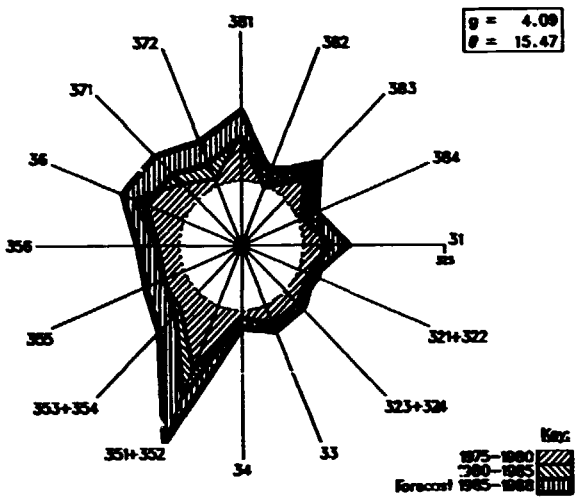
	1975	1980	1985	
GDP: /na,c (in million dollars)	4484	5247	4250	
Per capita /na,c (in dollars)	916	942	667	
Manufacturing share /na,c (%)	13.4	14.4	11.8	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	599	756	502	/e
Value added (in million dollars)	330	755	...	
Industrial production index	100	141	123	
Gross output /in million dollars)	805	1852	...	
Employment (in thousands)	106	89	103	/e
-PROFITABILITY:(in percent of gross output)				
Intermediate input (%)	59	59	...	
Wages and salaries (%)	17	14	...	
Operating surplus (%)	24	27	...	
-PRODUCTIVITY:(in dollars)				
Gross output / worker	7602	20818	...	
Value added / worker	3117	8488	...	
Average wage	1312	2937	...	
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	4.04	4.11	1.63	
in percentage of θ in 1970-1975	78	79	31	
Growth rate / structural change	1.22	1.62	2.31	
Degree of specialization	21.7	25.2	24.9	
-VALUE ADDED:(in million dollars)				
311 Food products	102	217	...	
313 Beverages	17	43	...	
314 Tobacco products	6	21	...	
321 Textiles	24	32	...	
322 Wearing apparel	54	71	...	
323 Leather and fur products	2	2	...	
324 Footwear	10	13	...	
331 Wood and wood products	8	14	...	
332 Furniture and fixtures	9	15	...	
341 Paper and paper products	1	1	...	
342 Printing and publishing	6	9	...	
351 Industrial chemicals	1	7	...	
352 Other chemical products	8	27	...	
353 Petroleum refineries	36	129	...	
354 Miscellaneous petroleum and coal products	-	7	...	
355 Rubber products	2	15	...	
356 Plastic products	3	12	...	
361 Pottery, china and earthenware	-	1	...	
362 Glass and glass products	3	7	...	
369 Other non-metal mineral products	11	32	...	
371 Iron and steel	-	2	...	
372 Non-ferrous metals	6	30	...	
381 Metal products	6	20	...	
382 Non-electrical machinery	2	8	...	
383 Electrical machinery	1	4	...	
384 Transport equipment	1	1	...	
385 Professional and scientific equipment	-	1	...	
390 Other manufacturing industries	10	12	...	



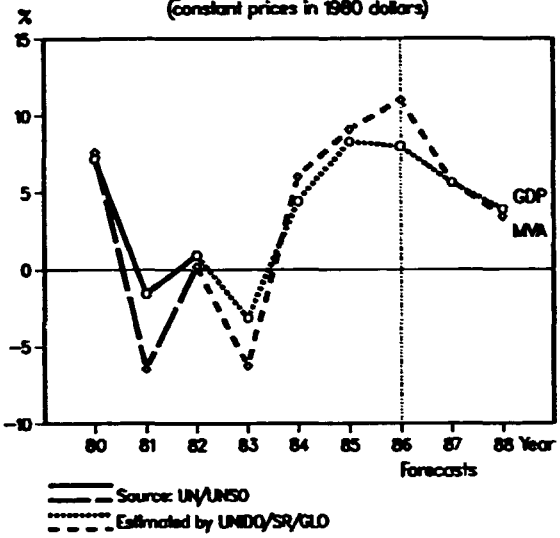


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

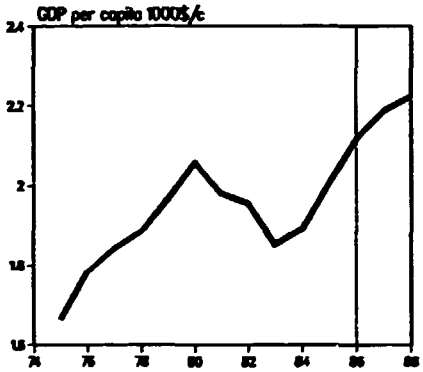


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

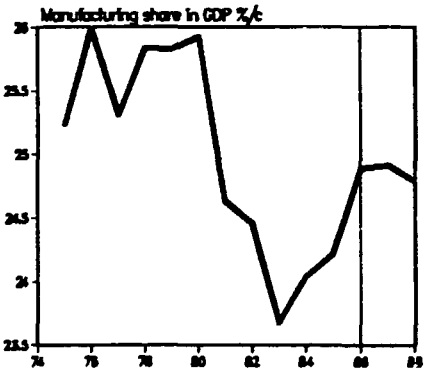


	1975	1980	1985	
GDP: /na,c (in million dollars)	179735	249725	271885	
Per capita /na,c (in dollars)	1664	2069	2004	
Manufacturing share /na,c (%)	25.2	25.9	24.2	
MANUFACTURING:				
Value added /na,c (in million dollars)	45338	64745	65785	
Value added (in million dollars)	35636	73252	60161	
Industrial production index	100	140	139	
Gross output (in million dollars)	90580	179870	176403	/e
Employment (in thousands)	3519	4727	5160	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	61	59	66	/e
Wages and salaries (%)	8	7	6	/e
Operating surplus (%)	32	34	28	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	25740	38052	33989	/e
Value added / worker	10127	15496	11658	/e
Average wage	1949	2654	2050	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	2.80	2.40	0.79	
in percentage of θ in 1970-1975	60	51	17	
Growth rate / structural change	1.82	4.00	9.99	
Degree of specialization	12.3	11.2	11.3	
-VALUE ADDED: (in million dollars)				
311 Food products	4171	8489	7170	/e
313 Beverages	664	1474	1220	/e
314 Tobacco products	394	510	443	/e
321 Textiles	2313	4386	3478	/e
322 Wearing apparel	1034	2842	2520	/e
323 Leather and fur products	197	347	314	/e
324 Footwear	381	1108	961	/e
331 Wood and wood products	1058	2006	1060	/e
332 Furniture and fixtures	726	1134	966	/e
341 Paper and paper products	947	2257	1915	/e
342 Printing and publishing	1378	1937	1666	/e
351 Industrial chemicals	1548	3494	2987	/e
352 Other chemical products	1427	3411	2827	/e
353 Petroleum refineries	1475	3953	3436	/e
354 Miscellaneous petroleum and coal products	156	387	336	/e
355 Rubber products	628	945	688	/e
356 Plastic products	849	1888	1686	/e
361 Pottery, china and earthenware	239	451	321	/e
362 Glass and glass products	327	560	447	/e
369 Other non-metal mineral products	1736	3324	2[illegible]3	/e
371 Iron and steel	2171	4179	3441	/e
372 Non-ferrous metals	570	1119	919	/e
381 Metal products	2009	3456	2828	/e
382 Non-electrical machinery	3888	7474	6443	/e
383 Electrical machinery	2166	4739	4027	/e
384 Transport equipment	2387	5638	4842	/e
385 Professional and scientific equipment	238	510	271	/e
390 Other manufacturing industries	560	1233	653	/e

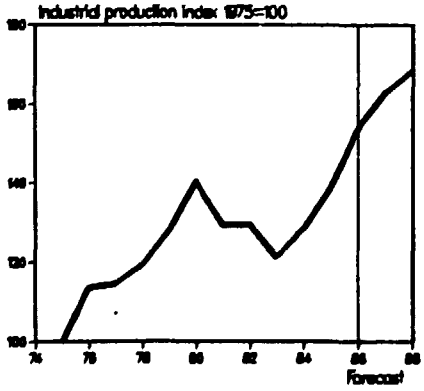
GDP per capita 1000$/c



Manufacturing share in GDP %/c

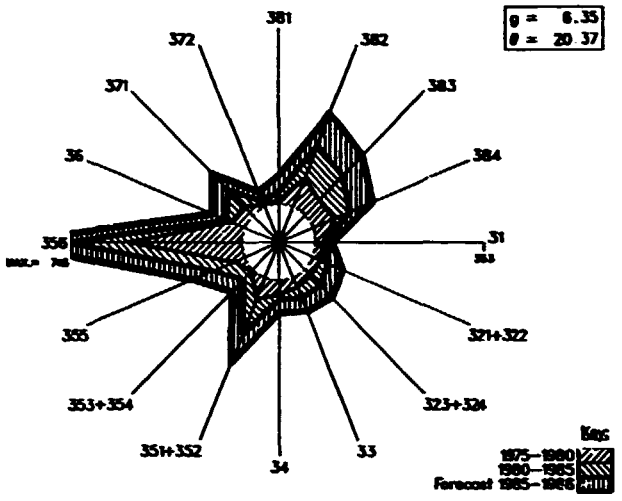


Industrial production index 1975=100

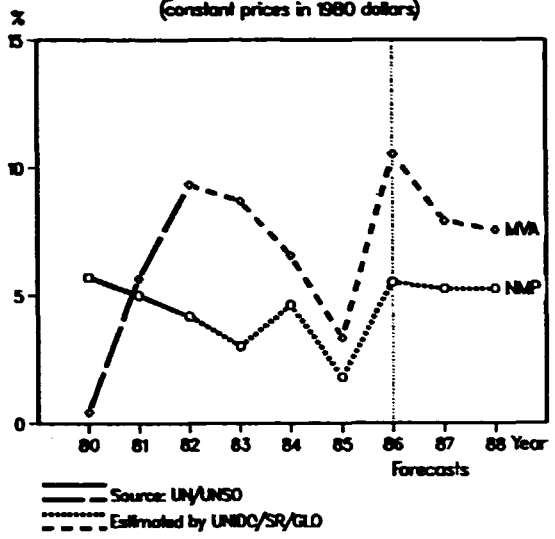


For source, footnotes and comments see "Technical notes" above.

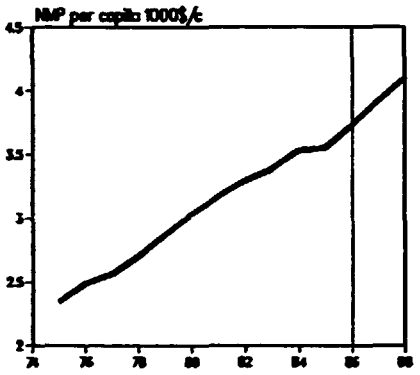
Industrial structural change
(index of value added: 1975=100)

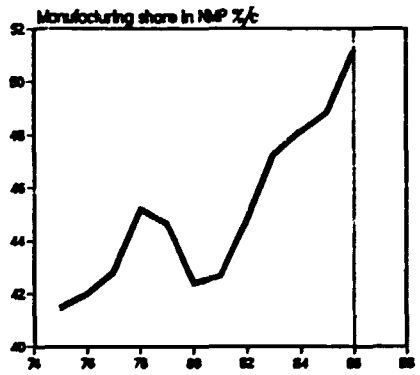


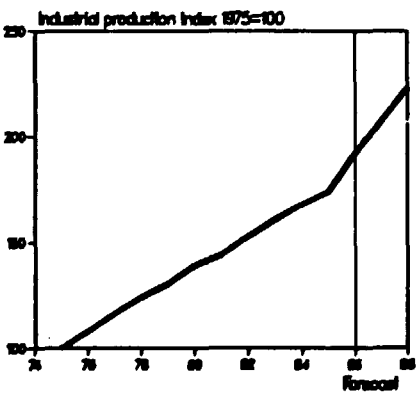
Annual growth rates of NMP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
NMP: /na,c (in million dollars)	20454	26849	32225
Per capita /na,c (in dollars)	2346	3030	3552
Manufacturing share /na,c (%)	41.5	42.4	48.8
MANUFACTURING:			
Value added /na,c (in million dollars)	8483	11384	15738
Value added (in million dollars)	...	...	...
Industrial production index	100	139	174
Gross output (in million dollars)	...	...	...
Employment (in thousands)	1197	1260	1304 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	...	...	...
Wages and salaries (%)	...	...	...
Operating surplus (%)	...	...	...
-PRODUCTIVITY: (in dollars)			
Gross output / worker	...	...	...
Value added / worker	...	...	...
Average wage	1468 /e	2629 /e	2582 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	2.61 /e	7.84 /e	1.97 /e
in percentage of θ in 1970-1975	79 /e	238 /e	60 /e
Growth rate / structural change	3.91 /e	0.87 /e	1.75 /e
Degree of specialization	11.4 /e	11.4 /e	11.2 /e
-VALUE ADDED: (in million dollars)			
311 Food products	...	...	...
313 Beverages	...	...	...
314 Tobacco products	...	...	...
321 Textiles	...	...	...
322 Wearing apparel	...	...	...
323 Leather and fur products	...	...	...
324 Footwear	...	...	...
331 Wood and wood products	...	...	...
332 Furniture and fixtures	...	...	...
341 Paper and paper products	...	...	...
342 Printing and publishing	...	...	...
351 Industrial chemicals	...	...	...
352 Other chemical products	...	...	...
353 Petroleum refineries	...	...	...
354 Miscellaneous petroleum and coal products	...	...	...
355 Rubber products	...	...	...
356 Plastic products	...	...	...
361 Pottery, china and earthenware	...	...	...
362 Glass and glass products	...	...	...
369 Other non-metal mineral products	...	...	...
371 Iron and steel	...	...	...
372 Non-ferrous metals	...	...	...
381 Metal products	...	...	...
382 Non-electrical machinery	...	...	...
383 Electrical machinery	...	...	...
384 Transport equipment	...	...	...
385 Professional and scientific equipment	...	...	...
390 Other manufacturing industries	...	...	...

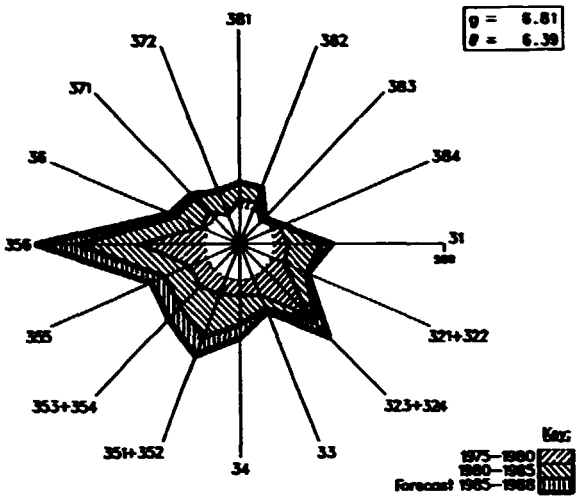




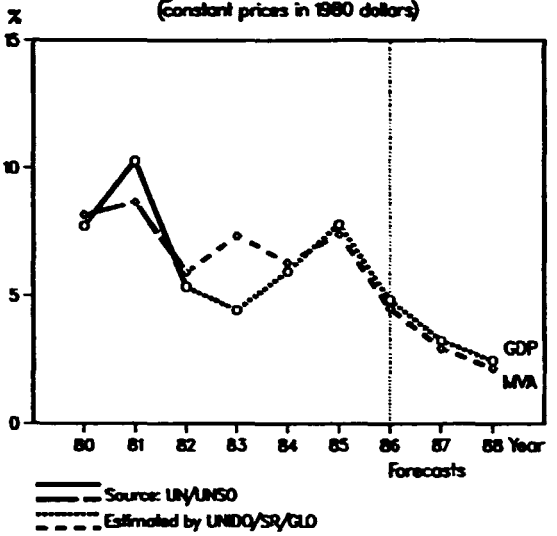


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

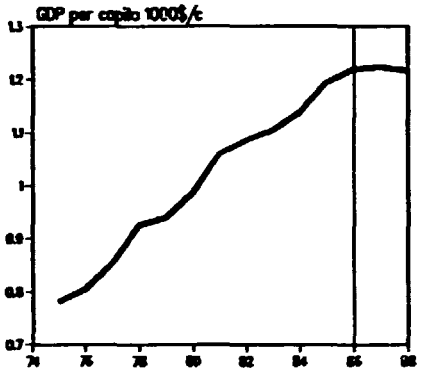


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

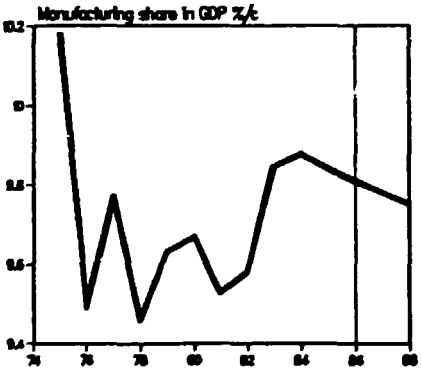


	1975	1980	1985
GDP: /na,c (in million dollars)	5920	8603	11784
Per capita /na,c (in dollars)	781	986	1194
Manufacturing share /na,c (%)	10.2	9.7	9.8 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	603	822	1160 /e
Value added (in million dollars)	195	432 /e	460 /e
Industrial production index	100	137	214
Gross output (in million dollars)	509	956 /e	870 /e
Employment (in thousands)	29	29 /e	29 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	62	55 /e	48 /e
Wages and salaries (%)	15	16 /e	16 /e
Operating surplus (%)	24	29 /e	36 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	17596	32896 /e	29889 /e
Value added / worker	6754	14871 /e	15462 /e
Average wage	2608	5274 /e	4711 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	9.11 /e	10.18 /e	0.83 /e
in percentage of θ in 1970-1975	103 /e	115 /e	9 /e
Growth rate / structural change	0.17 /e	0.40 /e	8.91 /e
Degree of specialization	17.2 /e	17.3 /e	20.1 /e
-VALUE ADDED: (in million dollars)			
311 Food products	16	47 /e	54 /e
313 Beverages	49	182 /e	218 /e
314 Tobacco products	21	21 /e	11 /e
321 Textiles	22	22 /e	17 /e
322 Wearing apparel	6	7 /e	4 /e
323 Leather and fur products	2	7 /e	7 /e
324 Footwear	8	8 /e	5 /e
331 Wood and wood products	2	4 /e	4 /e
332 Furniture and fixtures	-	1 /e	1 /e
341 Paper and paper products	1	5 /e	6 /e
342 Printing and publishing	2	5 /e	5 /e
351 Industrial chemicals	3	7 /e	8 /e
352 Other chemical products	15	8 /e	4 /e
353 Petroleum refineries	-	- /e	- /e
354 Miscellaneous petroleum and coal products	-	2 /e	2 /e
355 Rubber products	-	2 /e	3 /e
356 Plastic products	4	14 /e	14 /e
361 Pottery, china and earthenware	3	5 /e	4 /e
362 Glass and glass products	2	4 /e	2 /e
369 Other non-metal mineral products	6	10 /e	9 /e
371 Iron and steel	4	20 /e	26 /e
372 Non-ferrous metals	9	15 /e	15 /e
381 Metal products	1	- /e	- /e
382 Non-electrical machinery	12	17 /e	11 /e
383 Electrical machinery	3	4 /e	2 /e
384 Transport equipment	1	3 /e	3 /e
385 Professional and scientific equipment	-	- /e	- /e
390 Other manufacturing industries	1	13 /e	16 /e

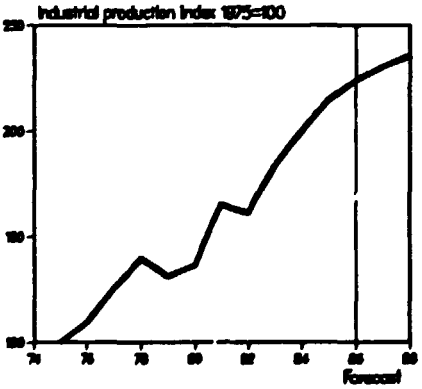
GDP per capita 1000$/c



Manufacturing share in GDP %/c

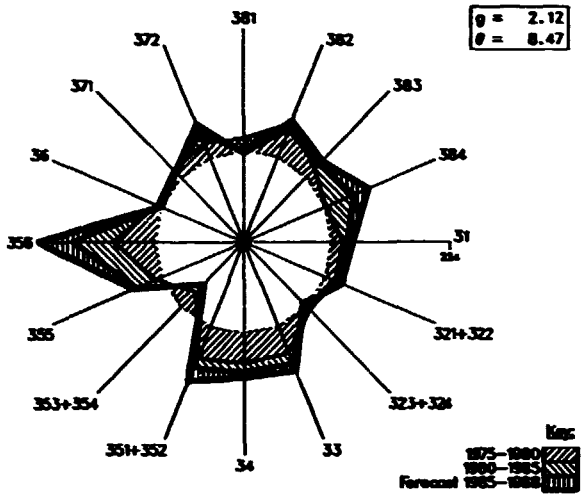


Industrial production index 1975=100

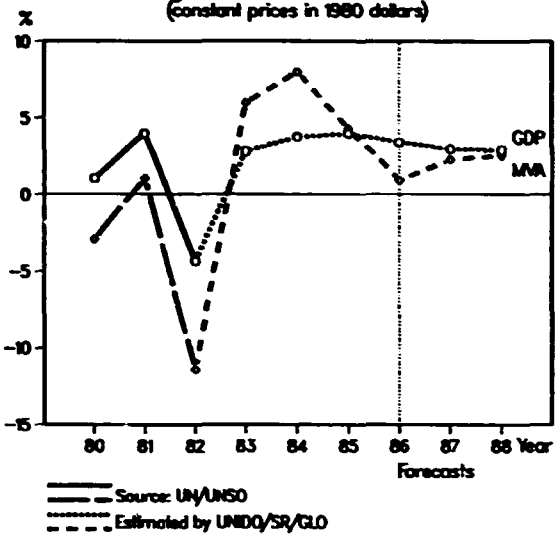


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

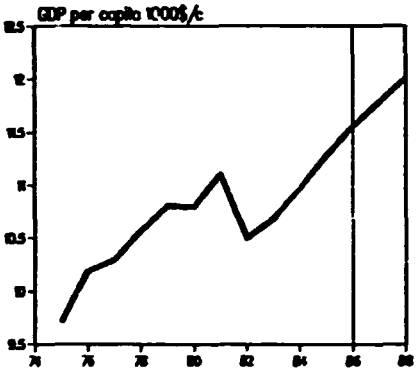


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

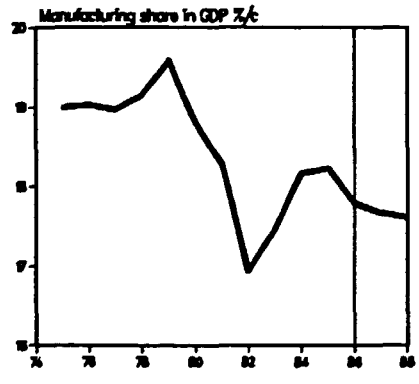


	1975	1980	1985	
GDP: /na,c (in million dollars)	220721	259997	286787	
Per capita /na,c (in dollars)	9712	10793	11279	
Manufacturing share /na,c (%)	19.0	18.8	18.2	
MANUFACTURING:				
Value added /na,c (in million dollars)	41932	48919	52278	
Value added (in million dollars)	38043	59803	72578	/e
Industrial production index	100	118	124	
Gross output (in million dollars)	101189	167211	199865	/e
Employment (in thousands)	1743	1853	1883	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	62	64	64	/e
Wages and salaries (%)	19	17	17	/e
Operating surplus (%)	19	19	19	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	58055	90238	106163	/e
Value added / worker	21825	32274	38651	/e
Average wage	10806	15296	18093	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	5.11	4.95	1.12	
in percentage of θ in 1970-1975	162	157	36	
Growth rate / structural change	-1.31	-0.44	3.95	
Degree of specialization	10.4	10.8	11.4	
-VALUE ADDED: (in million dollars)				
311 Food products	4061	5142	7478	
313 Beverages	1200	1660	2097	
314 Tobacco products	364	479	566	
321 Textiles	1436	2130	2557	
322 Wearing apparel	1141	1684	1919	
323 Leather and fur products	108	154	131	
324 Footwear	197	299	374	
331 Wood and wood products	1862	2958	2890	/e
332 Furniture and fixtures	706	1044	1061	/e
341 Paper and paper products	3363	5714	6881	/e
342 Printing and publishing	1868	3054	4226	
351 Industrial chemicals	1121	2164	2464	
352 Other chemical products	1496	2421	3626	/e
353 Petroleum refineries	805	1531	1825	/e
354 Miscellaneous petroleum and coal products	96	111	100	/e
355 Rubber products	560	873	1164	/e
356 Plastic products	452	873	1192	/e
361 Pottery, china and earthenware	39	43	36	/e
362 Glass and glass products	256	386	536	
369 Other non-metal mineral products	1180	1497	1739	/e
371 Iron and steel	1740	2852	2875	
372 Non-ferrous metals	1160	2190	2251	
381 Metal products	3029	4414	4683	
382 Non-electrical machinery	2212	3952	4365	
383 Electrical machinery	2645	3849	5025	
384 Transport equipment	4140	5911	9556	
385 Professional and scientific equipment	403	667	861	/e
390 Other manufacturing industries	600	932	1131	/e

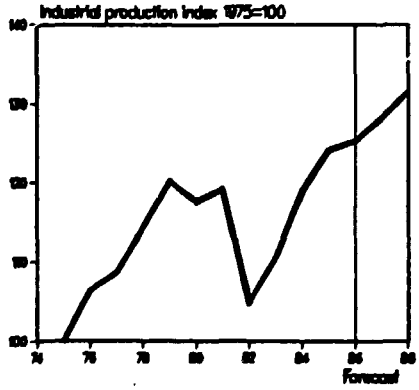
GDP per capita 1000$/c



Manufacturing share in GDP %/c

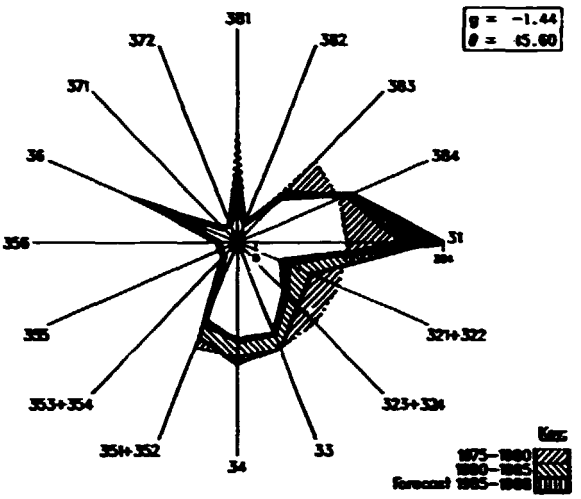


Industrial production index 1975=100

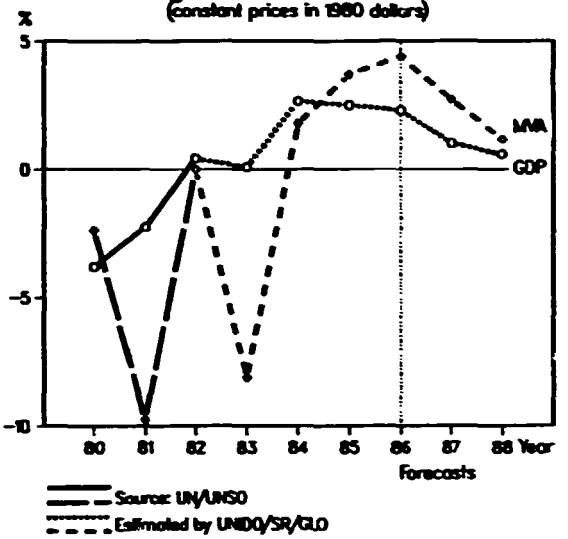


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

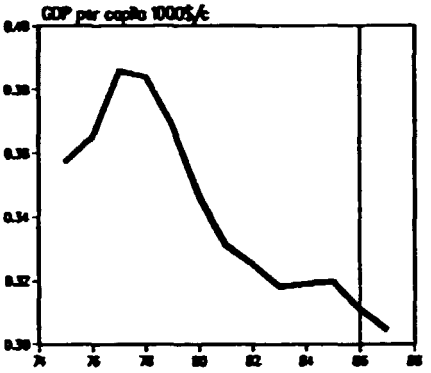


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

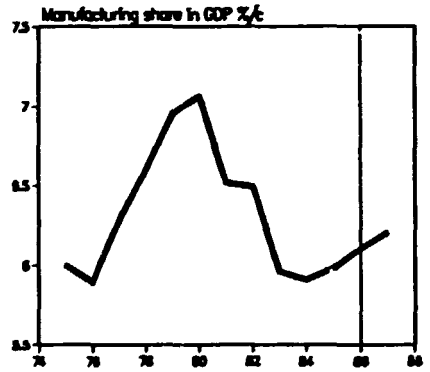


	1975	1980	1985
GDP: /na,c (in million dollars)	735	797	823
Per capita /na,c (in dollars)	357	347	320
Manufacturing share /na,c (%)	6.0	7.1	6.0 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	44	56	49 /e
Value added (in million dollars)	23	24	16 /e
Industrial production index	100	103	76
Gross output (in million dollars)	62	69	53 /e
Employment (in thousands)	5	3	4 /e
-PROFITABILITY:(in percent of gross output)			
Intermediate input (%)	63 /e	65 /e	70 /e
Wages and salaries (%)	12 /e	16 /e	16 /e
Operating surplus (%)	26 /e	18 /e	14 /e
-PRODUCTIVITY:(in dollars)			
Gross output / worker	11696 /e	20917 /e	14425 /e
Value added / worker	4364 /e	7239 /e	4367 /e
Average wage	1371 /e	3380 /e	2315 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	3.94 /e	8.49 /e	4.24 /e
in percentage of θ in 1970-1975	94 /e	203 /e	101 /e
Growth rate / structural change	-3.02 /e	0.66 /e	0.87 /e
Degree of specialization	30.8 /e	29.0 /e	27.3 /e
-VALUE ADDED:(in million dollars)			
311 Food products	5	5	3 /e
313 Beverages	2	3	2 /e
314 Tobacco products	4	4	3 /e
321 Textiles	8	3	2 /e
322 Wearing apparel	1	1	1 /e
323 Leather and fur products	-	1	- /e
324 Footwear	-	-	- /e
331 Wood and wood products	-	-	- /e
332 Furniture and fixtures	-	-	- /e
341 Paper and paper products	-	-	- /e
342 Printing and publishing	-	1	1 /e
351 Industrial chemicals	-	1	1 /e
352 Other chemical products	1	2	1 /e
353 Petroleum refineries	-	-	- /e
354 Miscellaneous petroleum and coal products	-	-	- /e
355 Rubber products	-	-	- /e
356 Plastic products	-	-	- /e
361 Pottery, china and earthenware	-	-	- /e
362 Glass and glass products	-	-	- /e
369 Other non-metal mineral products	-	-	- /e
371 Iron and steel	-	-	- /e
372 Non-ferrous metals	-	-	- /e
381 Metal products	1 /e	1 /e	1 /e
382 Non-electrical machinery	- /e	- /e	- /e
383 Electrical machinery	- /e	- /e	- /e
384 Transport equipment	- /e	1 /e	- /e
385 Professional and scientific equipment	-	-	- /e
390 Other manufacturing industries	-	-	2 /e

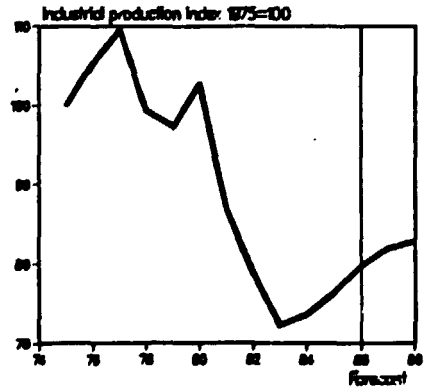
GDP per capita 1000$/c



Manufacturing share in GDP %/c

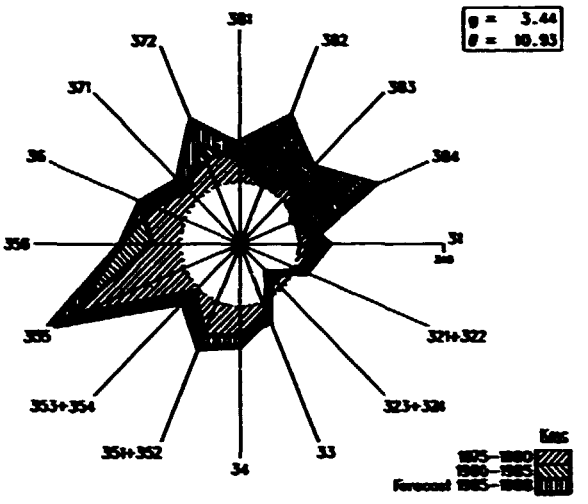


Industrial production index 1975=100

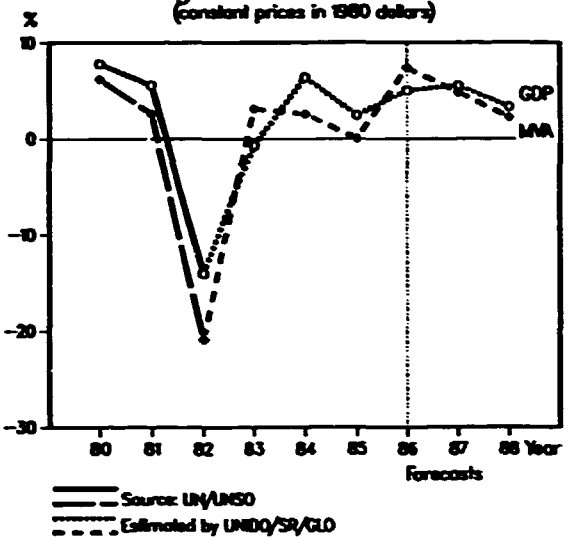


For source, footnotes and comments see "Technical notes" above.

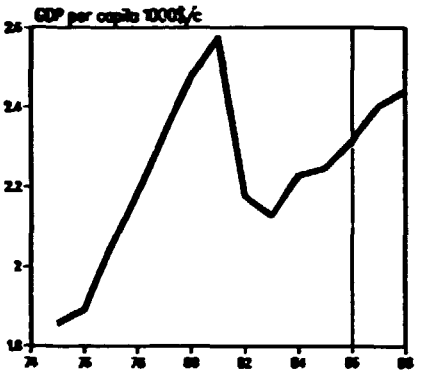
Industrial structural change
(Index of value added: 1975=100)

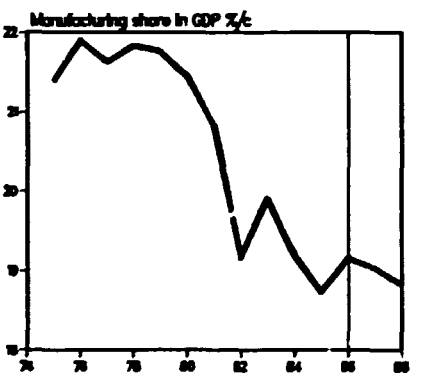


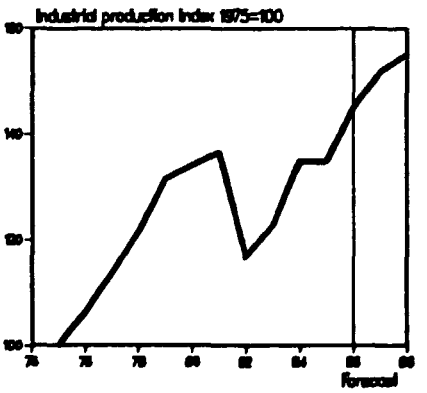
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	19185	27571	27040	
Per capita /na,c (in dollars)	1857	2478	2246	
Manufacturing share /na,c (%)	21.4	21.4	18.7	
MANUFACTURING:				
Value added /na,c (in million dollars)	4105	5911	5066	
Value added (in million dollars)	2944	5404	3880	
Industrial production index	100	134	136	
Gross output (in million dollars)	4927	13844	9060	/e
Employment (in thousands)	236	206	149	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	40	54	54	/e
Wages and salaries (%)	7	9	7	/e
Operating surplus (%)	52	38	39	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	20897	67057	60878	/e
Value added / worker	12488	31017	28261	/e
Average wage	1532	5702	4468	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	9.74	5.53	1.95	
in percentage of θ in 1970-1975	140	79	28	
Growth rate / structural change	-2.30	0.35	-0.00	
Degree of specialization	18.7	15.9	21.7	
-VALUE ADDED: (in million dollars)				
311 Food products	443	1062	786	/e
313 Beverages	110	371	179	/e
314 Tobacco products	89	274	230	/e
321 Textiles	156	300	162	/e
322 Wearing apparel	30	143	69	/e
323 Leather and fur products	19	29	14	/e
324 Footwear	41	99	37	/e
331 Wood and wood products	47	197	124	/e
332 Furniture and fixtures	11	47	18	/e
341 Paper and paper products	109	360	288	/e
342 Printing and publishing	61	234	97	/e
351 Industrial chemicals	88	70	65	/e
352 Other chemical products	149	416	283	/e
353 Petroleum refineries	271	236	258	/e
354 Miscellaneous petroleum and coal products	12	34	5	/e
355 Rubber products	26	76	49	/e
356 Plastic products	22	64	44	/e
361 Pottery, china and earthenware	16	18	8	/e
362 Glass and glass products	14	49	16	/e
369 Other non-metal mineral products	52	188	104	/e
371 Iron and steel	176	241	236	/e
372 Non-ferrous metals	552	1238	875	/e
381 Metal products	104	232	107	/e
382 Non-electrical machinery	84	123	75	/e
383 Electrical machinery	130	116	62	/e
384 Transport equipment	118	163	32	/e
385 Professional and scientific equipment	3	6	4	/e
390 Other manufacturing industries	11	17	3	/e

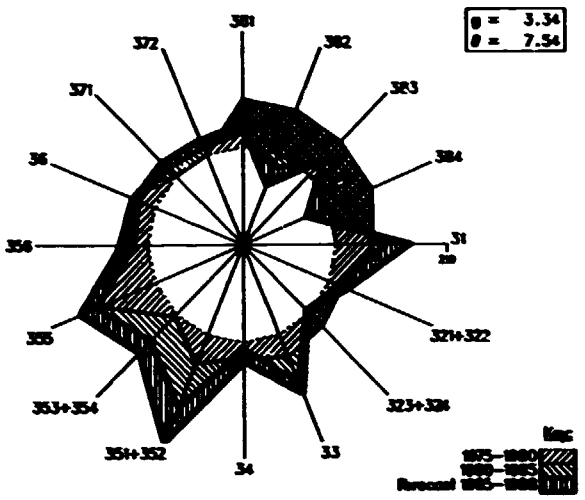




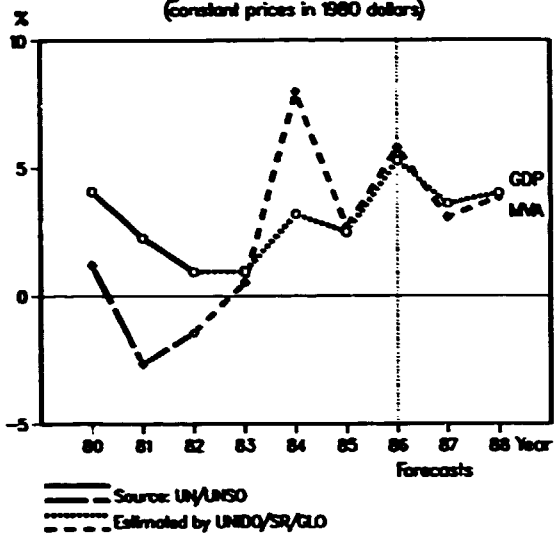


For source, footnotes and comments see "Technical notes" above.

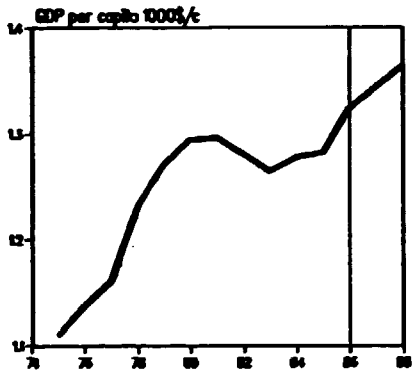
Industrial structural change
(index of value added: 1975=100)

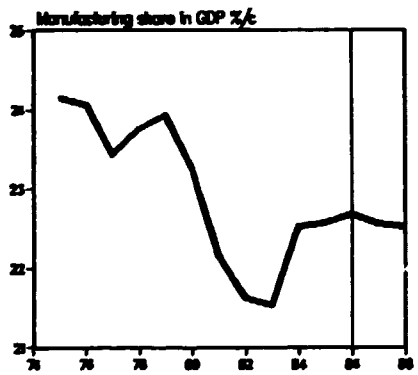


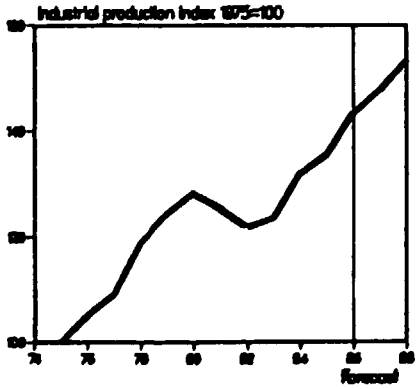
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	25731	33395	36822
Per capita /na,c (in doll rs)	1110	1295	1282
Manufacturing share /na,c (%)	24.1	23.3	22.6
MANUFACTURING:			
Value added /na,c (in million dollars)	6213	7771	8313
Value added (in million dollars)	2546	7131	6086 /e
Industrial production index	100	128	135
Gross output (in million dollars)	8551	16453	14742 /e
Employment (in thousands)	450	508	450
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	60	57	59 /e
Wages and salaries (%)	8	8	8 /e
Operating surplus (%)	32	35	33 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	14548	32374	32737 /e
Value added / worker	5875	14031	13538 /e
Average wage	1212	2583	2766 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	5.75	1.89	2.11
in percentage of θ in 1970-1975	100	61	68
Growth rate / structural change	0.40	1.72	1.28
Degree of specialization	19.3	19.9	21.5
-VALUE ADDED: (in million dollars)			
311 Food products	383	951	944 /e
313 Beverages	328	1021	955
314 Tobacco products	70	160	209
321 Textiles	328	803	562
322 Wearing apparel	77	241	180
323 Leather and fur products	21	59	41
324 Footwear	17	50	43
331 Wood and wood products	30	50	53
332 Furniture and fixtures	14	34	31
341 Paper and paper products	83	227	261
342 Printing and publishing	71	185	146
351 Industrial chemicals	148	303	397
352 Other chemical products	189	419	510
353 Petroleum refineries	126	773	100
354 Miscellaneous petroleum and coal products	4	17	23
355 Rubber products	53	117	109
356 Plastic products	35	141	116
361 Pottery, china and earthenware	14	44	42
362 Glass and glass products	28	76	88
369 Other non-metal mineral products	103	232	281
371 Iron and steel	75	217	166
372 Non-ferrous metals	11	34	28
381 Metal products	119	280	229
382 Non-electrical machinery	60	120	84
383 Electrical machinery	63	244	172
384 Transport equipment	147	256	211
385 Professional and scientific equipment	10	26	40
390 Other manufacturing industries	25	72	74

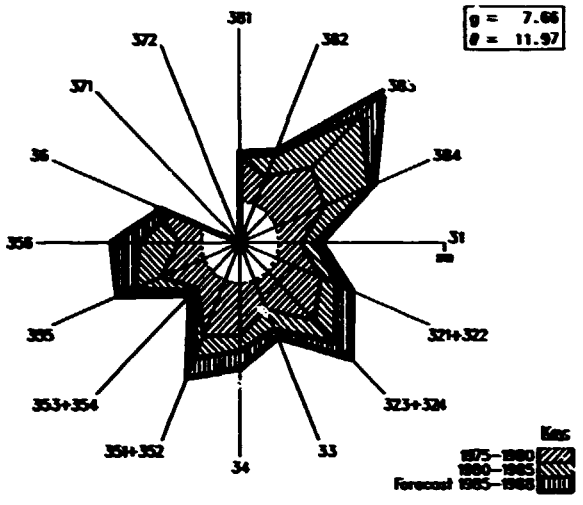




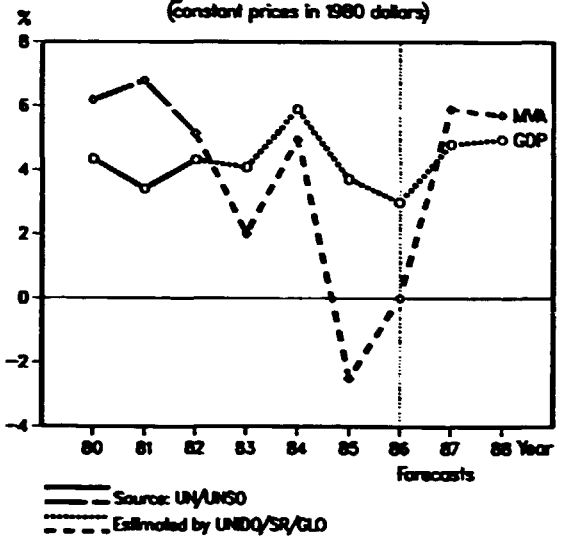


For source, footnotes and comments see "Technical notes" above.

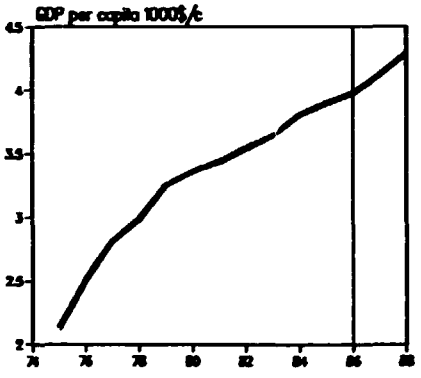
Industrial structural change
(index of value added: 1975=100)

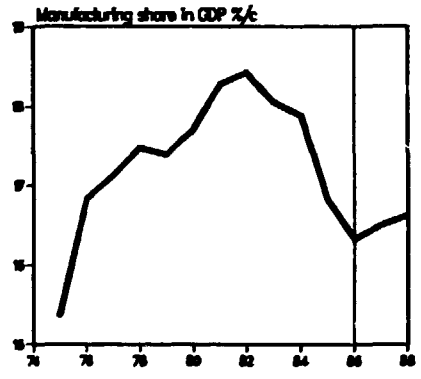


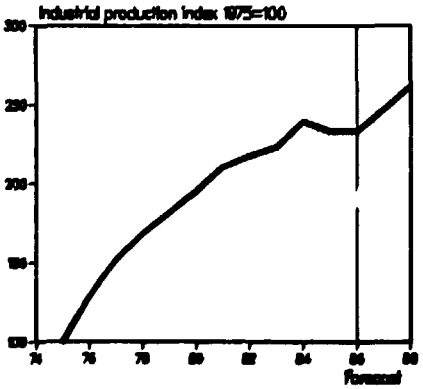
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	1298	2116	2611	
Per capita /na,c (in dollars)	2131	3363	3802	
Manufacturing share /na,c (%)	15.3	17.7	16.8	
MANUFACTURING:				
Value added /na,c (in million dollars)	199	376	439	
Value added (in million dollars)	99	374	360	
Industrial production index	100	195	233	
Gross output (in million dollars)	284	1102	1122	/e
Employment (in thousands)	18	34	43	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	65	66	68	/e
Wages and salaries (%)	13	14	15	/e
Operating surplus (%)	22	20	17	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	15661	32387	26352	/e
Value added / worker	5389	10984	8447	/e
Average wage	1953	4479	4082	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	13.93	2.27	1.44	
in percentage of θ in 1970-1975	206	34	21	
Growth rate / structural change	-0.67	3.38	-1.74	
Degree of specialization	12.8	12.2	11.8	
-VALUE ADDED: (in million dollars)				
311 Food products	15	42	45	/e
313 Beverages	13	28	24	/e
314 Tobacco products	3	13	9	/e
321 Textiles	5	16	18	/e
322 Wearing apparel	10	53	65	/e
323 Leather and fur products	1	5	6	/e
324 Footwear	5	21	20	/e
331 Wood and wood products	4	19	21	/e
332 Furniture and fixtures	4	17	20	/e
341 Paper and paper products	1	11	7	/e
342 Printing and publishing	5	15	16	/e
351 Industrial chemicals	-	3	2	/e
352 Other chemical products	3	11	13	/e
353 Petroleum refineries	5	6	4	/e
354 Miscellaneous petroleum and coal products	-	-	-	/e
355 Rubber products	1	3	1	/e
356 Plastic products	1	11	12	/e
361 Pottery, china and earthenware	-	-	-	/e
362 Glass and glass products	-	-	-	/e
369 Other non-metal mineral products	12	44	23	/e
371 Iron and steel	-	-	-	/e
372 Non-ferrous metals	-	-	-	/e
381 Metal products	5	23	24	/e
382 Non-electrical machinery	2	11	12	/e
383 Electrical machinery	-	5	5	/e
384 Transport equipment	1	5	4	/e
385 Professional and scientific equipment	-	-	-	/e
390 Other manufacturing industries	2	7	6	/e

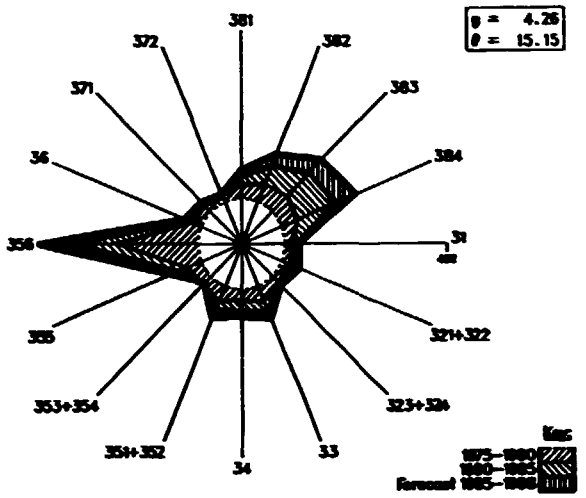




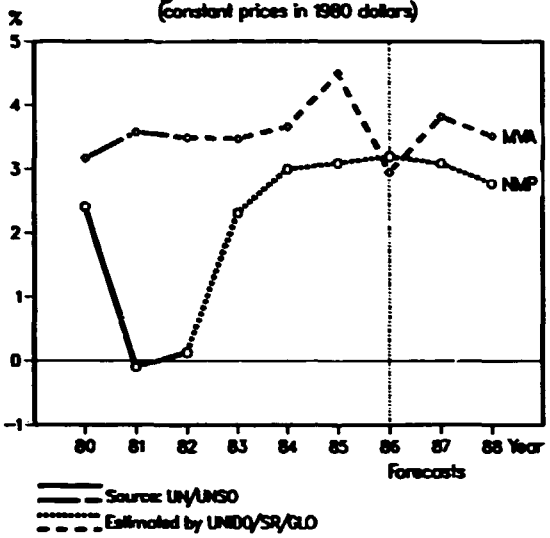


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

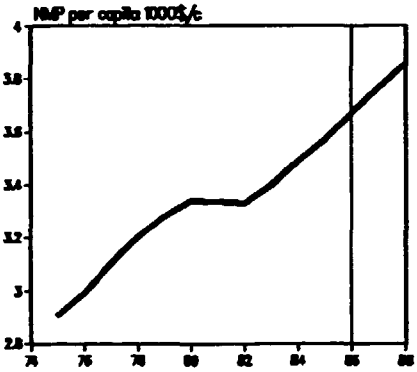


Annual growth rates of NMP and MVA
(constant prices in 1980 dollars)

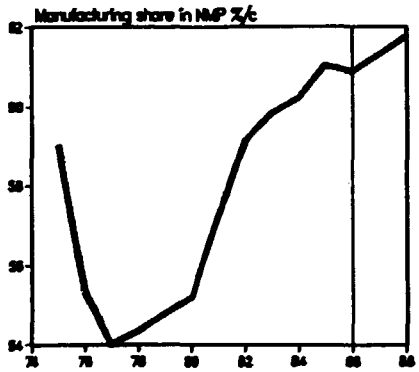


	1975	1980	1985
NMP: /na,c (in million dollars)	43017	51142	55585
Per capita /na,c (in dollars)	2906	3340	3568
Manufacturing share /na,c (%)	59.0	55.2	61.0
MANUFACTURING:			
Value added /na,c (in million dollars)	25395	28230	33928
Value added (in million dollars)	13628 /e	22411	19709
Industrial production index	100	128	155
Gross output (in million dollars)	40833 /e	53983	69056 /e
Employment (in thousands)	2465 /e	2518	2590
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	67 /e	58	71 /e
Wages and salaries (%)	14 /e	13	12 /e
Operating surplus (%)	19 /e	28	17 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	16565 /e	21439	26669 /e
Value added / worker	5488 /e	8900	7610 /e
Average wage	2334 /e	2889	3129 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	1.06 /e	0.70 /e	1.00 /e
in percentage of θ in 1970-'975	94 /e	62 /e	88 /e
Growth rate / structural change	6.82 /e	5.07 /e	4.49 /e
Degree of specialization	15.3 /e	16.0 /e	17.9 /e
-VALUE ADDED: (in million dollars)			
311 Food products	824	1639	1306 /e
313 Beverages	189	371	315 /e
314 Tobacco products	36	43	38 /e
321 Textiles	899	1433	1315 /e
322 Wearing apparel	258	363	376 /e
323 Leather and fur products	89	122	107 /e
324 Footwear	280	360	370 /e
331 Wood and wood products	322	505	422 /e
332 Furniture and fixtures	183	273	256 /e
341 Paper and paper products	232	509	442 /e
342 Printing and publishing	124	177	166 /e
351 Industrial chemicals	830	1644	1284 /e
352 Other chemical products	208	232	181 /e
353 Petroleum refineries	258	648	574 /e
354 Miscellaneous petroleum and coal products	29	166	136 /e
355 Rubber products	196	279	253 /e
356 Plastic products	37 /e	85	80 /e
361 Pottery, china and earthenware	26	59	63 /e
362 Glass and glass products	316	560	389 /e
369 Other non-metal mineral products	503	1007	760 /e
371 Iron and steel	1614	2286	1776 /e
372 Non-ferrous metals	305	426	309 /e
381 Metal products	476	1033	986 /e
382 Non-electrical machinery	2721	4499	4170 /e
383 Electrical machinery	802	1112	1258 /e
384 Transport equipment	1102	2186	2086 /e
385 Professional and scientific equipment	507	122	105 /e
390 Other manufacturing industries	161	291	210 /e

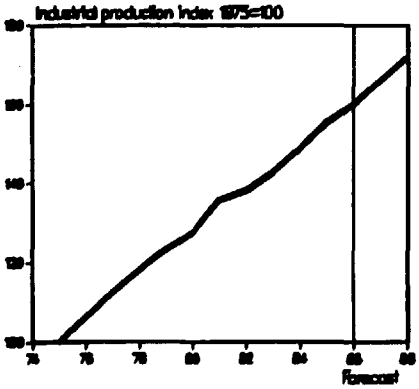
NMP per capita 1000$/c



Manufacturing share in NMP %/c

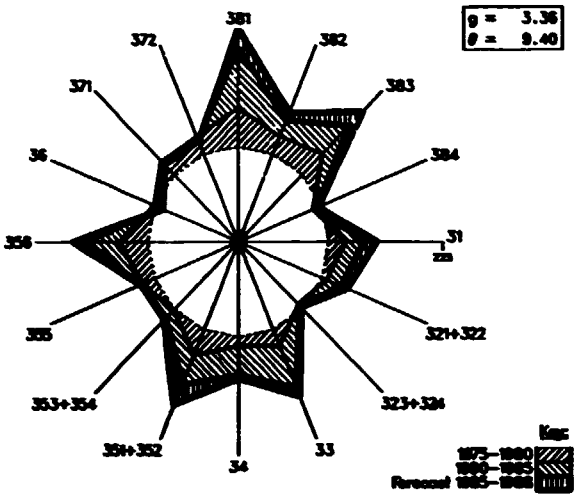


Industrial production index 1975=100

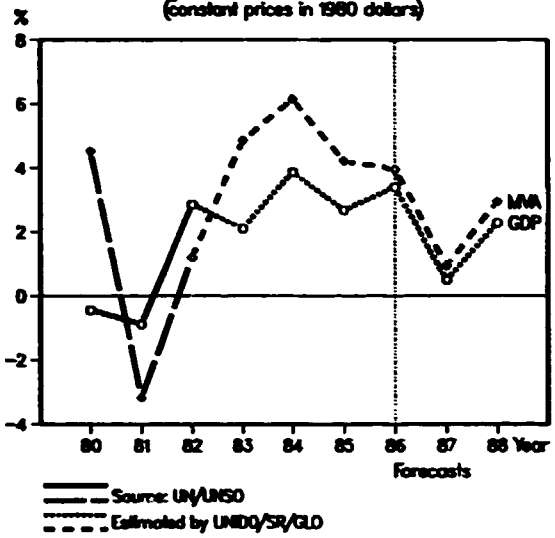


For source, footnotes and comments see "Technical notes" above.

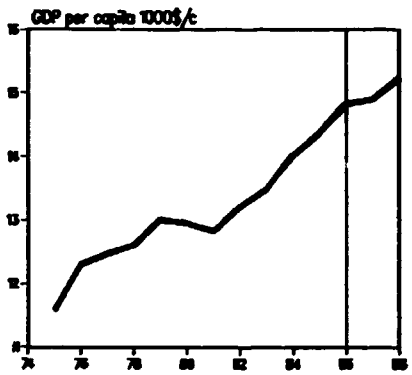
Industrial structural change
(index of value added: 1975=100)

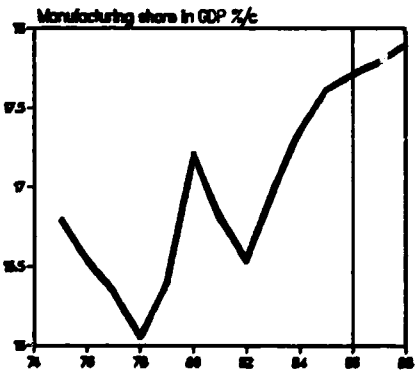


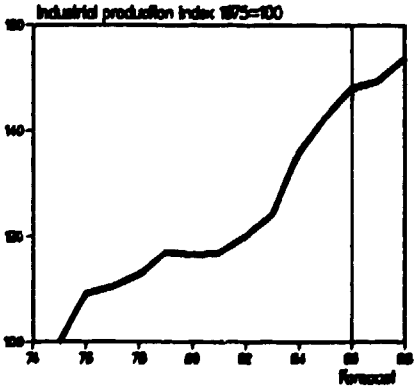
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	58694	66321	73616	
Per capita /na,c (in dollars)	11580	12946	14373	
Manufacturing share /na,c (%)	16.8	17.2	17.6	
MANUFACTURING:				
Value added /na,c (in million dollars)	9842	11411	12966	
Value added (in million dollars)	7184	12774	11110	
Industrial production index	100	117	142	
Gross output (in million dollars)	16759	31526	28220	/e
Employment (in thousands)	375	381	402	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	57	59	61	/e
Wages and salaries (%)	25	23	20	/e
Operating surplus (%)	18	18	19	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	44740	82745	70222	/e
Value added / worker	19179	33525	27647	/e
Average wage	11332	19040	14325	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.61	2.91	1.92	
in percentage of θ in 1970-1975	103	83	55	
Growth rate / structural change	-1.61	-0.07	2.60	
Degree of specialization	14.7	15.4	15.9	
-VALUE ADDED: (in million dollars)				
311 Food products	1154	2344	2080	
313 Beverages	322	490	388	
314 Tobacco products	63	109	90	
321 Textiles	310	423	354	
322 Wearing apparel	151	231	194	
323 Leather and fur products	24	30	20	
324 Footwear	31	62	43	
331 Wood and wood products	112	285	198	/e
332 Furniture and fixtures	169	330	337	/e
341 Paper and paper products	184	315	285	/e
342 Printing and publishing	535	941	781	
351 Industrial chemicals	227	561	522	
352 Other chemical products	357	586	[illegible]	/e
353 Petroleum refineries	40	65	47	
354 Miscellaneous petroleum and coal products	61	99	81	/e
355 Rubber products	48	79	62	/e
356 Plastic products	120	267	235	/e
361 Pottery, china and earthenware	52	87	45	/e
362 Glass and glass products	58	98	86	/e
369 Other non-metal mineral products	389	627	475	/e
371 Iron and steel	96	175	117	/e
372 Non-ferrous metals	26	71	46	/e
381 Metal products	457	912	907	
382 Non-electrical machinery	976	1718	1360	
383 Electrical machinery	412	712	667	
384 Transport equipment	547	653	675	
385 Professional and scientific equipment	134	284	308	/e
390 Other manufacturing industries	121	219	152	/e

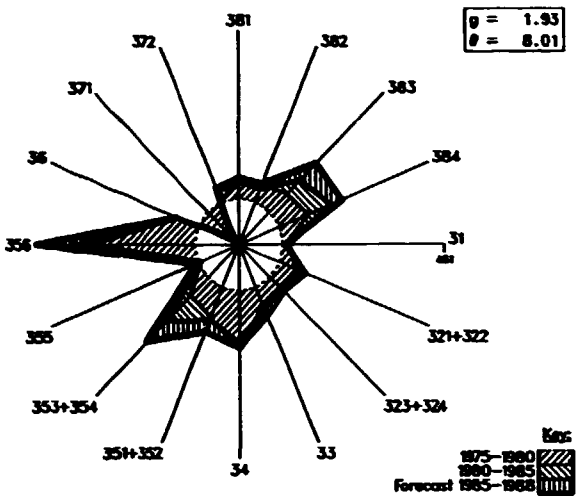




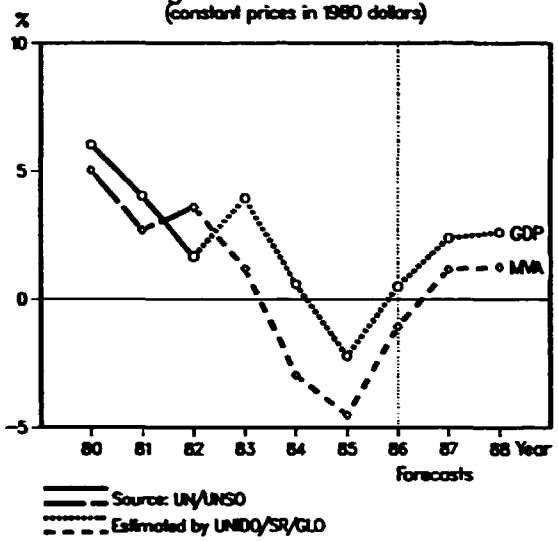


For source, footnotes and comments see "Technical notes" above.

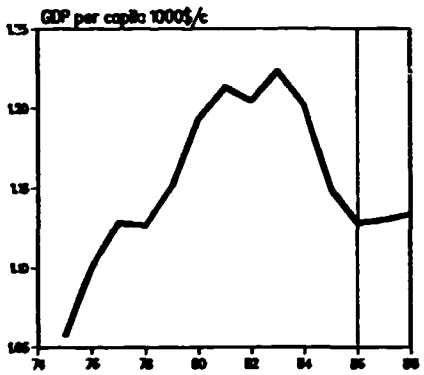
Industrial structural change
(index of value added: 1975=100)

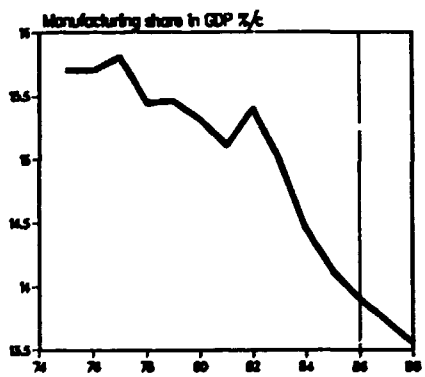


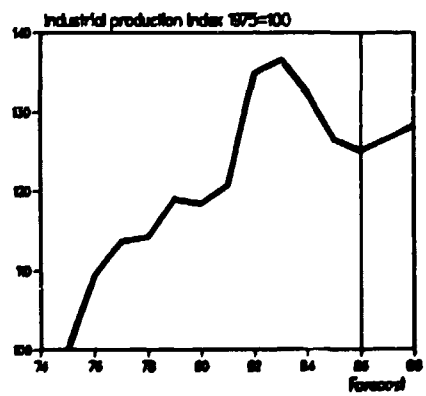
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	5226	6631	7174
Per capita /na,c (in dollars)	1057	1193	1149
Manufacturing share /na,c (%)	15.7	15.3	14.1 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	8[illegible]	1015	1013 /e
Value added (in million dollars)	736	1013	816 /e
Industrial production index	100	118	126
Gross output (in million dollars)	1743	2822	...
Employment (in thousands)	122	146	143 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	58	64	61 /e
Wages and salaries (%)	10	10	9 /e
Operating surplus (%)	32	26	31 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	14256	19339	14552 /e
Value added / worker	6012	6943	5704 /e
Average wage	1454	1867	1239 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	1.19 /e	2.81 /e	1.7[illegible] /e
in percentage of θ in 1970-1975	81 /e	191 /e	[illegible]21 /e
Growth rate / structural change	0.68 /e	-0.16 /e	-2.54 /e
Degree of specialization	49.9 /e	40.0 /e	41.1 /e
-VALUE ADDED: (in million dollars)			
311 Food products	455	610	30[illegible] /e
313 Beverages	71	103	121 /e
314 Tobacco products	34	50	49 /e
321 Textiles	12	29	30 /e
322 Wearing apparel	5	13	9 /e
323 Leather and fur products	6	11	8 /e
324 Footwear	4	13	15 /e
331 Wood and wood products	1	2	2 /e
332 Furniture and fixtures	4	11	13 /e
341 Paper and paper products	11	19	22 /e
342 Printing and publishing	8	14	12 /e
351 Industrial chemicals	13	18	14 /e
352 Other chemical products	21	41	27 /e
353 Petroleum refineries	15	66	76 /e
354 Miscellaneous petroleum and coal products	-	1	1 /e
355 Rubber products	4	7	7 /e
356 Plastic products	14	21	16 /e
361 Pottery, china and earthenware	-	2	1 /e
362 Glass and glass products	3	3	5 /e
369 Other non-metal mineral products	25	32	30 /e
371 Iron and steel	7	11	15 /e
372 Non-ferrous metals	-	1	1 /e
381 Metal products	14	21	28 /e
382 Non-electrical machinery	3	5	5 /e
383 Electrical machinery	4	7	7 /e
384 Transport equipment	-	-	- /e
385 Professional and scientific equipment	1	1	1 /e
390 Other manufacturing industries	1	2	2 /e

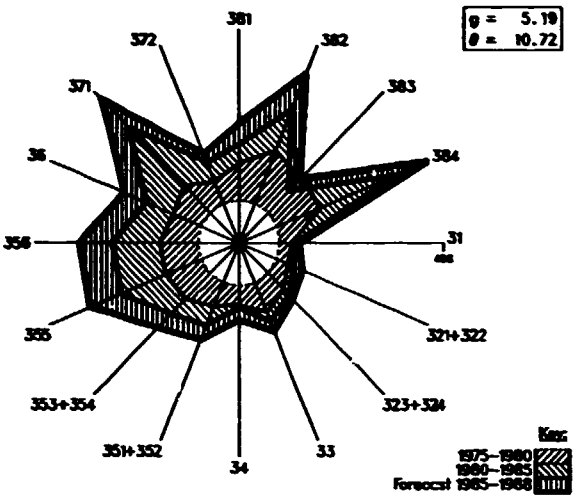




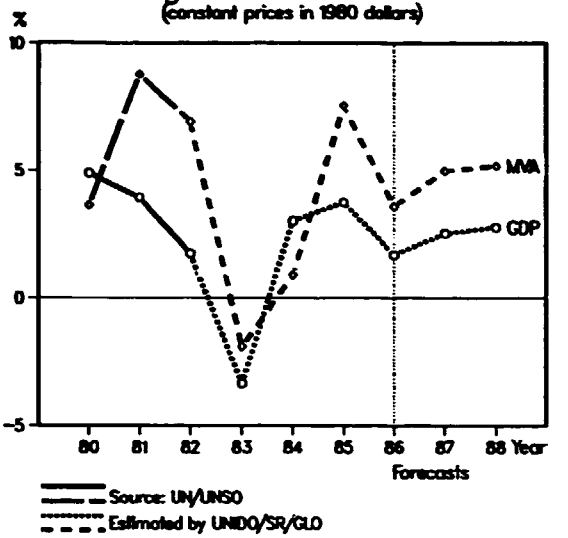


For source, footnotes and comments see "Technical notes" above.

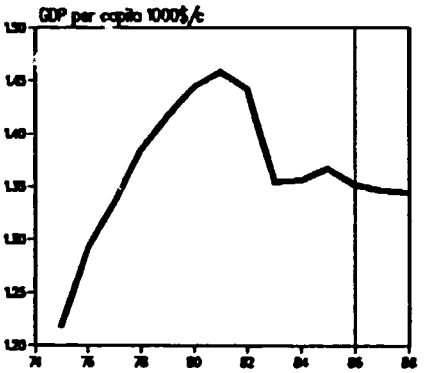
Industrial structural change
(index of value added: 1975=100)

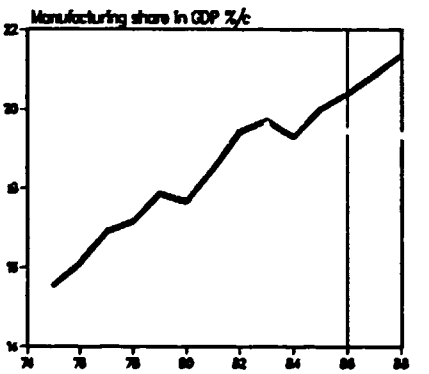


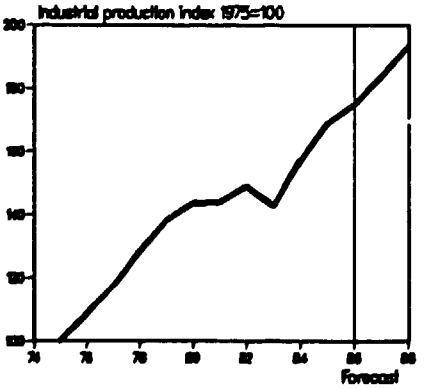
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	8564	11734	12824	
Per capita /na,c (in dollars)	1217	1444	1367	
Manufacturing share /na,c (%)	15.5	17.7	20.0	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	1330	2072	2565	/e
Value added (in million dollars)	415	1365	1264	/e
Industrial production index	100	144	169	
Gross output (in million dollars)	1112	3714	4304	/e
Employment (in thousands)	74	122	109	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	63	64	71	/e
Wages and salaries (%)	11	16	10	/e
Operating surplus (%)	26	21	19	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	15036	30489	39549	/e
Value added / worker	5615	11127	11522	/e
Average wage	1635	4859	4138	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	1.79	1.76	0.75	
in percentage of θ in 1970-1975	94	92	39	
Growth rate / structural change	2.50	2.27	10.02	
Degree of specialization	32.7	27.2	25.7	
-VALUE ADDED: (in million dollars)				
311 Food products	118	296	263	/e
313 Beverages	36	96	91	/e
314 Tobacco products	9	46	48	/e
321 Textiles	55	146	127	/e
322 Wearing apparel	5	47	22	/e
323 Leather and fur products	3	8	6	/e
324 Footwear	-	7	7	/e
331 Wood and wood products	12	38	34	/e
332 Furniture and fixtures	4	32	27	/e
341 Paper and paper products	13	42	24	/e
342 Printing and publishing	16	42	43	/e
351 Industrial chemicals	6	25	13	/e
352 Other chemical products	23	91	106	/e
353 Petroleum refineries	14	29	29	/e
354 Miscellaneous petroleum and coal products	1	4	11	/e
355 Rubber products	7	25	24	/e
356 Plastic products	14	34	50	/e
361 Pottery, china and earthenware	1	7	12	/e
362 Glass and glass products	2	10	8	/e
369 Other non-metal mineral products	20	101	80	/e
371 Iron and steel	5	25	32	/e
372 Non-ferrous metals	1	5	7	/e
381 Metal products	22	96	78	/e
382 Non-electrical machinery	1	4	7	/e
383 Electrical machinery	20	59	53	/e
384 Transport equipment	3	25	24	/e
385 Professional and scientific equipment	1	2	11	/e
390 Other manufacturing industries	4	14	8	/e

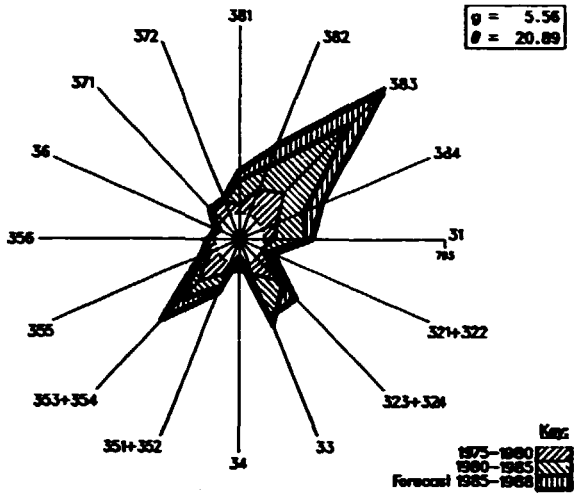




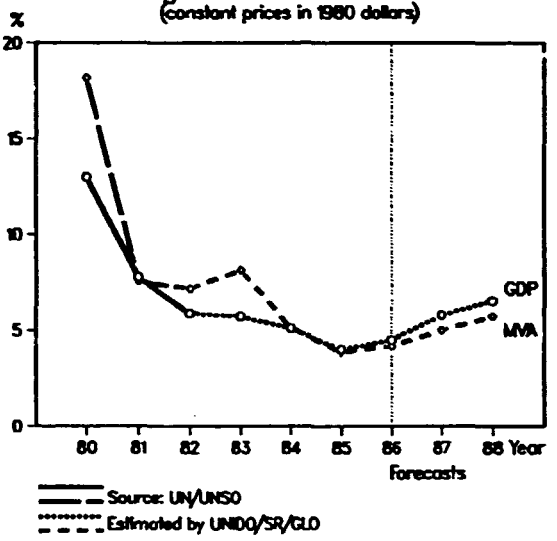


For source, footnotes and comments see "Technical notes" above.

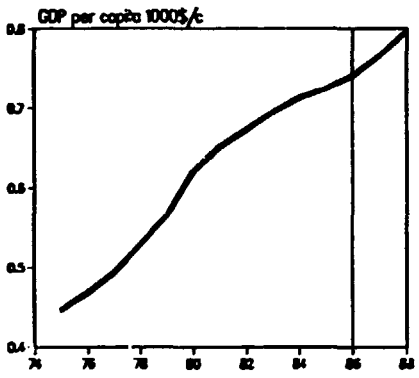
Industrial structural change
(index of value added: 1975=100)

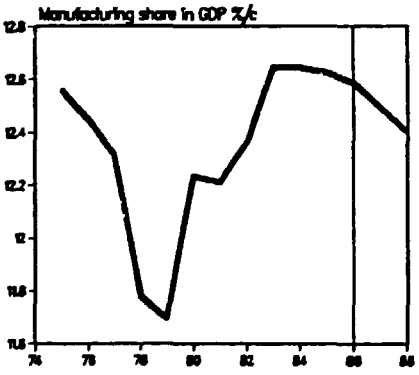


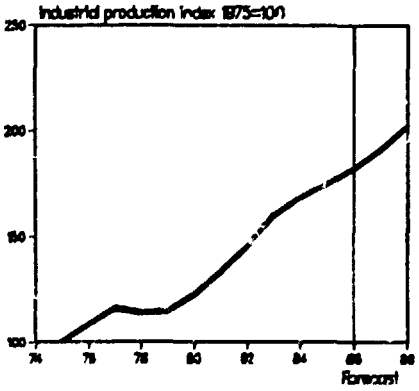
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	16172	25773	33991	/e
Per capita /na,c (in dollars)	445	621	725	/e
Manufacturing share /na,c (%)	12.6	12.2	12.6	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	2031	[illegible]	4292	/e
Value added (in million dollars)	1555	22[illegible]	5803	/e
Industrial production index	100	122	175	
Gross output (in million dollars)	5635	8866	22631	/e
Employment (in thousands)	731	868	1003	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	72	75	74	/e
Wages and salaries (%)	14	14	17	/e
Operating surplus (%)	14	11	9	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	7705	10206	22555	/e
Value added / worker	2125	2586	5784	/e
Average wage	1082	1474	3835	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.11	2.41	0.99	
in percentage of θ in 1970-1975	94	72	30	
Growth rate / structural change	4.17	2.95	3.91	
Degree of specialization	29.0	22.6	25.1	
-VALUE ADDED: (in million dollars)				
311 Food products	183	391	780	/e
313 Beverages	25	18	90	/e
314 Tobacco products	67	26	97	/e
321 Textiles	483	641	1520	/e
322 Wearing apparel	8	7	34	/e
323 Leather and fur products	6	3	14	/e
324 Footwear	16	28	29	/e
331 Wood and wood products	8	11	34	/c
332 Furniture and fixtures	6	8	27	/e
341 Paper and paper products	48	54	84	/e
342 Printing and publishing	32	50	214	/e
351 Industrial chemicals	39	87	390	/e
352 Other chemical products	86	110	290	/e
353 Petroleum refineries	34	50	120	/e
354 Miscellaneous petroleum and coal products	34	77	45	/e
355 Rubber products	26	16	61	/e
356 Plastic products	20	42	79	/e
361 Pottery, china and earthenware	6	8	28	/e
362 Glass and glass products	15	22	72	/e
369 Other non-metal mineral products	63	100	313	/e
371 Iron and steel	88	112	283	/e
372 Non-ferrous metals	34	81	125	/e
381 Metal products	52	53	196	/e
382 Non-electrical machinery	48	68	213	/e
383 Electrical machinery	66	88	373	/e
384 Transport equipment	57	82	271	/e
385 Professional and scientific equipmnt	-	5	17	/e
390 Other manufacturing industries	3	2	4	/e

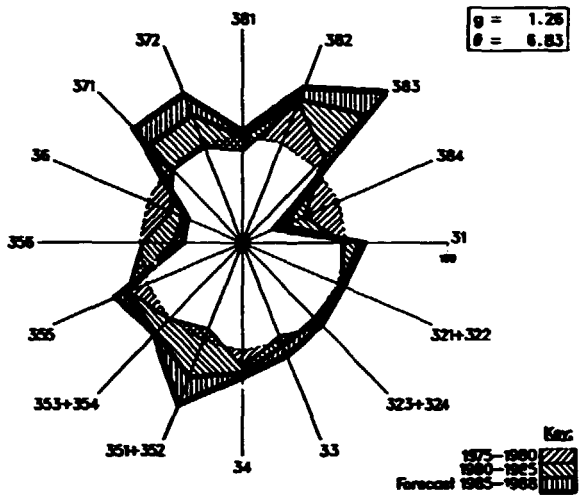




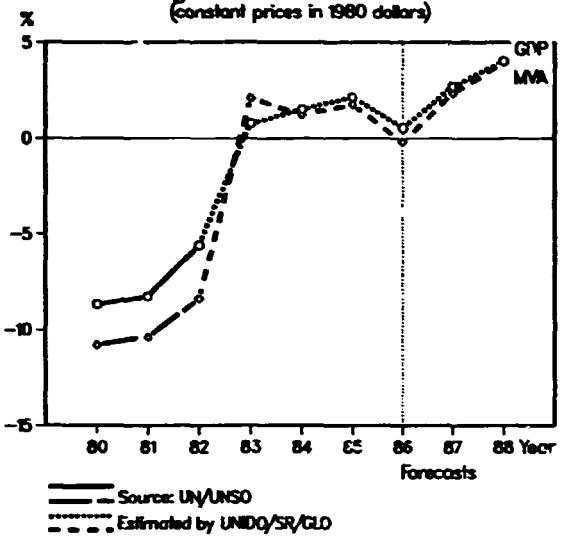


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

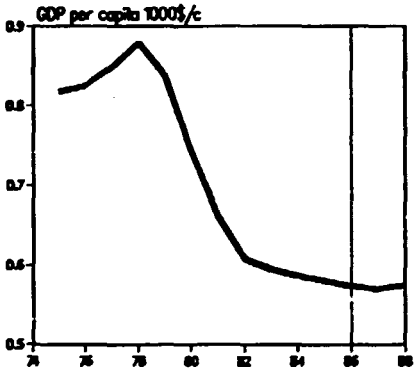


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

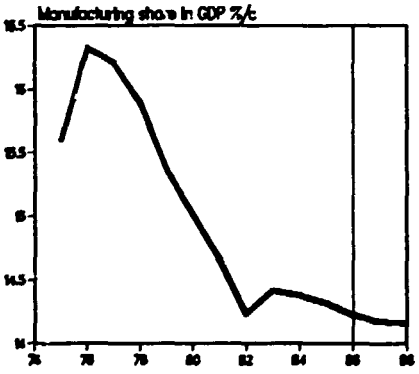


	1975	1980	1985
GDP: /na,c (in million dollars)	3388	3567	3227
Per capita /na,c (in dollars)	818	744	581
Manufacturing share /na,c (%)	15.6	15.0	14.3 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	528	536	462 /e
Value added (in million dollars)	327	448	847 /e
Industrial production index	100	98	111
Gross output (in million dollars)	865	1130	1840 /e
Employment (in thousands)	51	39	36 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	62	60	54 /e
Wages and salaries (%)	9	12	13 /e
Operating surplus (%)	29	27	33 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	16957	28857	51769 /e
Value added / worker	6423	11427	23836 /e
Average wage	1453	3583	6725 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	12.22 /e	2.02 /e	0.85 /e
in percentage of θ in 1970-1975	183 /e	30 /e	13 /e
Growth rate / structural change	3.24 /e	-8.11 /e	2.03 /e
Degree of specialization	23.1 /e	22.7 /e	24.2 /e
-VALUE ADDED: (in million dollars)			
311 Food products	77	78	141 /e
313 Beverages	27	63	100 /e
314 Tobacco products	11	26	48 /e
321 Textiles	84	62	98 /e
322 Wearing apparel	10	16	21 /e
323 Leather and fur products	2	5	8 /e
324 Footwear	9	13	20 /e
331 Wood and wood products	-	1	2 /e
332 Furniture and fixtures	3	3	6 /e
341 Paper and paper products	6	40	62 /e
342 Printing and publishing	10	8	27 /e
351 Industrial chemicals	26	4	12 /e
352 Other chemical products	18	46	113 /e
353 Petroleum refineries	4	14	39 /e
354 Miscellaneous petroleum and coal products	-	2	2 /e
355 Rubber products	2	4	6 /e
356 Plastic products	4	13	30 /e
361 Pottery, china and earthenware	-	-	- /e
362 Glass and glass products	-	-	1 /e
369 Other non-metal mineral products	11	11	27 /e
371 Iron and steel	4	9	10 /e
372 Non-ferrous metals	1	1	1 /e
381 Metal products	5	10	17 /e
382 Non-electrical machinery	1	6	13 /e
383 Electrical machinery	5	9	22 /e
384 Transport equipment	2	1	1 /e
385 Professional and scientific equipment	-	-	3 /e
390 Other manufacturing industries	3	4	9 /e

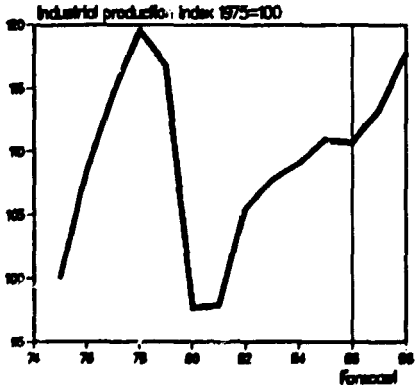
GDP per capita 1000$/c



Manufacturing share in GDP %/c

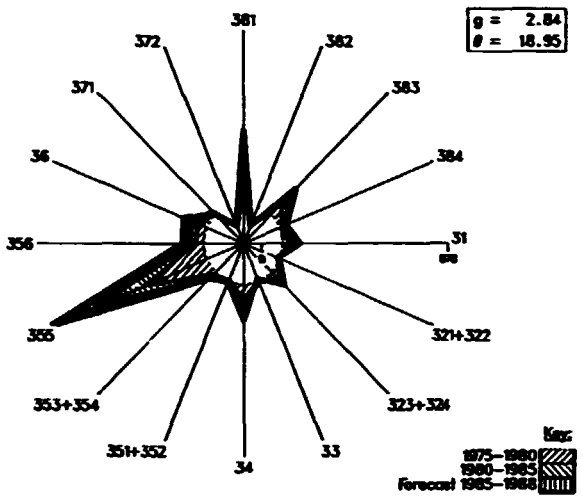


Industrial production index 1975=100

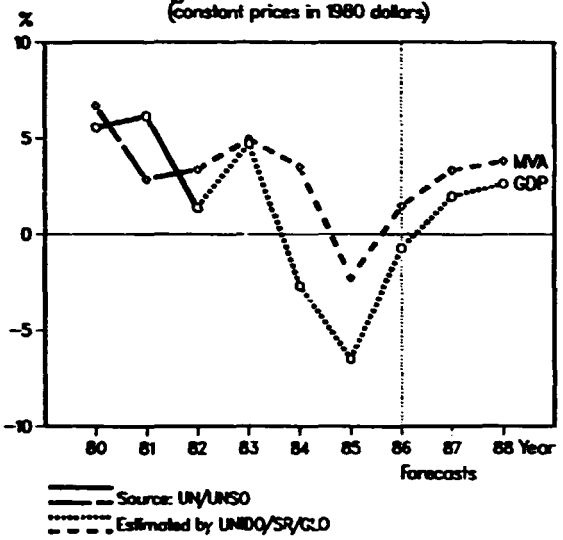


For source, footnotes and comments see "Technical notes" above.

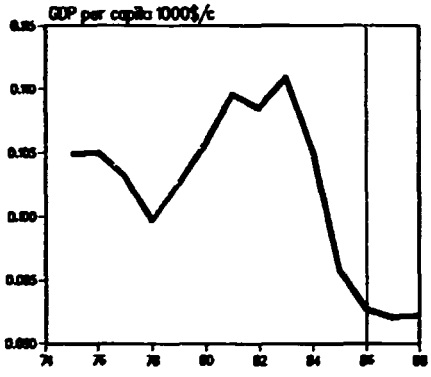
Industrial structural change
(index of value added: 1975=100)

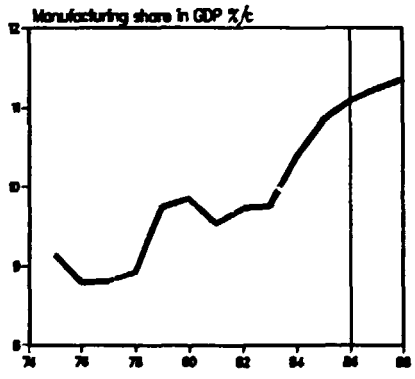


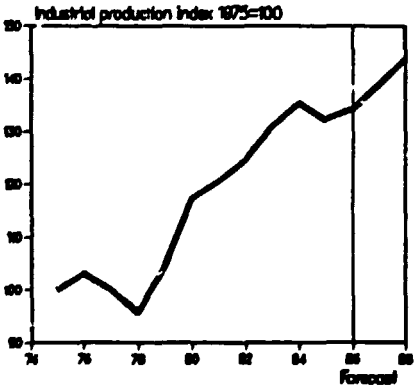
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	3600	4072	4174	
Per capita /na,c (in dollars)	105	106	96	
Manufacturing share /na,c (%)	9.1	9.8	10.8	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	329	401	453	/e
Value added (in million dollars)	212	459	608	/e
Industrial production index	100	117	132	
Gross output (in million dollars)	439	1016	1796	/e
Employment (in thousands)	60	76	91	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	52	55	66	/e
Wages and salaries (%)	10	8	7	/e
Operating surplus (%)	38	37	27	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	7297	13300	19678	/e
Value added / worker	3520	6009	6663	/e
Average wage	764	1082	1381	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	4.38	6.02	3.56	
in percentage of θ in 1970-1975	95	130	77	
Growth rate / structural change	-1.21	2.09	-0.64	
Degree of specialization	22.3	19.2	17.7	
-VALUE ADDED: (in million dollars)				
311 Food products	45	110	142	/e
313 Beverages	31	83	115	/e
314 Tobacco products	9	30	38	/e
321 Textiles	69	106	115	/e
322 Wearing apparel	2	3	8	/e
323 Leather and fur products	2	14	16	/e
324 Footwear	3	10	12	/e
331 Wood and wood products	4	8	9	/e
332 Furniture and fixtures	1	2	4	/e
341 Paper and paper products	2	9	12	/e
342 Printing and publishing	6	11	19	/e
351 Industrial chemicals	-	1	2	/e
352 Other chemical products	7	13	18	/e
353 Petroleum refineries	9	20	33	/e
354 Miscellaneous petroleum and coal products	-	-	-	/e
355 Rubber products	4	8	15	/e
356 Plastic products	2	3	12	/e
361 Pottery, china and earthenware	-	-	-	/e
362 Glass and glass products	1	2	5	/e
369 Other non-metal mineral products	5	8	12	/e
371 Iron and steel	5	9	10	/e
372 Non-ferrous metals	-	-	-	/e
381 Metal products	2	7	11	/e
382 Non-electrical machinery	-	-	-	/e
383 Electrical machinery	-	-	1	/e
384 Transport equipment	-	-	-	/e
385 Professional and scientific equipment	-	-	-	/e
390 Other manufacturing industries	-	-	-	/e

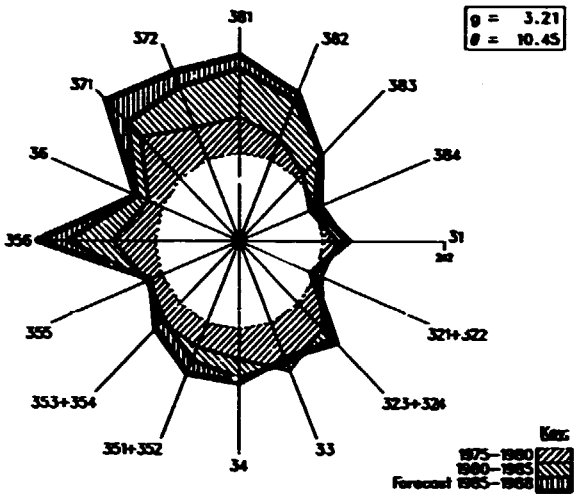




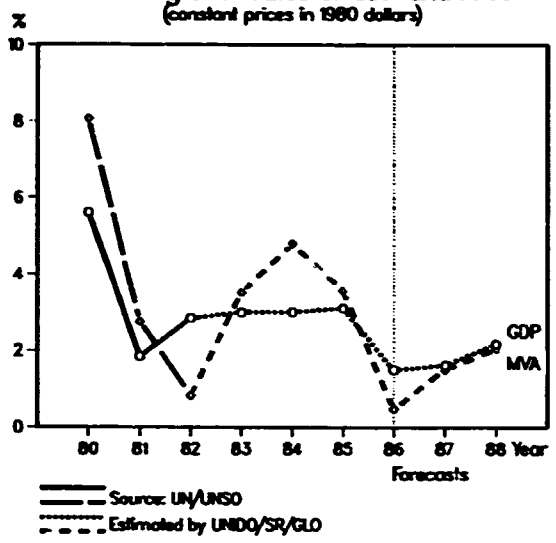


For source, footnotes and comments see "Technical notes" above.

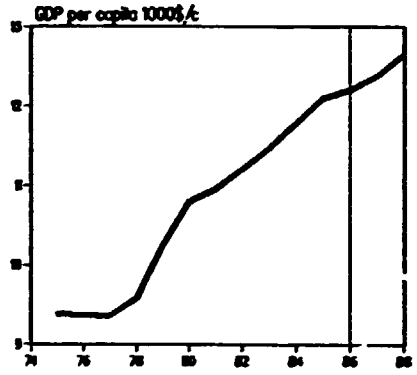
Industrial structural change
(index of value added: 1975=100)

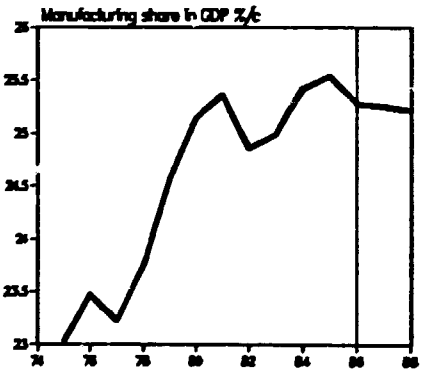


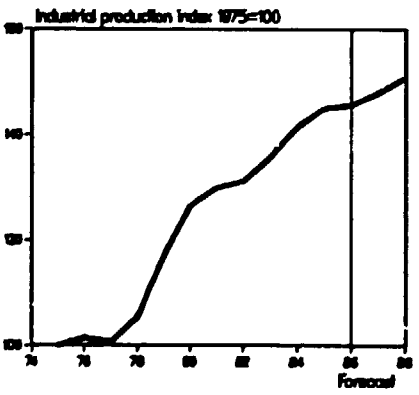
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	44165	51624	59164	
Per capita /na,c (in dollars)	9375	10800	12094	
Manufacturing share /na,c (%)	23.0	25.1	25.5	
MANUFACTURING:				
Value added /na,c (in million dollars)	10171	12978	15107	
Value added (in million dollars)	7363	14343	14268	
Industrial production index	100	126	146	
Gross output (in million dollars)	20644	40839	38432	/e
Employment (in thousands)	519	531	498	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	64	65	63	/e
Wages and salaries (%)	18	15	16	/e
Operating surplus (%)	18	20	22	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	39754	76910	77220	/e
Value added / worker	14159	27012	28668	/e
Average wage	7008	11904	12068	/e
-STRUCTURAL INDICES:				
Structural change δ (in degrees)	9.61	2.69	2.81	
in percentage of θ in 1970-1975	231	65	67	
Growth rate / structural change	-0.54	3.04	0.87	
Degree of specialization	12.7	13.1	13.5	
-VALUE ADDED: (in million dollars)				
311 Food products	805	1402	1484	
313 Beverages	133	225	216	
314 Tobacco products	30	46	56	
321 Textiles	285	469	316	
322 Wearing apparel	277	499	427	
323 Leather and fur products	30	54	40	
324 Footwear	52	134	126	
331 Wood and wood products	291	1196	817	/e
332 Furniture and fixtures	130	757	211	/e
341 Paper and paper products	1017	2088	2023	
342 Printing and publishing	492	1080	1193	
351 Industrial chemicals	367	566	55?	
352 Other chemical products	158	349	366	/e
353 Petroleum refineries	98	445	347	
354 Miscellaneous petroleum and coal products	27	46	45	/e
355 Rubber products	73	105	82	/e
356 Plastic products	82	164	178	/e
361 Pottery, china and earthenware	27	46	38	/e
362 Glass and glass products	49	105	84	
369 Other non-metal mineral products	245	434	440	/e
371 Iron and steel	294	544	500	
372 Non-ferrous metals	68	142	119	
381 Metal products	408	756	836	
382 Non-electrical machinery	867	1469	1694	
383 Electrical machinery	402	694	814	
384 Transport equipment	549	823	892	
385 Professional and scientific equipment	46	110	195	/e
390 Other manufacturing industries	52	107	189	/e

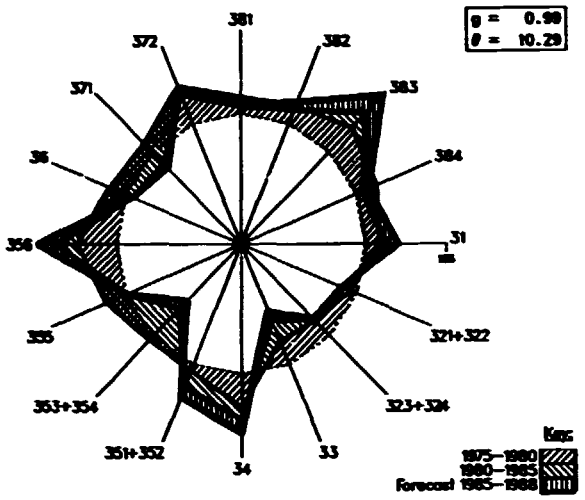




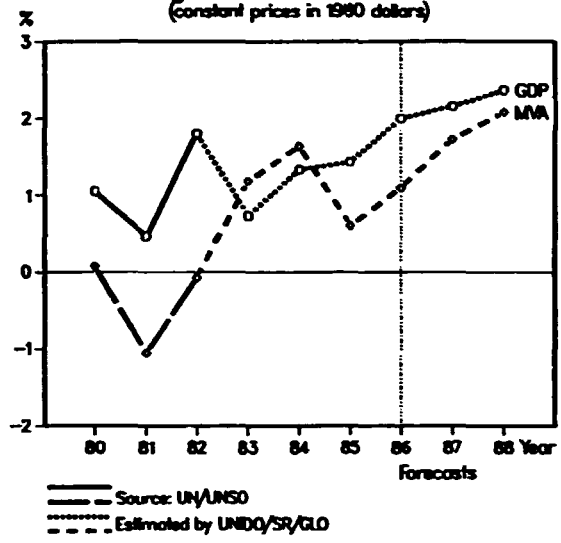


For source, footnotes and comments see "Technical notes" above.

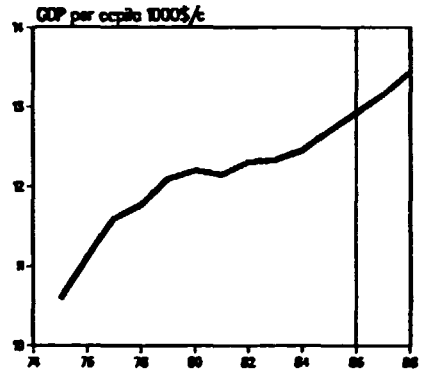
Industrial structural change
(index of value added: 1975=100)

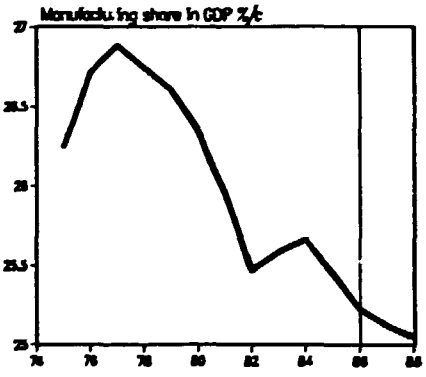


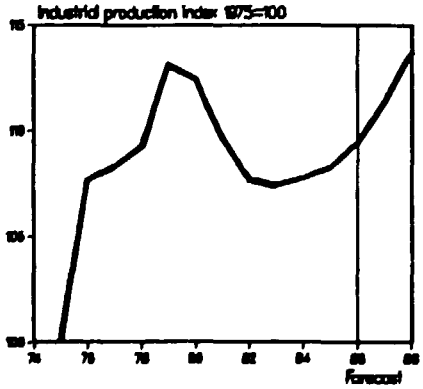
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	568064	655305	693840	
Per capita /na,c (in dollars)	10588	12200	12703	
Manufacturing share /na,c (%)	26.2	26.3	25.5	
MANUFACTURING:				
Value added /na,c (in million dollars)	146437	172648	176585	
Value added (in million dollars)	92687	170066	128774	
Industrial production index	100	112	108	
Gross output (in million dollars)	223238	429530	321702	/e
Employment (in thousands)	5325	5058	4439	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	...	...	...	
Wages and salaries (%)	...	...	...	
Operating surplus (%)	...	...	...	
-PRODUCTIVITY: (in dollars)				
Gross output / worker	41923	84921	72472	/e
Value added / worker	17408	33623	29010	/e
Average wage	...	...	...	
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	4.11	2.08	1.95	
in percentage of θ in 1970-1975	126	64	60	
Growth rate / structural change	-1.65	-0.29	0.24	
Degree of specialization	12.6	13.0	13.7	
-VALUE ADDED: (in million dollars)				
311 Food products	10289	20823	18376	
313 Beverages	2333	4023	3468	
314 Tobacco products	1633	1751	1788	
321 Textiles	4340	6389	4276	
322 Wearing apparel	2473	3975	2781	/e
323 Leather and fur products	513	774	563	
324 Footwear	910	1727	927	
331 Wood and wood products	1353	1751	930	
332 Furniture and fixtures	1060	1727	1276	/e
341 Paper and paper products	2450	4117	3126	/e
342 Printing and publishing	2427	4165	3347	
351 Industrial chemicals	4036	9158	7334	/e
352 Other chemical products	3173	6679	4006	/e
353 Petroleum refineries	5413	9773	7875	
354 Miscellaneous petroleum and coal products	23	118	86	/e
355 Rubber products	1470	3147	2084	/e
356 Plastic products	1470	2982	2707	/e
361 Pottery, china and earthenware	327	639	366	/e
362 Glass and glass products	1027	1988	1488	
369 Other non-metal mineral products	2147	4046	2214	/e
371 Iron and steel	5880	8968	6097	
372 Non-ferrous metals	1377	3005	2014	
381 Metal products	4596	8779	6187	
382 Non-electrical machinery	12459	21633	17782	
383 Electrical machinery	7396	13322	9824	
384 Transport equipment	9666	21633	14932	
385 Professional and scientific equipment	1213	1798	1486	/e
390 Other manufacturing industries	1363	2414	1916	/e

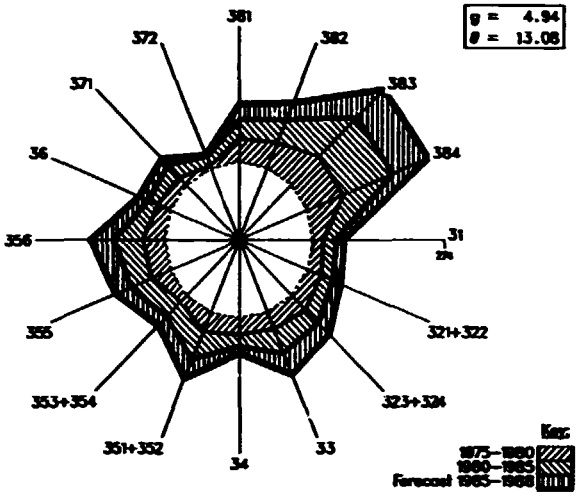




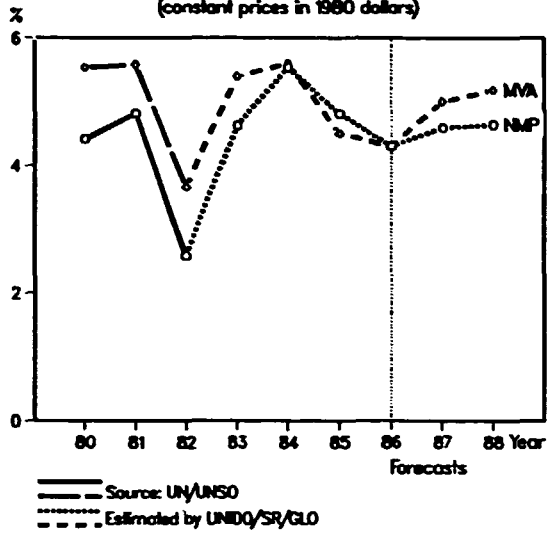


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

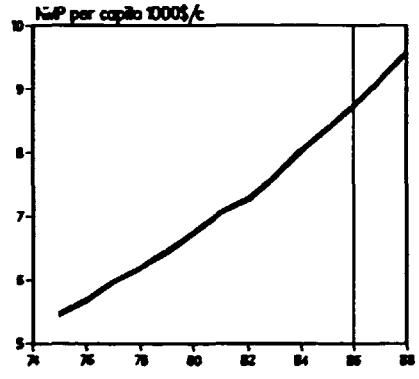


Annual growth rates of MVA and NMP
(constant prices in 1980 dollars)

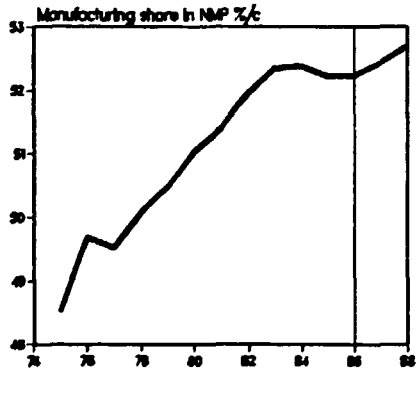


	1975	1980	1985
NMP: /na,c (in million dollars)	92078	112738	140275
Per capita /na,c (in dollars)	5465	6736	8367
Manufacturing share /na,c (%)	48.5	51.0	52.2
MANUFACTURING:			
Value added /na,c (in million dollars)	44674	57548	73259
Value added (in million dollars)	...	...	...
Industrial production index	100	128	163
Gross output (in million dollars)	74137	123830	157039 /e
Employment (in thousands)	2827	2895	2994 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	...	...	...
Wages and salaries (%)	...	...	...
Operating surplus (%)	...	...	...
-PRODUCTIVITY: (in dollars)			
Gross output / worker	26225 /e	42774 /e	52444 /e
Value added / worker	...	...	...
Average wage	4165 /e	6322 /e	5244 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	1.12 /e	1.41 /e	0.79 /e
in percentage of θ in 1970-1975	87 /e	110 /e	62 /e
Growth rate / structural change	5.86 /e	3.29 /e	5.69 /e
Degree of specialization	12.1 /e	13.2 /e	14.3 /e
-VALUE ADDED: (in million dollars)			
311 Food products	...	...	...
313 Beverages	...	...	...
314 Tobacco products	...	...	...
321 Textiles	...	...	...
322 Wearing apparel	...	...	...
323 Leather and fur products	...	...	...
324 Footwear	...	...	...
331 Wood and wood products	...	...	...
332 Furniture and fixtures	...	...	...
341 Paper and paper products	...	...	...
342 Printing and publishing	...	...	...
351 Industrial chemicals	...	...	...
352 Other chemical products	...	...	...
353 Petroleum refineries	...	...	...
354 Miscellaneous petroleum and coal products	...	...	...
355 Rubber products	...	...	...
356 Plastic products	...	...	...
361 Pottery, china and earthenware	...	...	...
362 Glass and glass products	...	...	...
369 Other non-metal mineral products	...	...	...
371 Iron and steel	...	...	...
372 Non-ferrous metals	...	...	...
381 Metal products	...	...	...
382 Non-electrical machinery	...	...	...
383 Electrical machinery	...	...	...
384 Transport equipment	...	...	...
385 Professional and scientific equipment	...	...	...
390 Other manufacturing industries	...	...	...

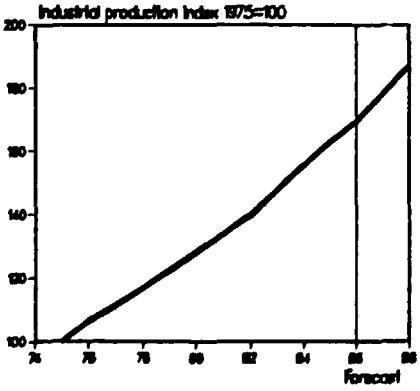
NMP per capita 1000$/c



Manufacturing share in NMP %/c

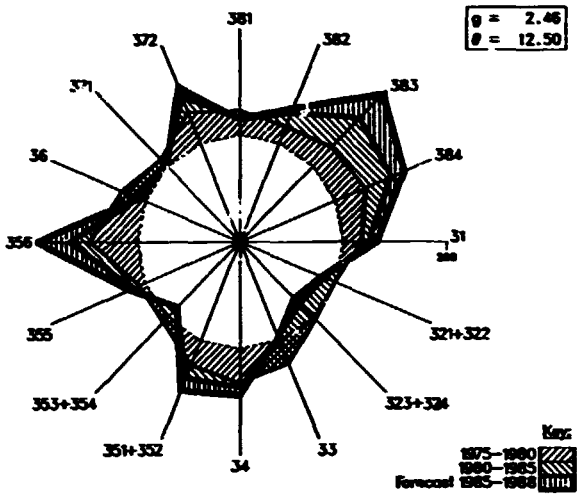


Industrial production index 1975=100

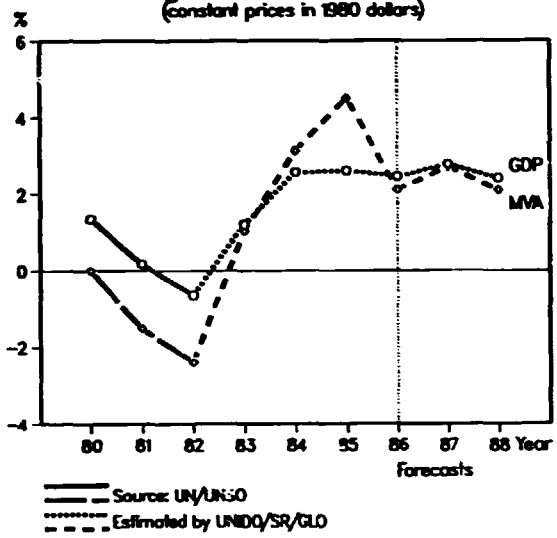


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

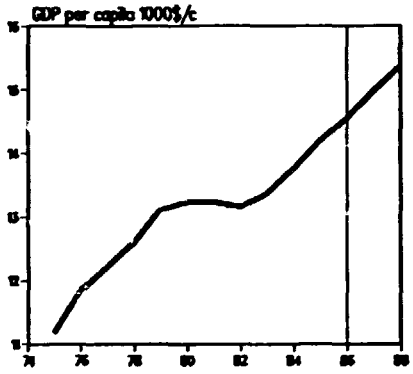


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



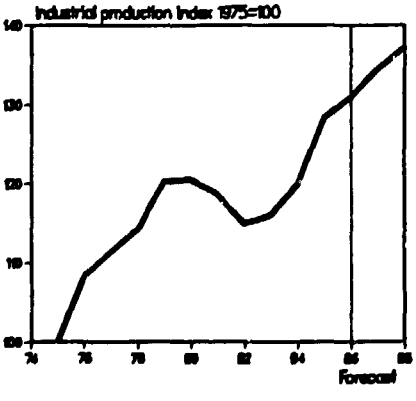
	1975	1980	1985	
GDP: /na,c (in million dollars)	691355	814829	863721	
Per capita /na,c (in dollars)	11181	13235	14188	
Manufacturing share /na,c (%)	33.2	33.0	32.6	
MANUFACTURING:				
Value added /na,c (in million dollars)	229803	269087	281647	
Value added (in million dollars)	143926	266016	201635	
Industrial production index	100	121	128	
Gross output (in million dollars)	290690	632160	487811	/e
Employment (in thousands)	7284	7229	6632	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	50	58	58	/e
Wages and salaries (%)	24	21	19	/e
Operating surplus (%)	25	21	22	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	39906	87448	73554	/e
Value added / worker	19759	36660	30723	/e
Average wage	13755	18471	14242	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	4.46	2.06	3.74	
in percentage of θ in 1970-1975	164	76	137	
Growth rate / structural change	-1.53	0.13	1.85	
Degree of specialization	13.7	14.2	16.8	
-VALUE ADDED: (in million dollars)				
311 Food products	9415	18570	13780	
313 Beverages	4435	6452	4771	
314 Tobacco products	4146	6909	5559	
321 Textiles	4577	6964	4632	
322 Wearing apparel	3276	4934	3111	
323 Leather and fur products	577	936	536	
324 Footwear	687	1206	729	
331 Wood and wood products	2226	4486	2536	/e
332 Furniture and fixtures	3062	5648	3656	/e
341 Paper and paper products	2579	5099	4072	/e
342 Printing and publishing	3439	6150	4279	
351 Industrial chemicals	7992	13944	12021	/e
352 Other chemical products	5240	8003	6793	/e
353 Petroleum refineries	7069	14637	9069	/e
354 Miscellaneous petroleum and coal products	667	990	723	/e
355 Rubber products	1667	3201	2630	/e
356 Plastic products	2549	6096	4866	/e
361 Pottery, china and earthenware	638	732	782	/e
362 Glass and glass products	1159	2492	1624	
369 Other non-metal mineral products	4492	7937	5122	/e
371 Iron and steel	11776	18872	12183	
372 Non-ferrous metals	1419	2608	1682	
381 Metal products	7419	14455	10467	
382 Non-electrical machinery	18660	34283	25875	
383 Electrical machinery	15878	30501	27667	
384 Transport equipment	14906	31232	28134	
385 Professional and scientific equipment	2961	6206	4214	/e
390 Other manufacturing industries	936	1700	1447	/e

GDP per capita 1000$/c



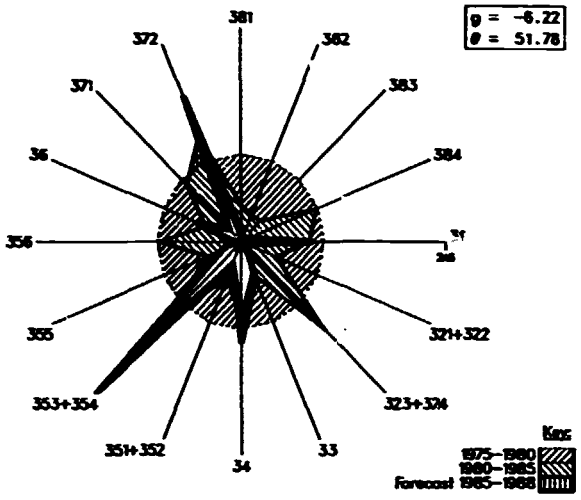
Manufacturing share in GDP %/c

Industrial production index 1975=100

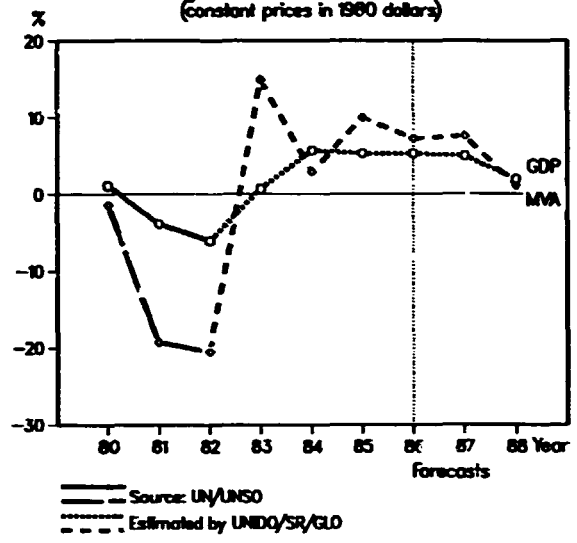


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

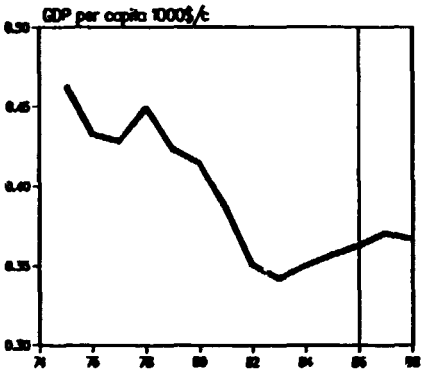


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

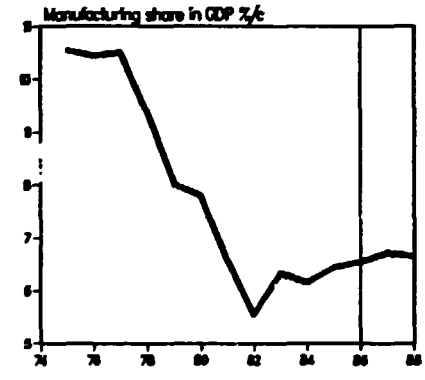


	1975	1980	1985	
GDP: /na,c (in million dollars)	4537	4788	4847	
Per capita /na,c (in dollars)	463	414	357	
Manufacturing share /na,c (%)	10.5	7.8	6.4	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	479	374	312	/e
Value added (in million dollars)	483	883	144	/e
Industrial production index	100	80	37	
Gross output (in million dollars)	1109	1772	281	/e
Employment (in thousands)	77	80	62	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	56	50	49	/e
Wages and salaries (%)	9	10	12	/e
Operating surplus (%)	35	40	39	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	14392	22075	4549	/e
Value added / worker	6272	11005	2331	/e
Average wage	1286	2133	561	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.38	/e 13.86	/e 3.64	/e
in percentage of θ in 1970-1975	124	/e 509	/e 134	/e
Growth rate / structural change	0.04	/e -1.68	/e 2.74	/e
Degree of specialization	27.1	/e 21.4	/e 24.3	/e
-VALUE ADDED: (in million dollars)				
311 Food products	63	71	15	/e
313 Beverages	63	132	28	/e
314 Tobacco products	47	114	34	/e
321 Textiles	57	78	6	/e
322 Wearing apparel	5	9	1	/e
323 Leather and fur products	1	2	-	/e
324 Footwear	3	4	-	/e
331 Wood and wood products	39	56	10	/e
332 Furniture and fixtures	5	6	1	/e
341 Paper and paper products	3	3	1	/e
342 Printing and publishing	10	16	3	/e
351 Industrial chemicals	4	7	1	/e
352 Other chemical products	21	32	5	/e
353 Petroleum refineries	44	159	11	/e
354 Miscellaneous petroleum and coal products	-	-	-	/e
355 Rubber products	11	17	2	/e
356 Plastic products	3	4	1	/e
361 Pottery, china and earthenware	1	2	-	/e
362 Glass and glass products	2	-	-	/e
369 Other non-metal mineral products	8	20	11	/e
371 Iron and steel	3	5	-	/e
372 Non-ferrous metals	52	102	8	/e
381 Metal products	17	23	2	/e
382 Non-electrical machinery	-	-	-	/e
383 Electrical machinery	8	6	1	/e
384 Transport equipment	10	11	2	/e
385 Professional and scientific equipment	-	4	-	/e
390 Other manufacturing industries	1	1	-	/e

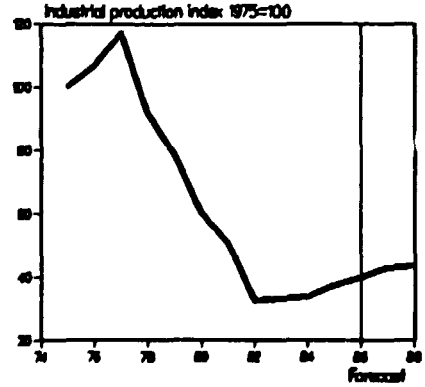
GDP per capita 1000$/c



Manufacturing share in GDP %/c

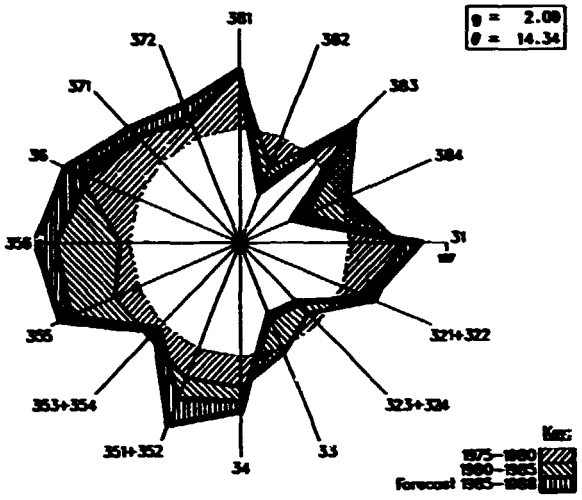


Industrial production index 1975=100

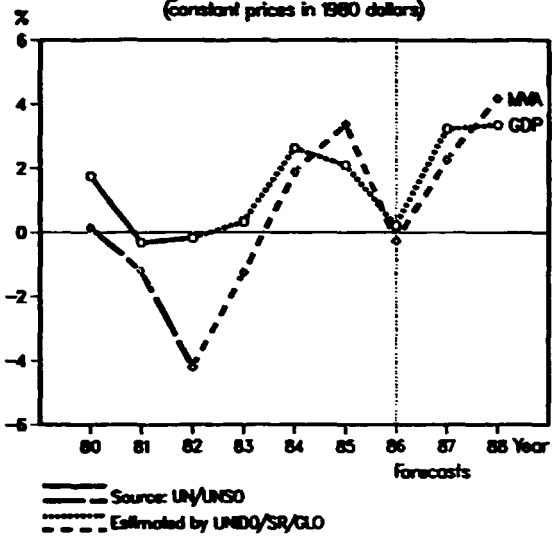


For source, footnotes and comments see "Technical notes" above.

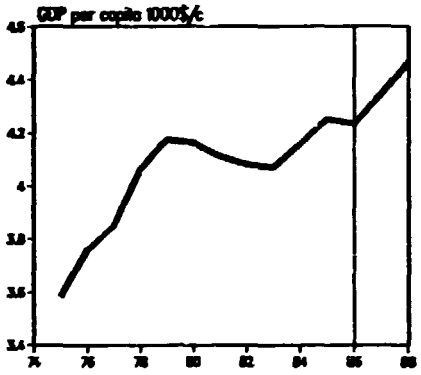
Industrial structural change
(index of value added: 1975=100)

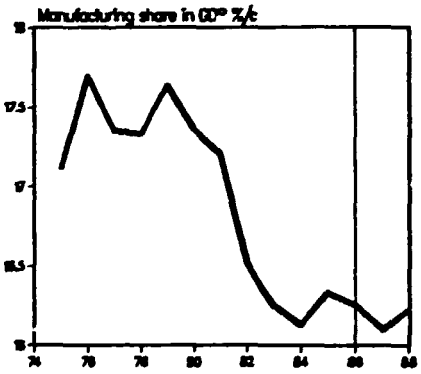


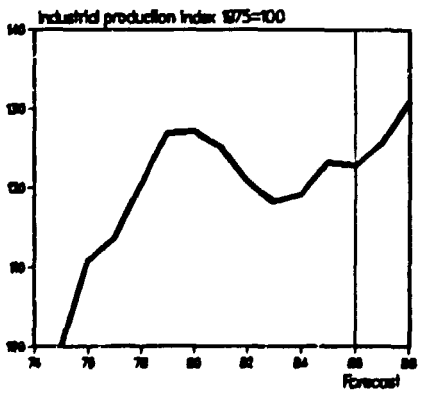
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	32419	40147	41955	
Per capita /na,c (in dollars)	3583	4163	4251	
Manufacturing share /na,c (%)	17.1	17.4	16.3	
MANUFACTURING:				
Value added /na,c (in million dollars)	5547	6958	6958	
Value added (in million [illegible]s)	3674	7716	5796	
Industrial production index	100	127	123	
Gross output (in million dollars)	11678	25291	21785	/e
Employment (in thousands)	426	474	462	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	69	69	74	/e
Wages and salaries (%)	11	12	13	/e
Operating surplus (%)	20	19	13	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	27419	53372	47143	/e
Value added / worker	8627	16283	12249	/e
Average wage	3093	6303	5943	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	5.70	3.10	3.63	
in percentage of θ in 1970-1975	113	61	72	
Growth rate / structural change	1.03	0.08	0.93	
Degree of specialization	9.8	11.0	10.9	
-VALUE ADDED: (in million dollars)				
311 Food products	554	1083	917	
313 Beverages	112	256	228	
314 Tobacco products	63	140	126	
321 Textiles	648	1070	646	
322 Wearing apparel	169	444	345	
323 Leather and fur products	42	89	66	
324 Footwear	53	120	86	
331 Wood and wood products	109	268	166	/e
332 Furniture and fixtures	79	136	71	/e
341 Paper and paper products	63	125	128	/e
342 Printing and publishing	94	199	157	
351 Industrial chemicals	138	189	208	/e
352 Other chemical products	163	329	286	/e
353 Petroleum refineries	88	152	90	/e
354 Miscellaneous petroleum and coal products	12	32	18	/e
355 Rubber products	36	87	43	/e
356 Plastic products	101	216	186	/e
361 Pottery, china and earthenware	36	66	62	/e
362 Glass and glass products	30	54	30	
369 Other non-metal mineral products	207	559	385	/e
371 Iron and steel	99	200	156	
372 Non-ferrous metals	123	245	170	
381 Metal products	245	563	429	
382 Non-electrical machinery	111	181	103	
383 Electrical machinery	166	342	272	
384 Transport equipment	206	536	270	
385 Professional and scientific equipment	7	8	6	/e
390 Other manufacturing industries	36	59	42	/e

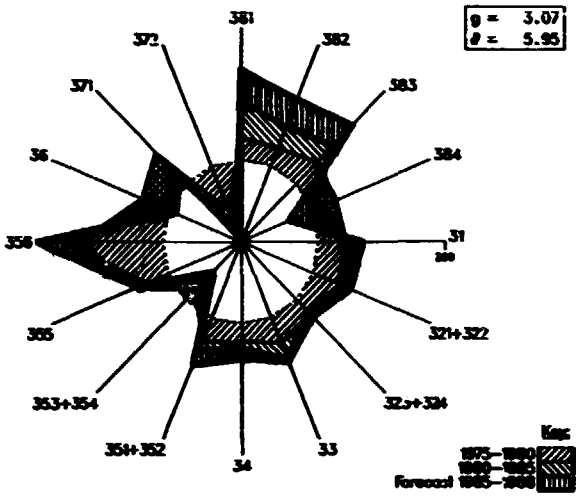




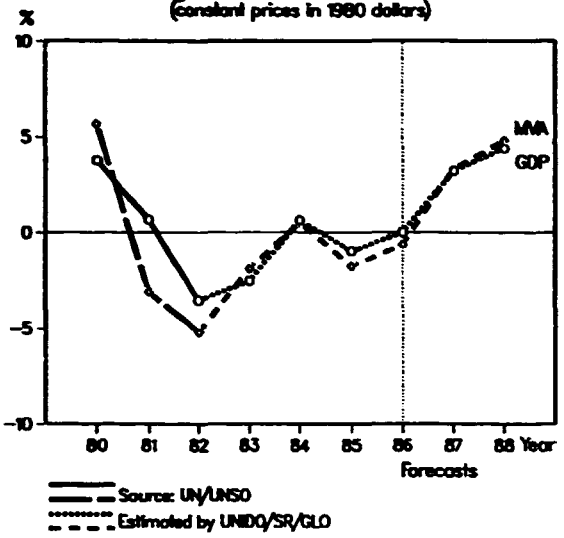


For source, footnotes and comments see "Technical notes" above.

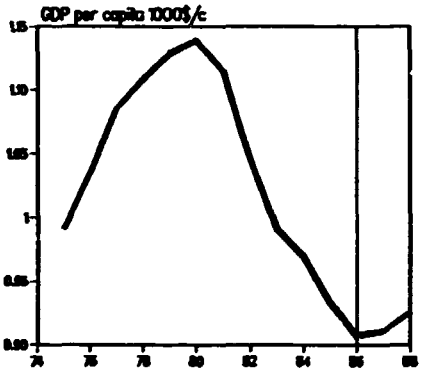
Industrial structural change
(index of value added: 1975=100)

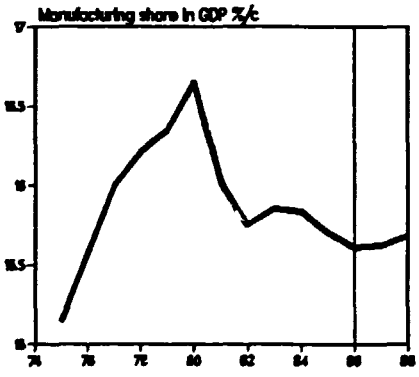


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



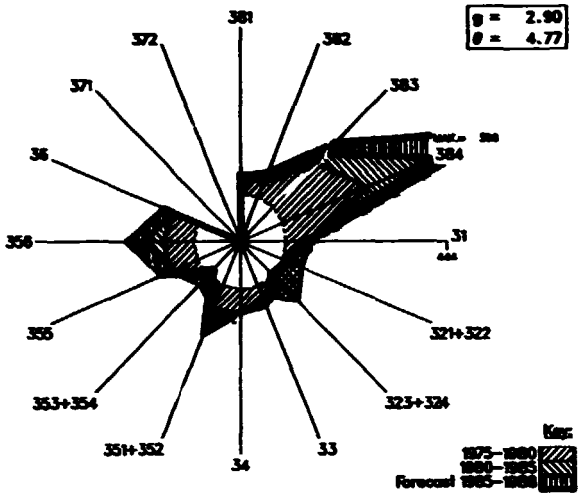
	1975	1980	1985
GDP: /na,c (in million dollars)	5957	7879	7429
Per capita /na,c (in dollars)	991	1139	933
Manufacturing share /na,c (%)	15.1	16.7	15.7 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	904	1312	1167 /e
Value added (in million dollars)	402	913 /e	1255 /e
Industrial production index	100	132	138
Gross output (in million dollars)	1149	1948	2467 /e
Employment (in thousands)	68	80	77 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	65	53 /e	49 /e
Wages and salaries (%)	8	9	10 /e
Operating surplus (%)	27	38 /e	41 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	16803	24406	31955 /e
Value added / worker	5872	11439 /e	16257 /e
Average wage	1408	2233	3298 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	4.03 /e	1.32 /e	0.90 /e
in percentage of θ in 1970-1975	154 /e	51 /e	35 /e
Growth rate / structural change	-0.82 /e	1.12 /e	-1.96 /e
Degree of specialization	25.7 /e	25.4 /e	27.2 /e
-VALUE ADDED: (in million dollars)			
311 Food products	116	284 /e	376 /e
313 Beverages	33	90 /e	119 /e
314 Tobacco products	13	14 /e	23 /e
321 Textiles	36	59 /e	83 /e
322 Wearing apparel	15	27 /e	40 /e
323 Leather and fur products	3	4 /e	6 /e
324 Footwear	5	14 /e	19 /e
331 Wood and wood products	7	16 /e	22 /e
332 Furniture and fixtures	3	4 /e	6 /e
341 Paper and paper products	10	16 /e	23 /e
342 Printing and publishing	12	26 /e	39 /e
351 Industrial chemicals	20	28 /e	49 /e
352 Other chemical products	41	90 /e	122 /e
353 Petroleum refineries	5	14 /e	21 /e
354 Miscellaneous petroleum and coal products	1	1 /e	2 /e
355 Rubber products	8	13 /e	20 /e
356 Plastic products	7	21 /e	28 /e
361 Pottery, china and earthenware	-	1 /e	1 /e
362 Glass and glass products	10	29 /e	38 /e
369 Other non-metal mineral products	20	45 /e	67 /e
371 Iron and steel	5	13 /e	19 /e
372 Non-ferrous metals	-	1 /e	1 /e
381 Metal products	13	43 /e	57 /e
382 Non-electrical machinery	3	7 /e	9 /e
383 Electrical machinery	7	26 /e	34 /e
384 Transport equipment	6	9 /e	12 /e
385 Professional and scientific equipment	-	1 /e	1 /e
390 Other manufacturing industries	2	14 /e	18 /e



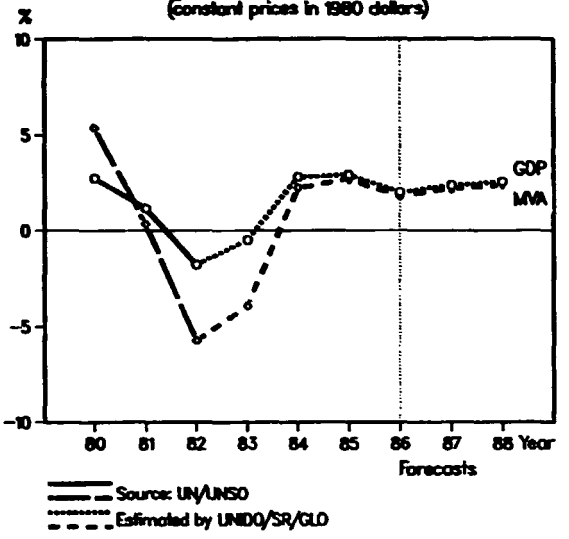


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

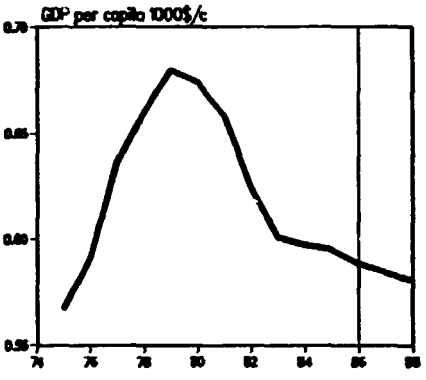


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

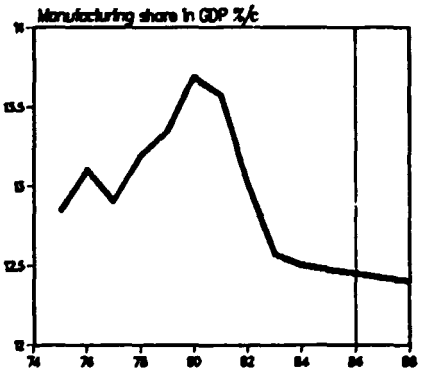


	1975	1980	1985
GDP: /na,c (in million dollars)	1753	2488	2603
Per capita /na,c (in dollars)	567	674	595
Manufacturing share /na,c (%)	12.8	13.7	12.5 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	225	341	325 /e
Value added (in million dollars)	137	283 /e	407 /e
Industrial production index	100	147	136
Gross output (in million dollars)	493	905 /e	1256 /e
Employment (in thousands)	37	44 /e	55 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	72	69 /e	68 /e
Wages and salaries (%)	10	11 /e	15 /e
Operating surplus (%)	17	20 /e	18 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	13411	20386 /e	23031 /e
Value added / worker	3715	6368 /e	7462 /e
Average wage	1392	2276 /e	3392 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	5.22	7.03	0.96
in percentage of θ in 1970-1975	88	119	16
Growth rate / structural change	1.00	-0.18	2.78
Degree of specialization	21.8	22.4	22.8
-VALUE ADDED: (in million dollars)			
311 Food products	32	79	114 /e
313 Beverages	34	62	91 /e
314 Tobacco products	10	20	23 /e
321 Textiles	7	11	9 /e
322 Wearing apparel	4	9	15 /e
323 Leather and fur products	1	2	2 /e
324 Footwear	1	4	2 /e
331 Wood and wood products	11	18	27 /e
332 Furniture and fixtures	2	5	10 /e
341 Paper and paper products	2	5	6 /e
342 Printing and publishing	3	5	6 /e
351 Industrial chemicals	1	1	2 /e
352 Other chemical products	5	12	18 /e
353 Petroleum refineries	1	1	1 /e
354 Miscellaneous petroleum and coal products	-	- /e	- /e
355 Rubber products	3	5 /e	5 /e
356 Plastic products	3	8 /e	11 /e
361 Pottery, china and earthenware	-	1 /e	1 /e
362 Glass and glass products	-	- /e	- /e
369 Other non-metal mineral products	7	15 /e	21 /e
371 Iron and steel	-	- /e	- /e
372 Non-ferrous metals	-	-	- /e
381 Metal products	6	13 /e	17 /e
382 Non-electrical machinery	-	1 /e	1 /e
383 Electrical machinery	1	3 /e	7 /e
384 Transport equipment	-	- /e	1 /e
385 Professional and scientific equipment	-	- /e	- /e
390 Other manufacturing industries	1	2	3 /e

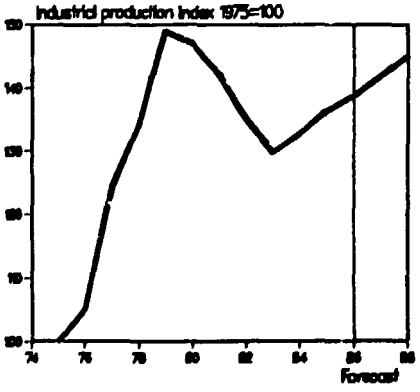
GDP per capita 1000$/c



Manufacturing share in GDP %/c

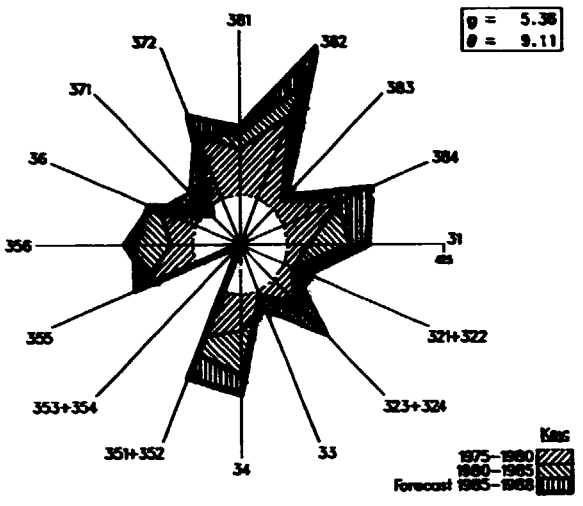


Industrial production index 1975=100

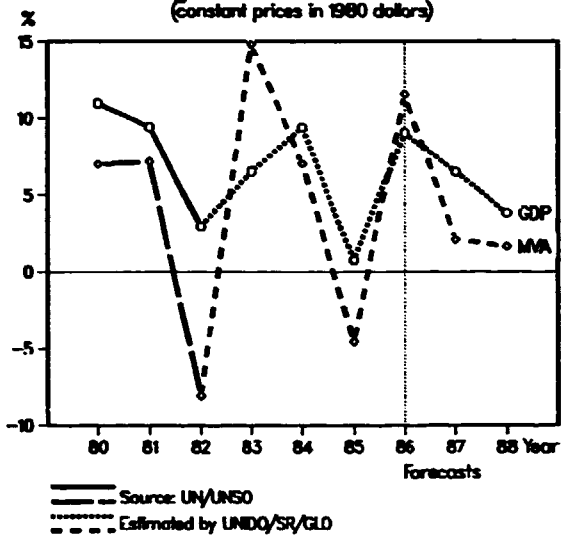


For source, footnotes and comments see "Technical notes" above.

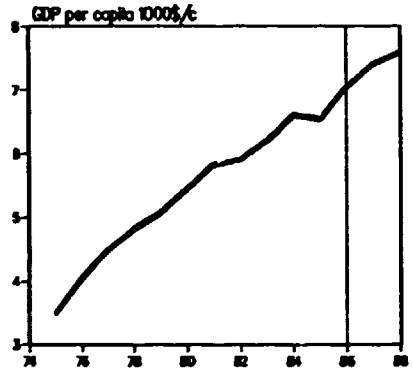
Industrial structural change
(index of value added: 1975=100)

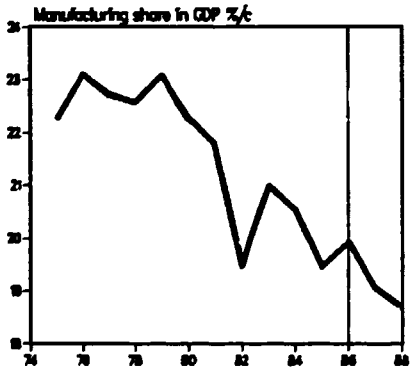


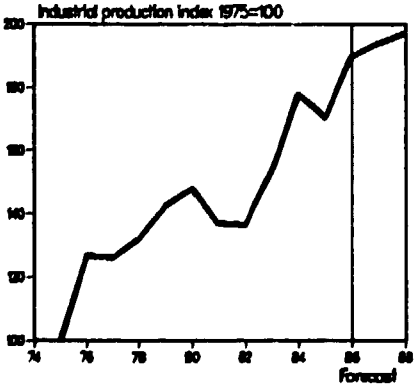
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	15352	27442	36285	
Per capita /na,c (in dollars)	3492	5446	6540	
Manufacturing share /na,c (%)	22.3	22.3	19.5	
MANUFACTURING:				
Value added /na,c (in million dollars)	3417	6110	7062	
Value added (in million dollars)	2597	7341	8916	
Industrial production index	100	148	170	
Gross output (in million dollars)	7461	22182	26721	/e
Employment (in thousands)	692	924	898	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	65	67	67	/e
Wages and salaries (%)	18	17	16	/e
Operating surplus (%)	17	16	18	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	10786	24015	29749	/e
Value added / worker	3754	7948	9927	/e
Average wage	1972	4136	4643	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.72	5.92	4.83	
in percentage of θ in 1970-1975	54	86	70	
Growth rate / structural change	2.09	0.64	-0.86	
Degree of specialization	32.3	24.8	23.3	
-VALUE ADDED: (in million dollars)				
311 Food products	71	161	234	
313 Beverages	39	99	140	
314 Tobacco products	38	81	171	
321 Textiles	530	1027	1318	
322 Wearing apparel	579	1920	1899	
323 Leather and fur products	8	43	40	/e
324 Footwear	15	59	47	/e
331 Wood and wood products	27	45	47	/e
332 Furniture and fixtures	25	62	69	/e
341 Paper and paper products	31	110	135	
342 Printing and publishing	99	290	413	
351 Industrial chemicals	8	40	48	/e
352 Other chemical products	33	77	97	/e
353 Petroleum refineries	-	-	-	
354 Miscellaneous petroleum and coal products	-	-	-	
355 Rubber products	19	29	18	
356 Plastic products	219	563	842	
361 Pottery, china and earthenware	2	5	6	/e
362 Glass and glass products	5	10	16	/e
369 Other non-metal mineral products	11	55	74	/e
371 Iron and steel	19	29	26	/e
372 Non-ferrous metals	10	35	37	/e
381 Metal products	192	638	79[illegible]	
382 Non-electrical machinery	69	188	2[illegible]	
383 Electrical machinery	256	987	1367	
384 Transport equipment	77	176	202	
385 Professional and scientific equipment	66	362	381	
390 Other manufacturing industries	70	250	254	

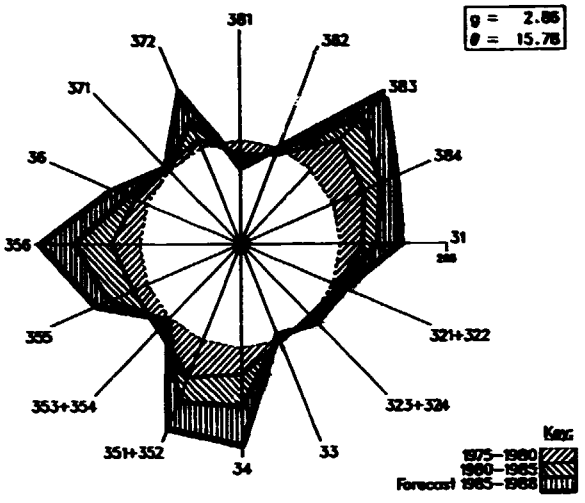




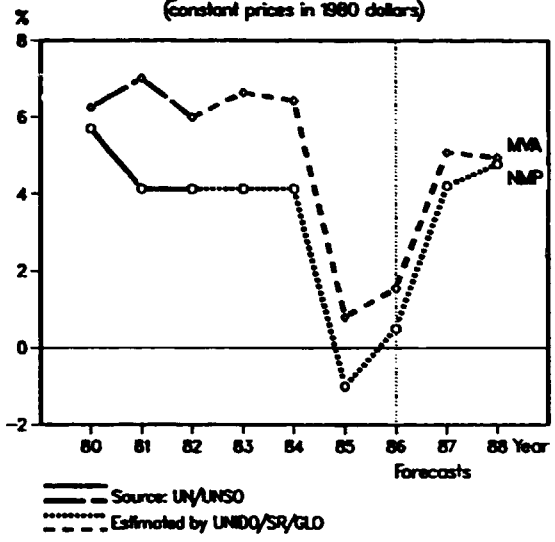


For source, footnotes and comments see "Technical notes" above.

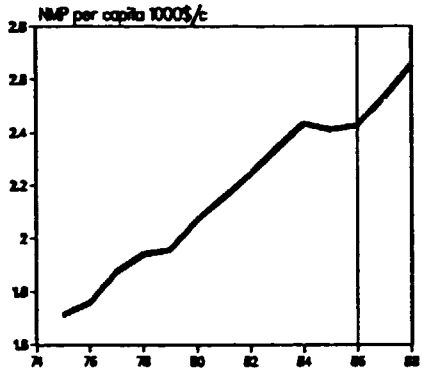
Industrial structural change
(index of value added: 1975=100)

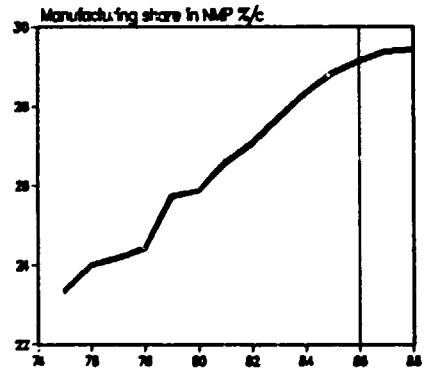


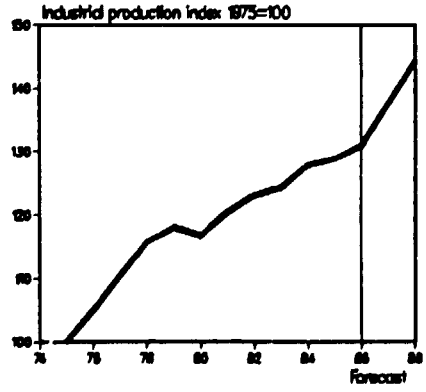
Annual growth rates of MVA and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
MVP: /na,c (in million dollars)	18068	22164	25806	
Per capita /na,c (in dollars)	1714	2069	2412	
Manufacturing share /na,c (%)	23.3	25.9	28.8	
MANUFACTURING:				
Value added /na,c (in million dollars)	4217	5735	7442	
Value added (in million dollars)	10064	8681	5320	
Industrial production index	100	117	129	
Gross output (in million dollars)	26625	36586	22172	/e
Employment (in thousands)	1553	1384	1267	
-PROFITABILITY:(in percent of gross output)				
Intermediate input (%)	62	76	76	/e
Wages and salaries (%)	9	8	8	/e
Operating surplus (%)	29	16	16	/e
-PRODUCTIVITY:(in dollars)				
Gross output / worker	17144	26436	17500	/e
Value added / worker	6480	6272	4199	/e
Average wage	1506	2112	1381	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	2.16	1.76	1.83	
in percentage of θ in 1970-1975	81	66	68	
Growth rate / structural change	2.08	-0.62	0.44	
Degree of specialization	9.5	9.9	10.3	
-VALUE ADDED:(in million dollars)				
311 Food products	931	815	368	/e
313 Beverages	241	122	104	/e
314 Tobacco products	32	40	31	/e
321 Textiles	595	519	328	/e
322 Wearing apparel	280	285	155	/e
323 Leather and fur products	84	71	35	/e
324 Footwear	150	117	86	/e
331 Wood and wood products	145	120	37	/e
332 Furniture and fixtures	145	148	80	/e
341 Paper and paper products	174	139	102	/e
342 Printing and publishing	131	122	89	/e
351 Industrial chemicals	559	513	342	/e
352 Other chemical products	398	356	298	/e
353 Petroleum refineries	394	227	164	/e
354 Miscellaneous petroleum and coal products	-	-	-	/e
355 Rubber products	116	81	63	/e
356 Plastic products	116	90	74	/e
361 Pottery, china and earthenware	76	84	45	/e
362 Glass and glass products	90	103	76	/e
369 Other non-metal mineral products	293	299	192	/e
371 Iron and steel	807	544	252	/e
372 Non-ferrous metals	242	317	76	/e
381 Metal products	419	314	191	/e
382 Non-electrical machinery	976	731	535	/e
383 Electrical machinery	1039	962	701	/e
384 Transport equipment	827	715	460	/e
385 Professional and scientific equipment	381	399	266	/e
390 Other manufacturing industries	424	348	173	/e

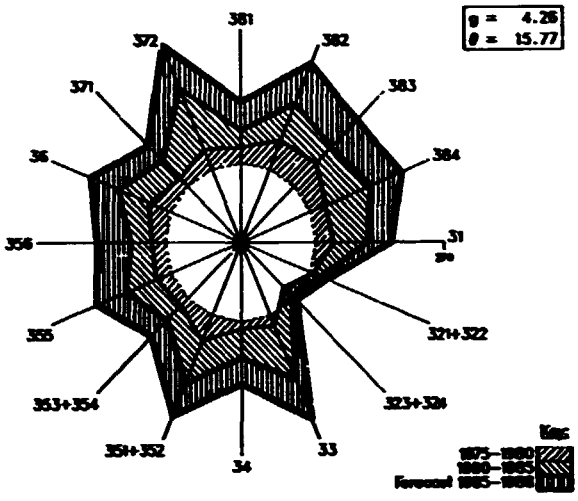




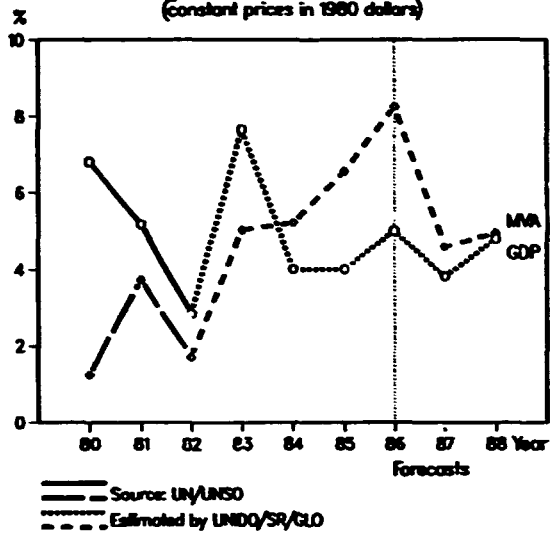


For source, footnotes and comments see "Technical notes" above.

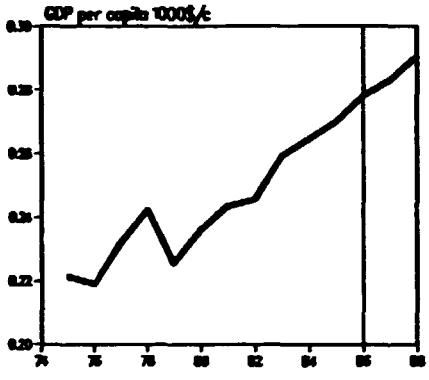
Industrial structural change
(Index of value added: 1975=100)

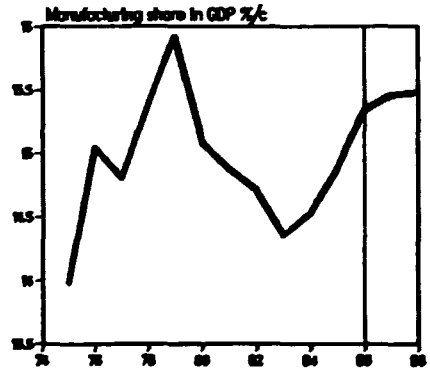


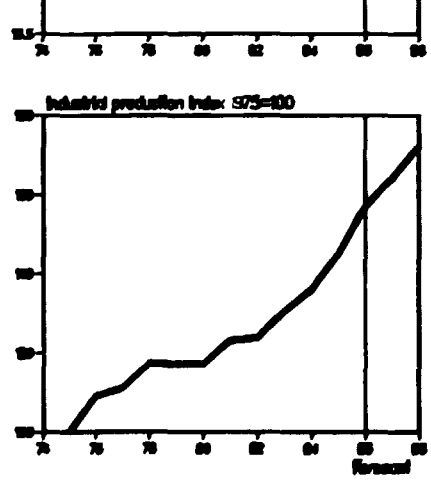
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	137382	162884	204934	
Per capita /na,c (in dollars)	221	235	270	
Manufacturing share /na,c (%)	14.0	15.1	14.9	
MANUFACTURING:				
Value added /na,c (in million dollars)	19195	24648	30497	
Value added (in million dollars)	7674	13086	16934	
Industrial production index	100	117	145	
Gross output (in million dollars)	33086	71367	98088	/e
Employment (in thousands)	5680	6892	7700	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	77	82	82	/e
Wages and salaries (%)	11	9	8	/e
Operating surplus (%)	12	9	10	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	5825	10210	12480	/e
Value added / worker	1351	1872	2199	/e
Average wage	638	949	1013	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	2.69	2.36	1.39	
in percentage of θ in 1970-1975	78	71	42	
Growth rate / structural change	1.05	0.04	4.84	
Degree of specialization	16.9	15.4	13.6	
-VALUE ADDED: (in million dollars)				
311 Food products	640	889	1295	/e
313 Beverages	42	99	122	/e
314 Tobacco products	160	196	207	/e
321 Textiles	1425	2542	2581	/e
322 Wearing apparel	22	62	90	/e
323 Leather and fur products	25	48	63	/e
324 Footwear	21	37	44	/e
331 Wood and wood products	44	74	76	/e
332 Furniture and fixtures	6	8	10	/e
341 Paper and paper products	236	286	218	/e
342 Printing and publishing	143	256	354	/e
351 Industrial chemicals	564	778	1367	/e
352 Other chemical products	592	1062	1287	/e
353 Petroleum refineries	129	203	483	/e
354 Miscellaneous petroleum and coal products	68	151	171	/e
355 Rubber products	169	234	323	/e
356 Plastic products	36	93	117	/e
361 Pottery, china and earthenware	16	47	82	/e
362 Glass and glass products	43	87	84	/e
369 Other non-metal mineral products	241	388	518	/e
371 Iron and steel	884	1488	1980	/e
372 Non-ferrous metals	132	81	161	/e
381 Metal products	224	421	423	/e
382 Non-electrical machinery	820	1130	1676	/e
383 Electrical machinery	680	1061	1523	/e
384 Transport equipment	532	1088	1649	/e
385 Professional and scientific equipment	44	92	138	/e
390 Other manufacturing industries	36	72	80	/e

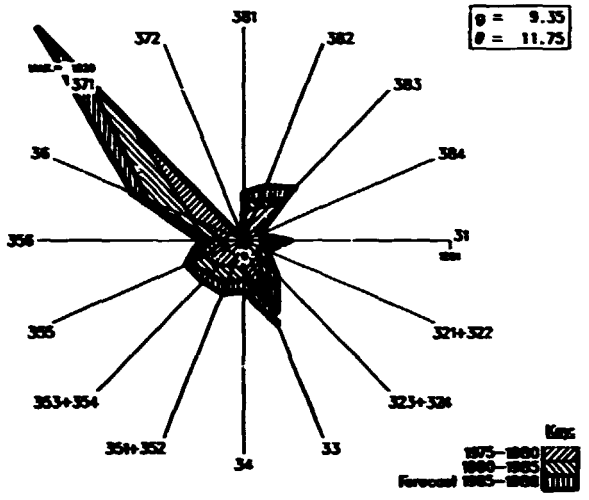




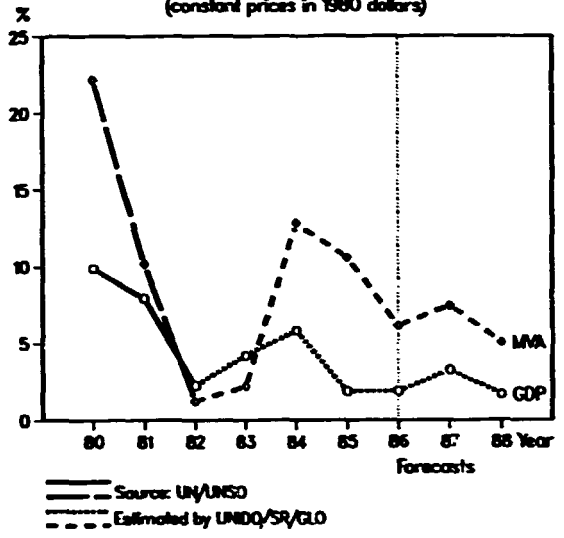


For source, footnotes and comments see "Technical notes" above.

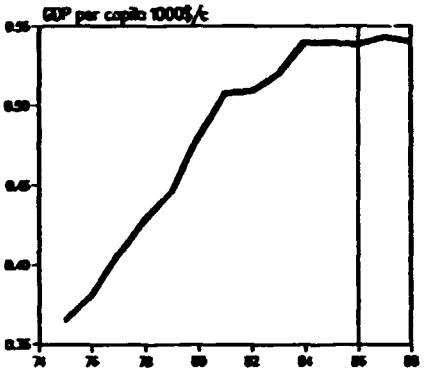
Industrial structural change
(index of value added: 1975=100)

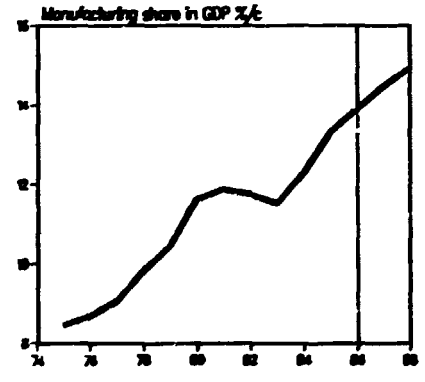


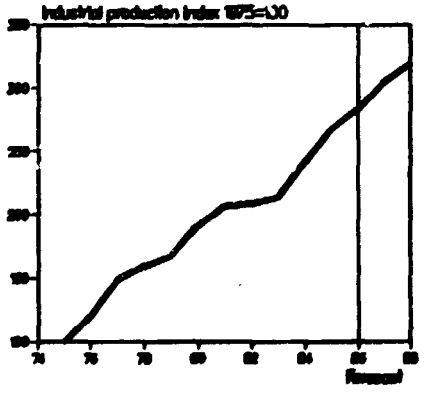
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	49520	72482	88863
Per capita /na,c (in dollars)	365	480	540
Manufacturing share /na,c (%)	8.5	11.6	13.3
MANUFACTURING:			
Value added /na,c (in million dollars)	4195	8434	11980
Value added (in million dollars)	1426	4384 /e	5476 /e
Industrial production index	100	192	267
Gross output (in million dollars)	4640	11589 /e	14730 /e
Employment (in thousands)	763	986 /e	1244 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	69	69	72 /e
Wages and salaries (%)	8	7	7 /e
Operating surplus (%)	23	25	20 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	4886	11753 /e	11836 /e
Value added / worker	1542	3627 /e	3291 /e
Average wage	416	743	874 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	6.48	4.62	3.02
in percentage of θ in 1970-1975	191	136	89
Growth rate / structural change	0.19	3.15	3.50
Degree of specialization	29.1	22.1	30.0
-VALUE ADDED: (in million dollars)			
311 Food products	289	376	432 /e
313 Beverages	28	51	80 /e
314 Tobacco products	168	849	620 /e
321 Textiles	173	420	492 /e
322 Wearing apparel	2	16	72 /e
323 Leather and fur products	3	6	17 /e
324 Footwear	17	26	24 /e
331 Wood and wood products	40	230	285 /e
332 Furniture and fixtures	4	6	7 /e
341 Paper and paper products	19	61	41 /e
342 Printing and publishing	22	51	60 /e
351 Industrial chemicals	80	145	244 /e
352 Other chemical products	59	241	239 /e
353 Petroleum refineries	285	978	1380 /e
354 Miscellaneous petroleum and coal products	-	-	- /e
355 Rubber products	21	164	117 /e
356 Plastic products	13	25	66 /e
361 Pottery, china and earthenware	2	8	14 /e
362 Glass and glass products	7	26	42 /e
369 Other non-metal mineral products	62	200	180 /e
371 Iron and steel	3	107	501 /e
372 Non-ferrous metals	10	8 /e	5 /e
381 Metal products	41	118	160 /e
382 Non-electrical machinery	19	53	53 /e
383 Electrical machinery	44	180	130 /e
384 Transport equipment	49	217	215 /e
385 Professional and scientific equipment	-	2	2 /e
390 Other manufacturing industries	3	13	14 /e

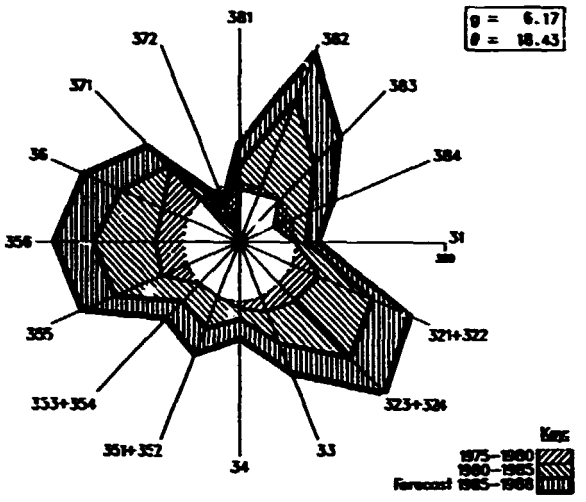




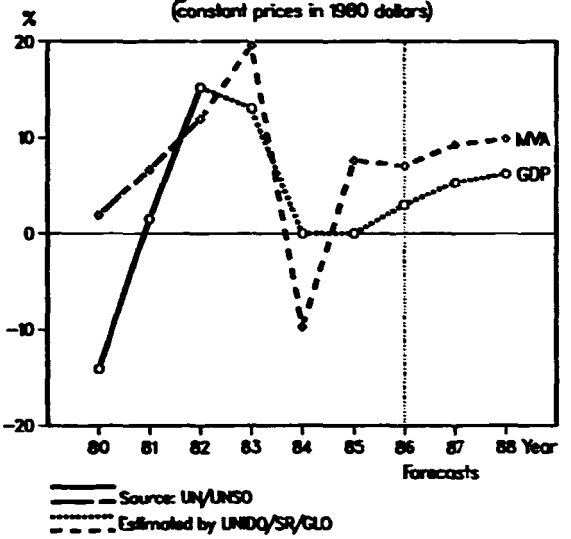


For source, footnotes and comments see "Technical notes" above.

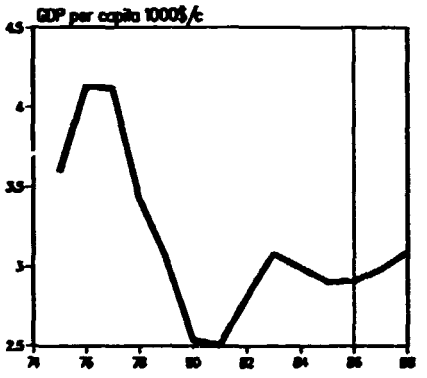
Industrial structural change
(index of value added: 1975=100)

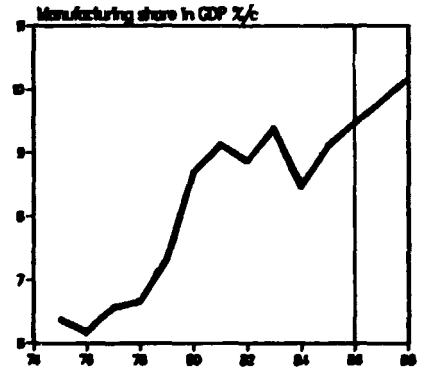


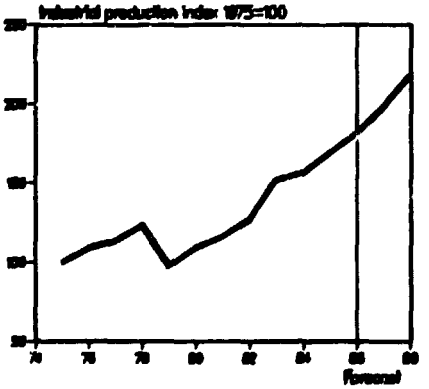
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	119879	98081	129880 /e
Per capita /na,c (in dollars)	3695	2539	2906 /e
Manufacturing share /na,c (%)	6.4	8.7	9.1 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	7652	8528	11817 /e
Value added (in million dollars)	3153	8186	13656 /e
Industrial production index	100	109	169
Gross output (in million dollars)	7900	15869	28470 /e
Employment (in thousands)	419	470	617 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	60	48	52 /e
Wages and salaries (%)	11	29	26 /e
Operating surplus (%)	29	23	21 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	18764	33753	46126 /e
Value added / worker	7527	17409	21963 /e
Average wage	2062	9867	12077 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	11.54 /e	6.69 /e	1.14 /e
in percentage of θ in 1970-1975	163 /e	94 /e	16 /e
Growth rate / structural change	1.98 /e	1.74 /e	7.34 /e
Degree of specialization	19.0 /e	19.3 /e	18.8 /e
-VALUE ADDED: (in million dollars)			
311 Food products	454	930	1419 /e
313 Beverages	43	145	247 /e
314 Tobacco products	146	190	262 /e
321 Textiles	443	1329	2839 /e
322 Wearing apparel	9	78	70 /e
323 Leather and fur products	23	36	91 /e
324 Footwear	39	100	233 /e
331 Wood and wood products	28	68	137 /e
332 Furniture and fixtures	14	33	72 /e
341 Paper and paper products	54	135	320 /e
342 Printing and publishing	62	80	120 /e
351 Industrial chemicals	131	93	225 /e
352 Other chemical products	150	278	880 /e
353 Petroleum refineries	51	1852	69 /e
354 Miscellaneous petroleum and coal products	1	2	21 /e
355 Rubber products	47	93	242 /e
356 Plastic products	30	198	378 /e
361 Pottery, china and earthenware	16	45	61 /e
362 Glass and glass products	80	115	163 /e
369 Other non-metal mineral products	347	819	1679 /e
371 Iron and steel	238	367	476 /e
372 Non-ferrous metals	22	48	185 /e
381 Metal products	184	319	664 /e
382 Non-electrical machinery	84	208	606 /e
383 Electrical machinery	220	391	945 /e
384 Transport equipment	216	389	1249 /e
385 Professional and scientific equipment	5	24	80 /e
390 Other manufacturing industries	1	11	28 /e

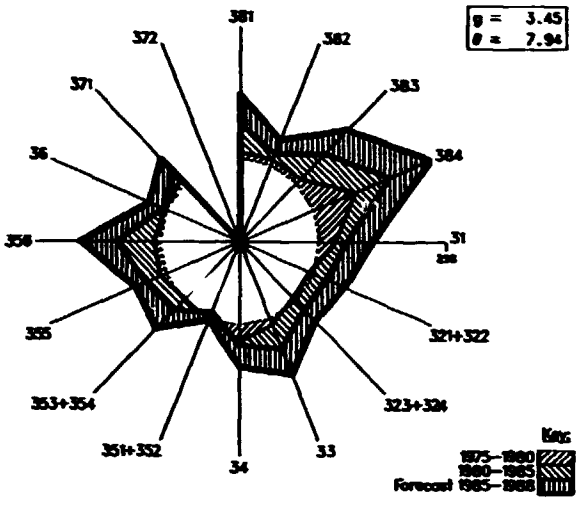




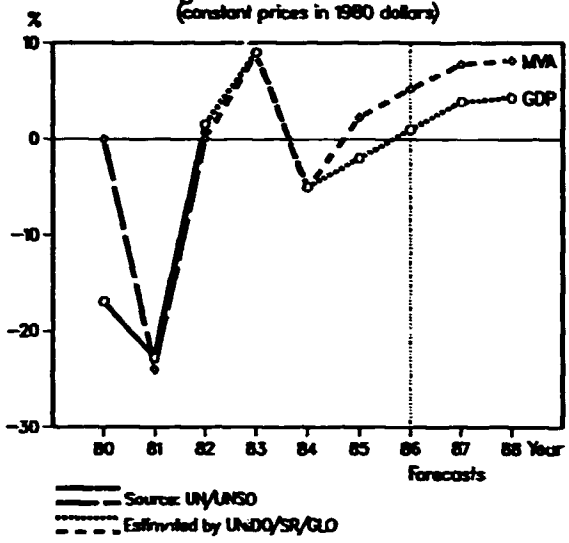


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

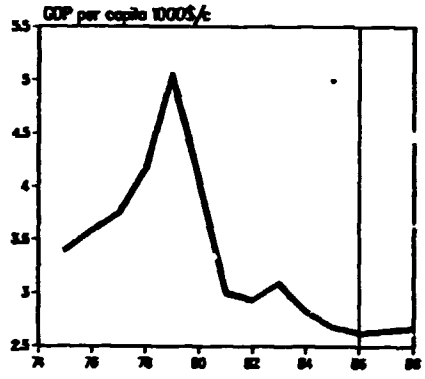


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

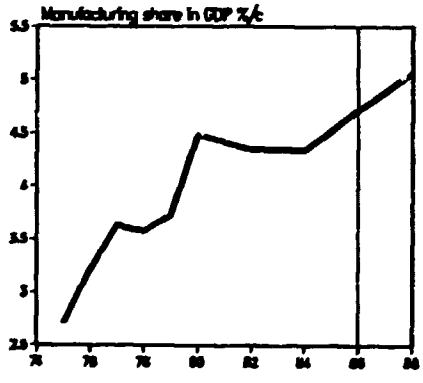


	1975	1980	1985
GDP: /na,c (in million dollars)	37486	53643	42858 /e
Per capita /na,c (in dollars)	3400	4036	2883 /e
Manufacturing share /na,c (%)	2.7	4.5	4.5 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	1019	2403	1929 /e
Value added (in million dollars)	...	...	...
Industrial production index	100	107	127
Gross output (in million dollars)	...	...	...
Employment (in thousands)	133	177	158 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	...	...	...
Wages and salaries (%)	...	...	...
Operating surplus (%)	...	...	...
-PRODUCTIVITY: (in dollars)			
Gross output / worker	...	...	...
Value added / worker	...	...	...
Average wage	..	3714 /e	...
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	9.19 /e	7.93 /e	1.24 /e
in percentage of θ in 1970-1975	123 /e	106 /e	17 /e
Growth rate / structural change	1.07 /e	-2.33 /e	1.81 /e
Degree of specialization	13.8 /e	13.6 /e	13.9 /e
-VALUE ADDED: (in million dollars)			
311 Food products	...	...	...
313 Beverages	...	...	...
314 Tobacco products	...	...	...
321 Textiles	...	...	...
322 Wearing apparel	...	...	...
323 Leather and fur products	...	...	...
324 Footwear	...	...	...
331 Wood and wood products	...	...	...
332 Furniture and fixtures	...	...	...
341 Paper and paper products	...	...	...
342 Printing and publishing	...	...	...
351 Industrial chemicals	...	...	...
352 Other chemical products	...	...	..
353 Petroleum refineries	...	...	...
354 Miscellaneous petroleum and coal products	...	...	...
355 Rubber products	...	...	...
356 Plastic products	...	...	...
361 Pottery, china and earthenware	...	...	...
362 Glass and glass products	...	...	...
369 Other non-metal mineral products	...	...	...
371 Iron and steel	...	...	...
372 Non-ferrous metals	...	...	...
381 Metal products	...	...	...
382 Non-electrical machinery	...	...	...
383 Electrical machinery	...	...	...
384 Transport equipment	...	...	...
385 Professional and scientific equipment	...	...	...
390 Other manufacturing industries	...	...	...

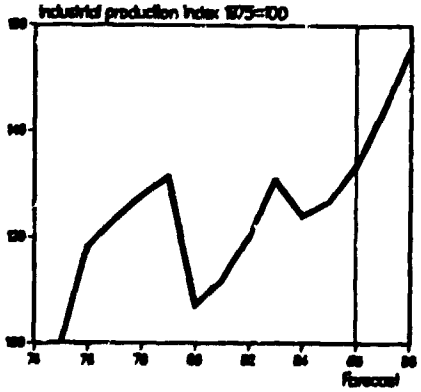
GDP per capita 1000$/c



Manufacturing share in GDP %/c

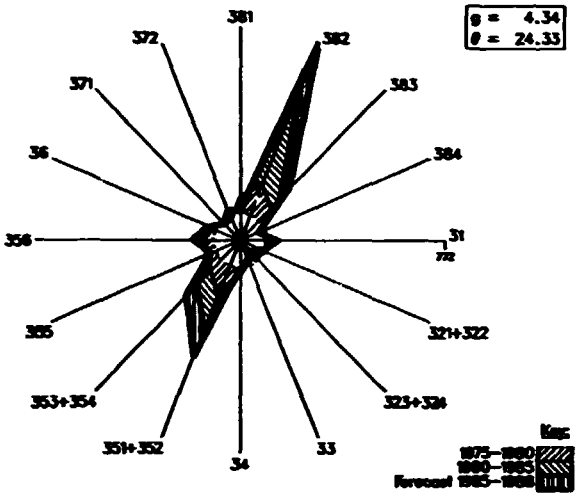


Industrial production index 1975=100

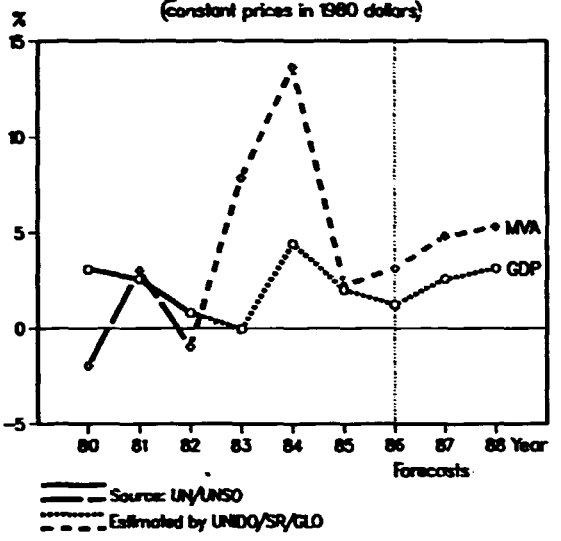


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

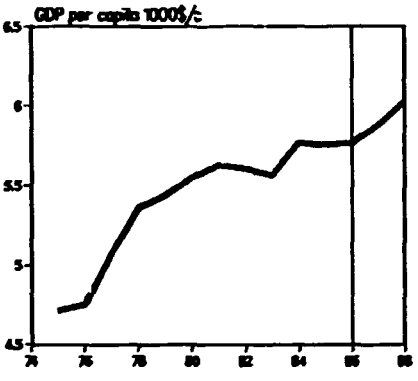


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



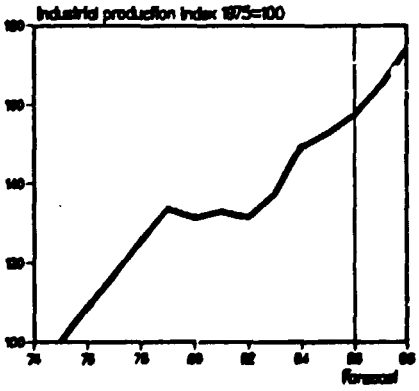
	1975	1980	1985	
GDP: /na,c (in million dollars)	15114	18886	20784	
Per capita /na,c (in dollars)	4714	5653	5780	
Manufacturing share /na,c (%)	19.6	21.2	24.6	
MANUFACTURING:				
Value added /na,c (in million dollars)	2966	4008	5123	
Value added (in million dollars)	2295	5701	6483	
Industrial production index	100	132	153	
Gross output (in million dollars)	6740	15907	15974	/e
Employment (in thousands)	194	225	189	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	66	64	59	/e
Wages and salaries (%)	16	16	16	/e
Operating surplus (%)	18	20	25	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	34796	70625	84485	/e
Value added / worker	11850	25381	34544	/e
Average wage	5453	11071	13180	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	4.05	3.85	1.43	
in percentage of θ in 1970-1975	145	138	51	
Growth rate / structural change	-1.28	-0.41	1.56	
Degree of specialization	16.6	16.0	18.8	
-VALUE ADDED: (in million dollars)				
311 Food products	603	1264	1304	
313 Beverages	189	325	311	
314 Tobacco products	44	83	76	
321 Textiles	142	286	218	
322 Wearing apparel	85	147	127	
323 Leather and fur products	20	28	16	
324 Footwear	24	42	24	
331 Wood and wood products	36	93	87	/e
332 Furniture and fixtures	20	59	38	/e
341 Paper and paper products	59	105	86	/e
342 Printing and publishing	104	265	216	
351 Industrial chemicals	59	236	337	/e
352 Other chemical products	133	536	764	/e
353 Petroleum refineries	10	22	19	/e
354 Miscellaneous petroleum and coal products	-	-	-	/e
355 Rubber products	26	52	64	/e
356 Plastic products	37	113	140	/e
361 Pottery, china and earthenware	16	28	28	/e
362 Glass and glass products	43	109	94	/e
369 Other non-metal mineral products	136	322	286	/e
371 Iron and steel	26	31	31	/e
372 Non-ferrous metals	9	16	16	/e
381 Metal products	101	336	376	/e
382 Non-electrical machinery	97	476	1084	
383 Electrical machinery	91	311	367	
384 Transport equipment	114	190	186	
385 Professional and scientific equipment	66	158	226	/e
390 Other manufacturing industries	9	79	76	/e

GDP per capita 1000$/c



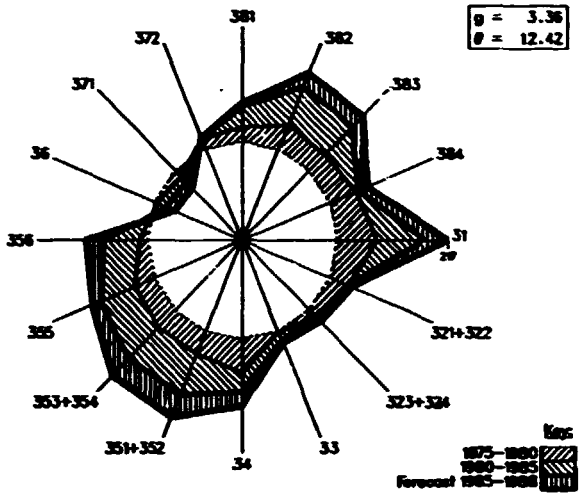
Manufacturing share in GDP %/c

Industrial production index 1975=100

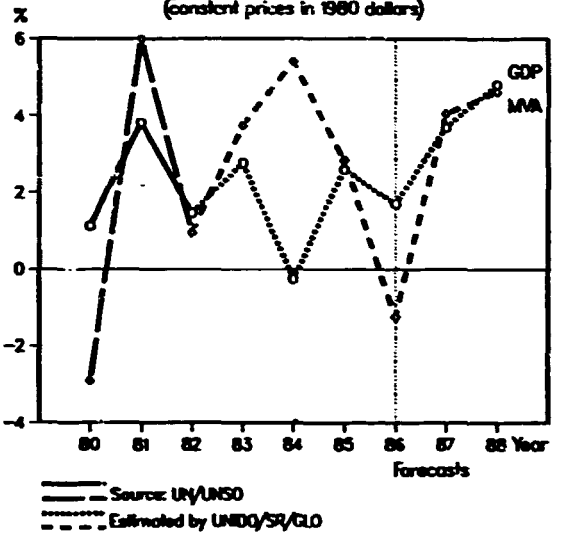


For source, footnotes and comments see "Technical notes" above.

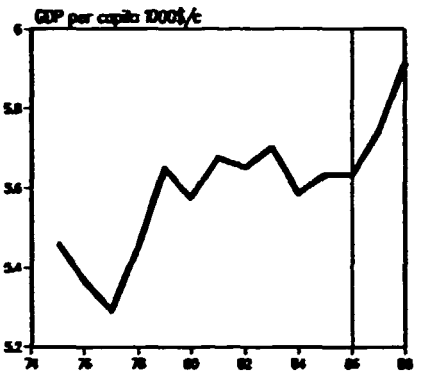
Industrial structural change
(index of value added: 1975=100)

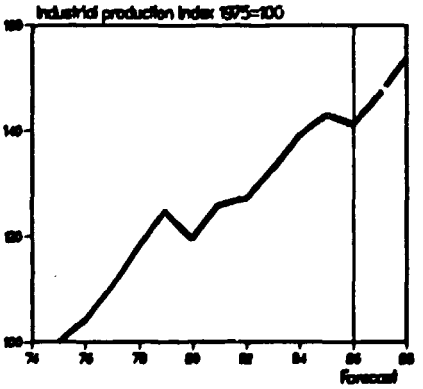


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



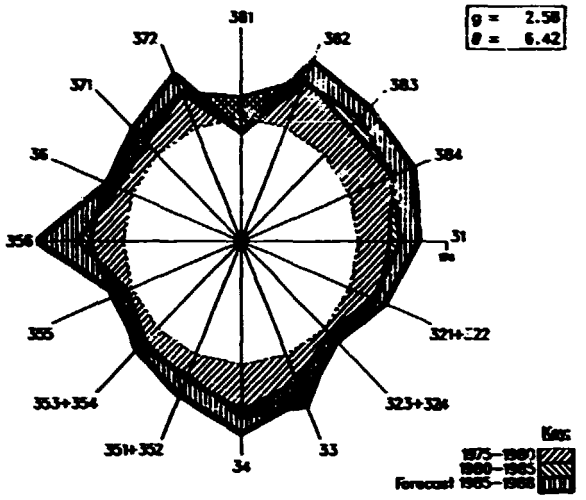
	1975	1980	1985	
GDP: /na,c (in million dollars)	18861	21627	23850	
Per capita /na,c (in dollars)	5459	5577	5533	
Manufacturing share /na,c (%)	16.2	14.9	16.1	
MANUFACTURING:				
Value added /na,c (in million dollars)	3047	3213	3865	
Value added (in million dollars)	3032	5490	8433	
Industrial production index	100	120	143	
Gross output (in million dollars)	7476	14332	12496	/e
Employment (in thousands)	245	259	286	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	59	55	33	/e
Wages and salaries (%)	14	24	16	/e
Operating surplus (%)	26	21	52	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	30529	55422	43648	/e
Value added / worker	12381	25095	29457	/e
Average wage	4388	13433	8822	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.15	1.79	1.45	
in percentage of θ in 1970-1975	95	54	44	
Growth rate / structural change	1.16	-2.27	1.95	
Degree of specialization	12.7	13.7	14.4	
-VALUE ADDED: (in million dollars)				
311 Food products	227	706	972	/e
313 Beverages	70	66	86	/e
314 Tobacco products	83	24	6	/e
321 Textiles	196	422	480	/e
322 Wearing apparel	119	293	341	/e
323 Leather and fur products	7	18	14	/e
324 Footwear	18	38	73	/e
331 Wood and wood products	68	112	129	/e
332 Furniture and fixtures	49	90	117	/e
341 Paper and paper products	84	150	192	/e
342 Printing and publishing	101	184	272	/e
351 Industrial chemicals	130	292	374	/e
352 Other chemical products	132	250	321	/e
353 Petroleum refineries	33	75	99	/e
354 Miscellaneous petroleum and coal products	33	75	99	/e
355 Rubber products	49	104	98	/e
356 Plastic products	88	212	271	/e
361 Pottery, china and earthenware	22	26	20	/e
362 Glass and glass products	26	30	33	/e
369 Other non-metal mineral products	156	239	233	/e
371 Iron and steel	53	148	151	/e
372 Non-ferrous metals	56	61	45	/e
381 Metal products	371	1060	1400	/e
382 Non-electrical machinery	161	245	251	/e
383 Electrical machinery	314	831	1517	/e
384 Transport equipment	279	616	882	/e
385 Professional and scientific equipment	27	66	91	/e
390 Other manufacturing industries	82	53	66	/e



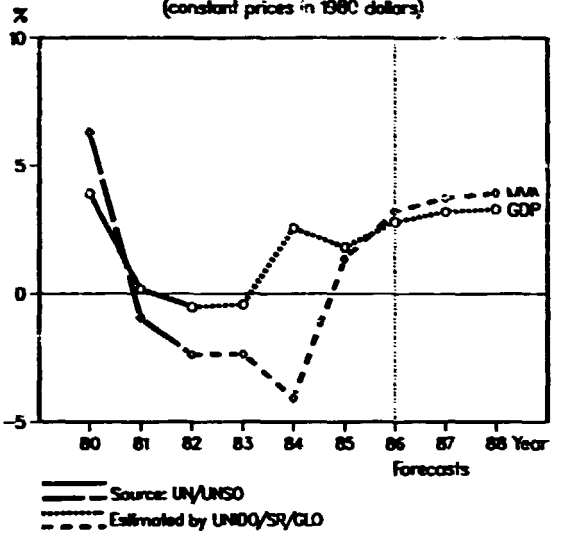


For source, footnotes and comments see "Technical notes" above.

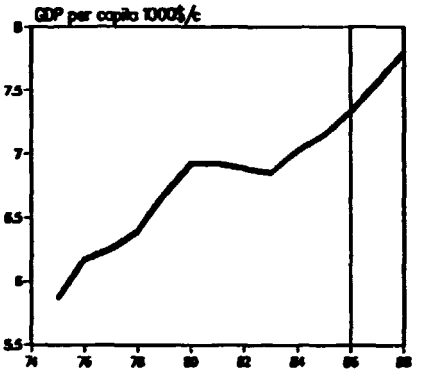
Industrial structural change
(index of value added: 1975=100)

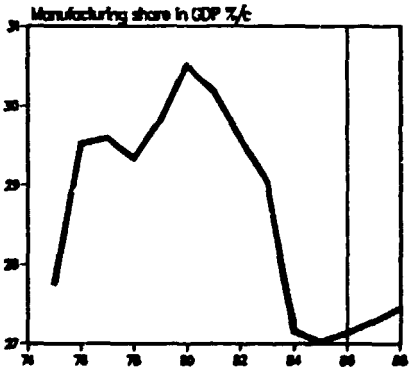


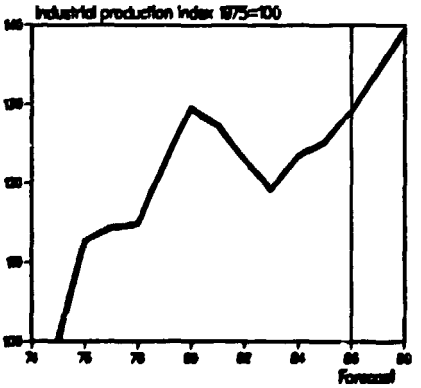
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	327632	386520	409850	
Per capita /na,c (in dollars)	6867	8930	7153	
Manufacturing share /na,c (%)	27.7	30.5	27.0	
MANUFACTURING:				
Value added /na,c (in million dollars)	90882	120677	110788	
Value added (in million dollars)	5 001	97032	76504	
Industrial production index	100	129	125	
Gross output (in million dollars)	122815	250912	213695	/e
Employment (in thousands)	3582	3333	2800	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	58	61	65	/e
Wages and salaries (%)	16	15	13	/e
Operating surplus (%)	25	24	22	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	34287	75281	76328	/e
Value added / worker	14238	29112	26969	/e
Average wage	5663	10926	10230	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	2.56	2.60	2.88	
in percentage of θ in 1970-1975	88	90	100	
Growth rate / structural change	-4.08	2.16	0.47	
Degree of specialization	7.3	7.7	8.2	
-VALUE ADDED: (in million dollars)				
311 Food products	3312	6362	2626	
313 Beverages	1042	1672	1682	
314 Tobacco products	176	307	339	
321 Textiles	3390	6716	4938	
322 Wearing apparel	1619	3137	2672	
323 Leather and fur products	326	718	536	
324 Footwear	680	1495	997	
331 Wood and wood products	573	1318	771	/e
332 Furniture and fixtures	806	1936	1428	/e
341 Paper and paper products	1126	2260	1852	/e
342 Printing and publishing	1695	3017	2729	
351 Industrial chemicals	3682	6983	6001	/e
352 Other chemical products	2465	4439	3064	/e
353 Petroleum refineries	790	1276	869	
354 Miscellaneous petroleum and coal products	49	58	29	/e
355 Rubber products	1022	1832	1241	/e
356 Plastic products	979	1465	1838	/e
361 Pottery, china and earthenware	821	1897	1842	/e
362 Glass and glass products	489	1116	984	
369 Other non-metal mineral products	1743	3667	2363	/e
371 Iron and steel	4307	8364	5436	
372 Non-ferrous metals	741	1315	1013	
381 Metal products	2869	5667	3847	
382 Non-electrical machinery	4851	9325	8628	
383 Electrical machinery	4646	8436	7296	
384 Transport equipment	5525	10280	8760	
385 Professional and scientific equipment	1046	2032	1330	/e
390 Other manufacturing industries	432	871	487	/e

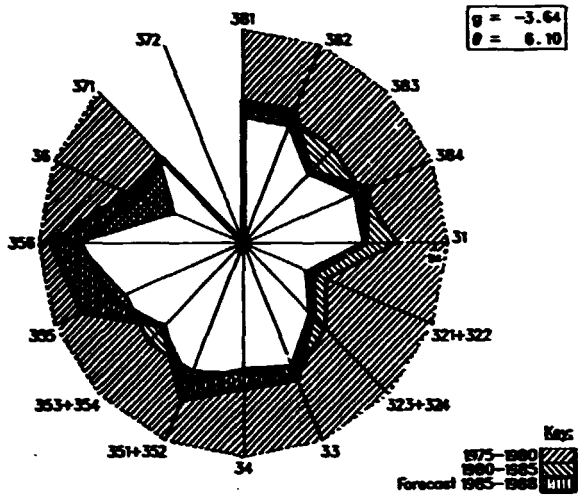




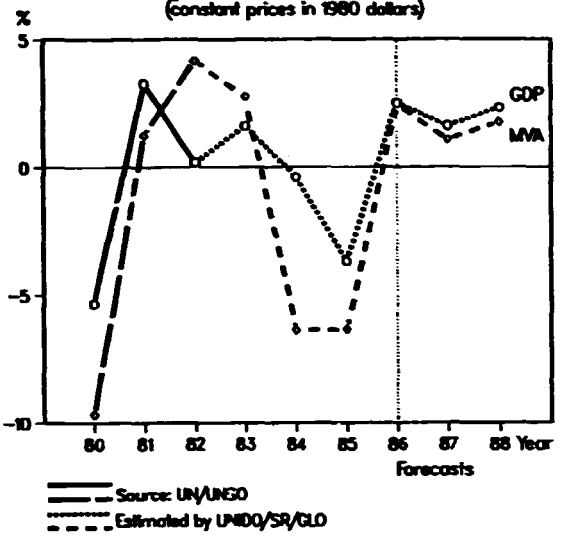


For source, footnotes and comments see "Technical notes" above.

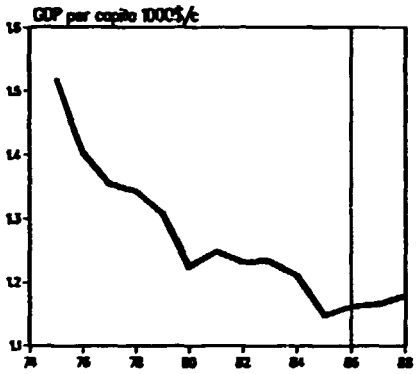
Industrial structural change
(index of value added: 1975=100)

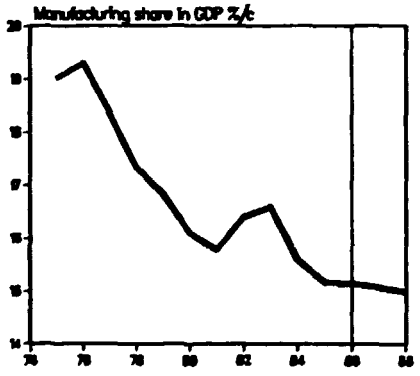


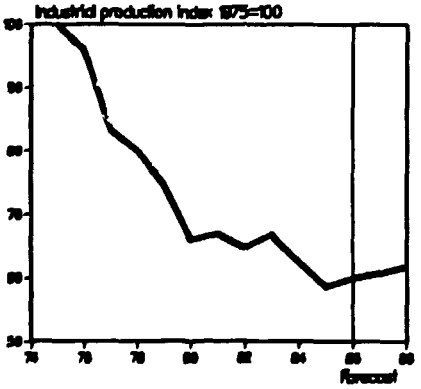
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	3104	2660	2882
Per capita /na,c (in dollars)	1519	1224	1148
Manufacturing share /na,c (%)	19.0	16.1	16.2 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	590	428	407 /e
Value added (in million dollars)	494	445	349 /e
Industrial production index	100	86	59
Gross output (in million dollars)	1363 /e	2256 /e	2202 /e
Employment (in thousands)	53	44	46 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	63 /e	30 /e	84 /e
Wages and salaries (%)	13 /e	7 /e	6 /e
Operating surplus (%)	23 /e	13 /e	10 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	25604 /e	51171 /e	47959 /e
Value added / worker	9349 /e	10239 /e	7597 /e
Average wage	3388 /e	3795 /e	2732 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	3.13 /e	8.36 /e	1.12 /e
in percentage of θ in 1970-1975	62 /e	167 /e	22 /e
Growth rate / structural change	-0.26 /e	-1.40 /e	-5.89 /e
Degree of specialization	17.9 /e	19.1 /e	17.0 /e
-VALUE ADDED: (in million dollars)			
311 Food products	110	78	74 /e
313 Beverages	69	63	45 /e
314 Tobacco products	51	61	47 /e
321 Textiles	4	3	2 /e
322 Wearing apparel	22	15	11 /e
323 Leather and fur products	2	2	2 /e
324 Footwear	12	8	4 /e
331 Wood and wood products	7	3	2 /e
332 Furniture and fixtures	15	12	13 /e
341 Paper and paper products	12	12 /e	12 /e
342 Printing and publishing	16	10 /e	9 /e
351 Industrial chemicals	6 /e	4 /e	2 /e
352 Other chemical products	25 /e	33 /e	33 /e
353 Petroleum refineries	35	55	25 /e
354 Miscellaneous petroleum and coal products	11 /e	8 /e	3 /e
355 Rubber products	2 /e	3 /e	3 /e
356 Plastic products	1 /e	1 /e	1 /e
361 Pottery, china and earthenware	1	1	1 /e
362 Glass and glass products	3	2	3 /e
369 Other non-metal mineral products	17	9	15 /e
371 Iron and steel	2 /e	2 /e	1 /e
372 Non-ferrous metals	- /e	- /e	- /e
381 Metal products	38 /e	38 /e	21 /e
382 Non-electrical machinery	9 /e	9 /e	5 /e
383 Electrical machinery	4 /e	4 /e	2 /e
384 Transport equipment	14 /e	15 /e	8 /e
385 Professional and scientific equipment	- /e	- /e	- /e
390 Other manufacturing industries	5	4	3 /e

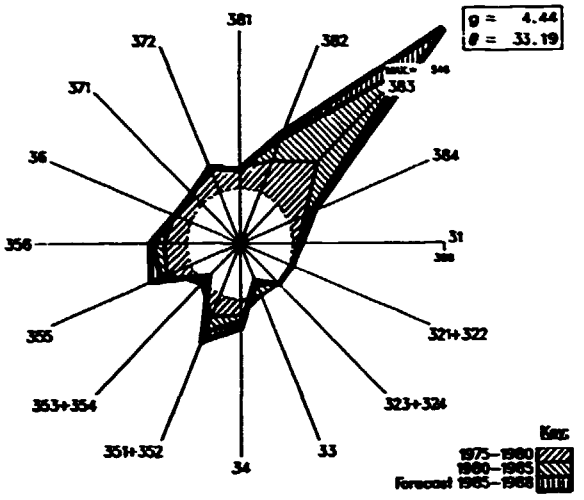




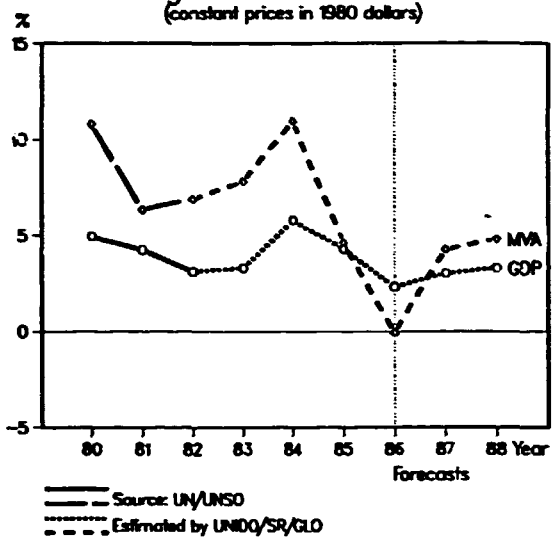


For sources, footnotes and comments see "Technical notes" above.

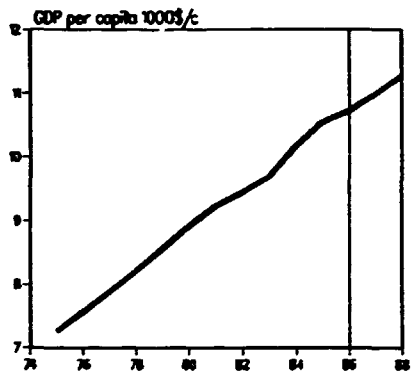
Industrial structural change
(index of value added: 1975=100)

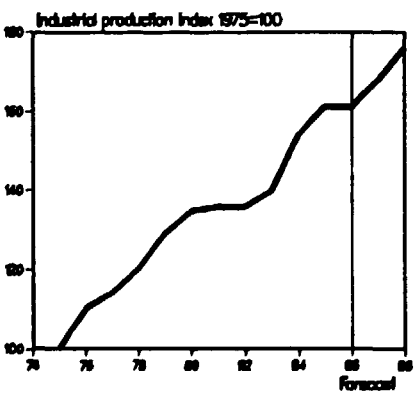


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



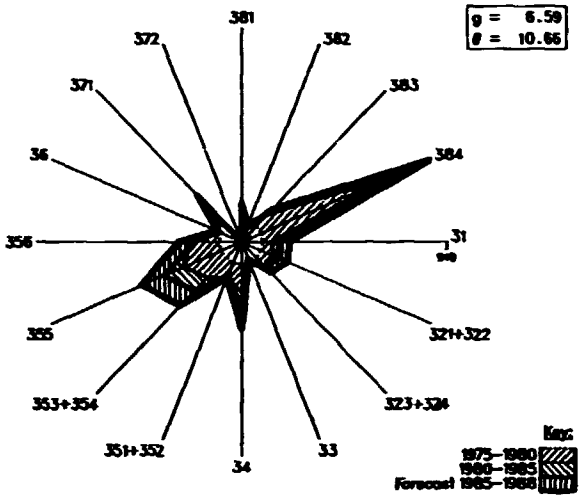
	1975	1980	1985	
GDP: /na,c (in million dollars)	810078	1040456	1273608	
Per capita /na,c (in dollars)	7264	8907	10548	
Manufacturing share /na,c (%)	24.6	30.4	35.3	
MANUFACTURING:				
Value added /na,c (in million dollars)	198884	316142	449444	
Value added (in million dollars)	157038	339234	448265	
Industrial production index	100	135	161	
Gross output (in million dollars)	435794	970569	1126934	/e
Employment (in thousands)	10566	10253	10557	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	64	65	60	/e
Wages and salaries (%)	15	12	13	/e
Operating surplus (%)	21	23	27	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	41249	94662	106746	/e
Value added / worker	14864	33086	42063	/e
Average wage	6009	11522	13997	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	5.15	4.17	2.39	
in percentage of θ in 1970-1975	154	125	72	
Growth rate / structural change	-1.98	1.08	1.94	
Degree of specialization	12.1	13.5	17.9	
-VALUE ADDED: (in million dollars)				
311 Food products	12582	25889	31216	
313 Beverages	2925	5015	5867	
314 Tobacco products	859	1888	2532	
321 Textiles	8814	15436	16533	
322 Wearing apparel	2763	5156	6197	
323 Leather and fur products	458	886	918	
324 Footwear	307	697	704	
331 Wood and wood products	4633	8997	7441	/e
332 Furniture and fixtures	1860	3788	3947	/e
341 Paper and paper products	4902	9310	11191	
342 Printing and publishing	7921	17099	27437	/e
351 Industrial chemicals	7247	13809	14954	/e
352 Other chemical products	7082	15471	22703	/e
353 Petroleum refineries	2082	6620	5190	
354 Miscellaneous petroleum and coal products	566	1063	1167	/e
355 Rubber products	1944	4150	4282	/e
356 Plastic products	4057	9478	12989	/e
361 Pottery, china and earthenware	869	1623	1579	/e
362 Glass and glass products	1314	2876	4021	
369 Other non-metal mineral products	5775	12565	13086	/e
371 Iron and steel	10371	26444	23692	
372 Non-ferrous metals	2756	7458	5878	
381 Metal products	10825	22409	25984	
382 Non-electrical machinery	18595	39270	58042	
383 Electrical machinery	14522	38868	78322	
384 Transport equipment	15930	32107	45224	
385 Professional and scientific equipment	2399	5685	8344	
390 Other manufacturing industries	2631	5178	8627	/e



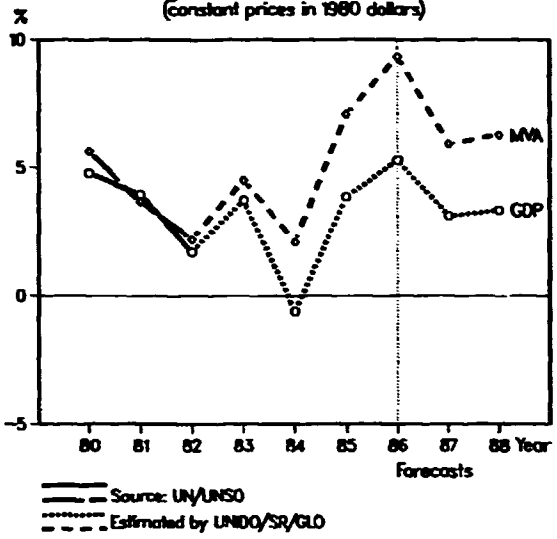


For source, footnotes and comments see "Technical notes" above.

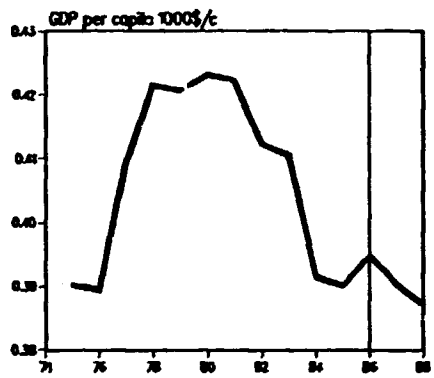
Industrial structural change
(index of value added: 1975=100)

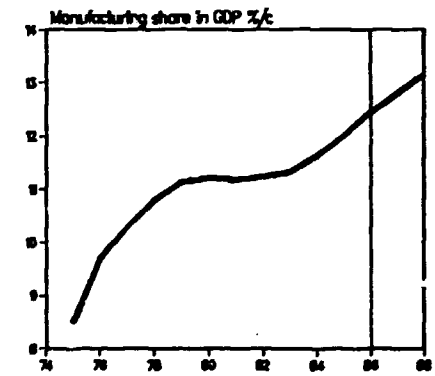


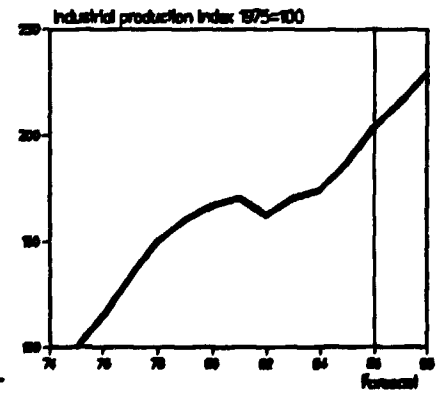
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	5346	7086	8036
Per capita /na,c (in dollars)	390	423	390
Manufacturing share /na,c (%)	8.5	11.2	12.0 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	454	796	963 /e
Value added (in million dollars)	380	887	703 /e
Industrial production index	100	167	186
Gross output (in million dollars)	1665	4634	3983 /e
Employment (in thousands)	120	162	200 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	77 /e	81 /e	82 /e
Wages and salaries (%)	10 /e	8 /e	9 /e
Operating surplus (%)	13 /e	11 /e	9 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	13779 /e	28630 /e	19887 /e
Value added / worker	3161 /e	5482 /e	3509 /e
Average wage	1381 /e	2353 /e	1708 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	6.19	4.04	1.81
in percentage of θ in 1970-1975	156	102	46
Growth rate / structural change	-1.00	1.06	3.93
Degree of specialization	18.3	14.6	17.1
-VALUE ADDED: (in million dollars)			
311 Food products	90	259	191 /e
313 Beverages	31	66	61 /e
314 Tobacco products	13	24	17 /e
321 Textiles	21	58	57 /e
322 Wearing apparel	7	13	20 /e
323 Leather and fur products	2	7	3 /e
324 Footwear	4	13	6 /e
331 Wood and wood products	8	23	15 /e
332 Furniture and fixtures	5	20	10 /e
341 Paper and paper products	12	34	39 /e
342 Printing and publishing	17	28	27 /e
351 Industrial chemicals	13	20	22 /e
352 Other chemical products	21	56	53 /e
353 Petroleum refineries	15	13	10 /e
354 Miscellaneous petroleum and coal products	-	-	- /e
355 Rubber products	12	37	16 /e
356 Plastic products	5	8	6 /e
361 Pottery, china and earthenware	-	-	- /e
362 Glass and glass products	2	3	2 /e
369 Other non-metal mineral products	20	29	13 /e
371 Iron and steel	4 /e	11 /e	8 /e
372 Non-ferrous metals	- /e	- /e	- /e
381 Metal products	20	56	24 /e
382 Non-electrical machinery	3	22	10 /e
383 Electrical machinery	20	40	63 /e
384 Transport equipment	31	46	31 /e
385 Professional and scientific equipment	-	-	- /e
390 Other manufacturing industries	4	4	7 /e

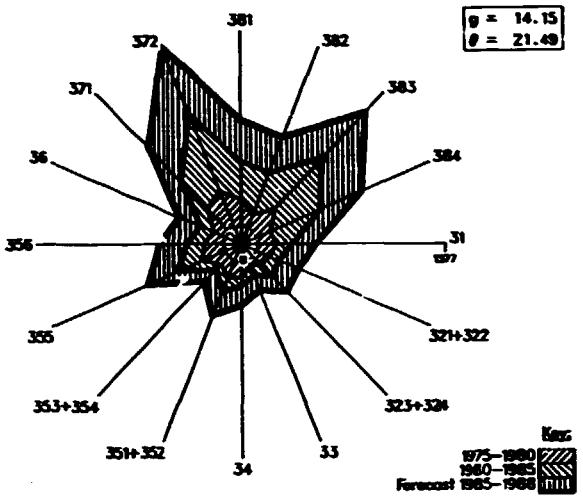




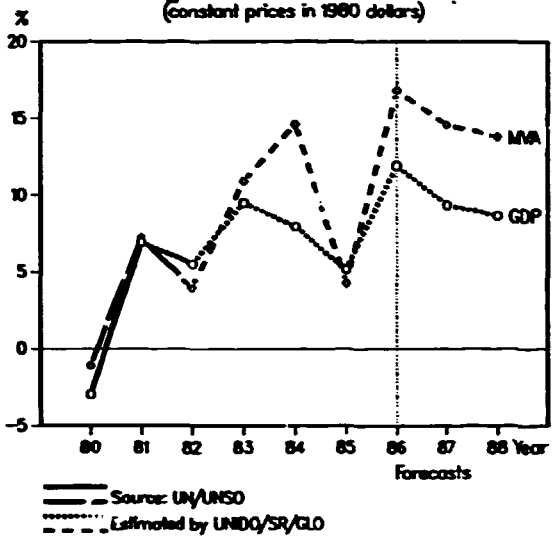


For source, footnotes and comments see "Technical notes" above.

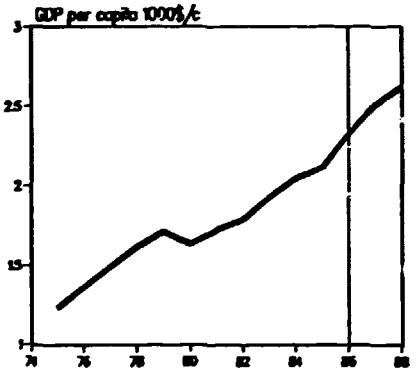
Industrial structural change
(index of value added: 1975=100)

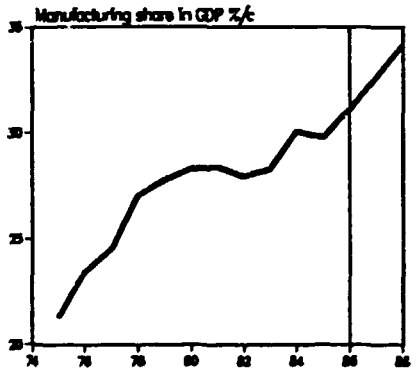


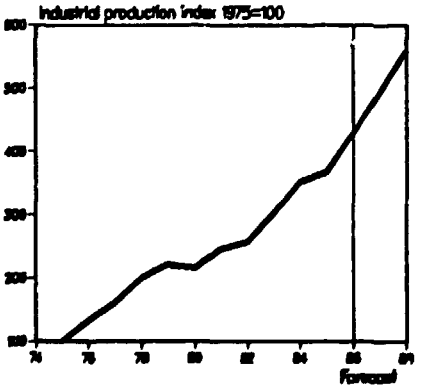
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1988	
GDP: /na,c (in million dollars)	43475	62279	87[illegible]5	
Per capita /na,c (in dollars)	1232	1634	211[illegible]	
Manufacturing share /na,c (%)	21.3	28.3	29.8	
MANUFACTURING:				
Value added /na,c (in million dollars)	9267	17626	26031	
Value added (in million dollars)	5713	19520	30187	
Industrial production index	100	216	367	
Gross output (in million dollars)	16817	59725	84404	/e
Employment (in thousands)	1396	2015	2328	/e
-PROFITABILITY:(in percent of gross output)				
Intermediate input (%)	66	67	64	/e
Wages and salaries (%)	8	10	9	/e
Operating surplus (%)	26	23	27	/e
-PRODUCTIVITY:(in dollars)				
Gross output / worker	12045	29645	36253	/e
Value added / worker	4092	9689	12966	/e
Average wage	964	2837	3282	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	5.51	7.09	0.97	
in percentage of θ in 1970-1975	76	97	13	
Growth rate / structural change	3.30	-0.44	4.36	
Degree-of specialization	10.0	10.4	11.9	
-VALUE ADDED:(in million dollars)				
311 Food products	407	1526	2177	/e
313 Beverages	345	571	799	/e
314 Tobacco products	252	1143	1686	/e
321 Textiles	943	2649	3175	/e
322 Wearing apparel	243	905	1315	/e
323 Leather and fur products	83	138	239	/e
324 Footwear	20	112	268	/e
331 Wood and wood products	138	239	323	/e
332 Furniture and fixtures	15	100	195	/e
341 Paper and paper products	114	426	701	/e
342 Printing and publishing	114	440	745	/e
351 Industrial chemicals	332	998	1377	/e
352 Other chemical products	270	1016	1476	/e
353 Petroleum refineries	417	757	1206	/e
354 Miscellaneous petroleum and coal products	58	211	276	/e
355 Rubber products	143	557	741	/e
356 Plastic products	53	359	540	/e
361 Pottery, china and earthenware	9	89	120	/e
362 Glass and glass products	55	198	243	/e
369 Other non-metal mineral products	280	828	1094	/e
371 Iron and steel	324	1256	2134	/e
372 Non-ferrous metals	46	265	369	/e
381 Metal products	137	636	1259	/e
382 Non-electrical machinery	128	672	1238	/e
383 Electrical machinery	411	1587	3071	/e
384 Transport equipment	231	1152	2574	/e
385 Professional and scientific equipment	43	214	236	/e
390 Other manufacturing industries	110	367	614	/e

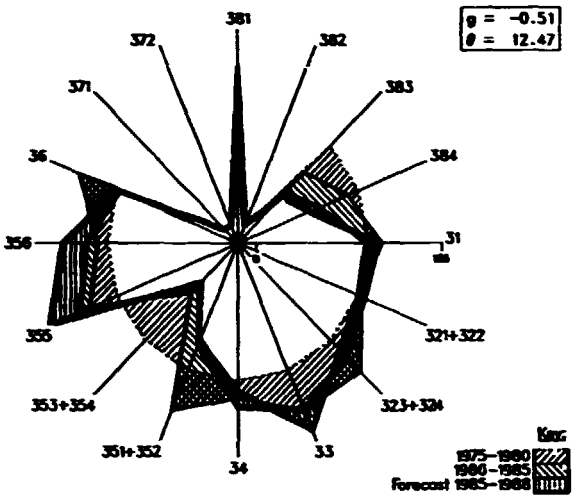




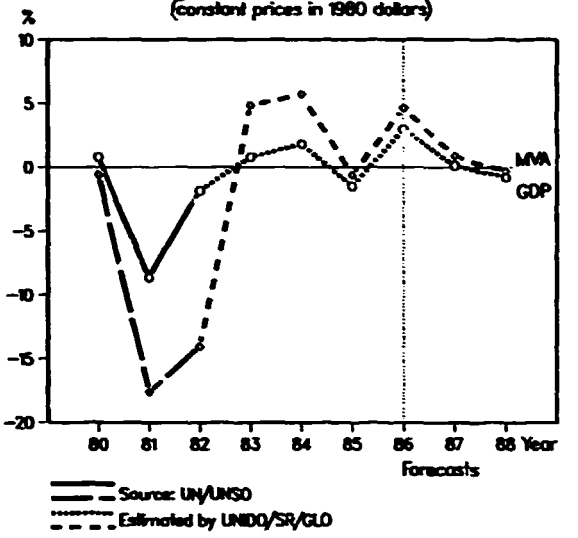


For source, footnotes and comments see "Technical notes" above.

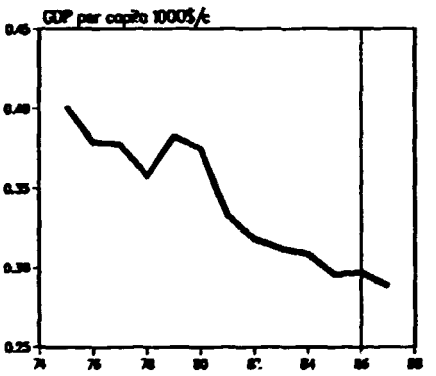
Industrial structural change
(index of value added: 1975=100)

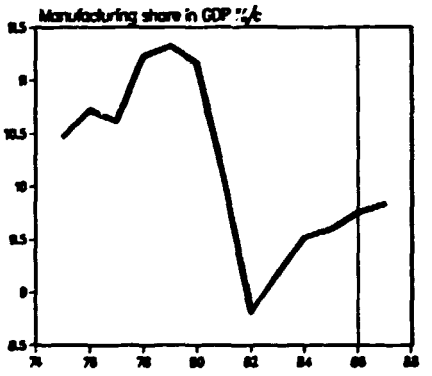


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



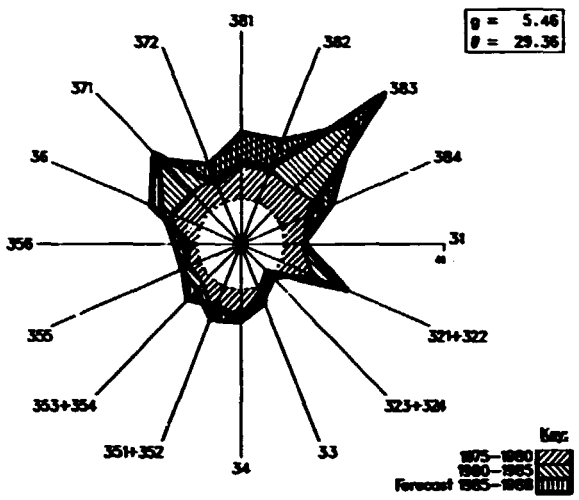
	1975	1980	1985
GDP: /na,c (in million dollars)	3052	3285	2960
Per capita /na,c (in dollars)	401	375	296
Manufacturing share /na,c (%)	10.5	11.2	9.6 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	320	365	284 /e
Value added (in million dollars)	135	221	133 /e
Industrial production index	100	101	89
Gross output (in million dollars)	352	586	199 /e
Employment (in thousands)	42	40 /e	40 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	62	61	33 /e
Wages and salaries (%)	16	15 /e	29 /e
Operating surplus (%)	23	24 /e	38 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	8354	14118 /e	5036 /e
Value added / worker	3197	5483 /e	3361 /e
Average wage	1302	2083 /e	1449 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	5.99 /e	2.52 /e	2.44 /e
in percentage of θ in 1970-1975	94 /e	40 /e	38 /e
Growth rate / structural change	-0.60 /e	-0.50 /e	-0.26 /e
Degree of specialization	23.0 /e	20.9 /e	22.1 /e
-VALUE ADDED: (in million dollars)			
311 Food products	29	23	17 /e
313 Beverages	11	34	13 /e
314 Tobacco products	3	3	2 /e
321 Textiles	36	67	58 /e
322 Wearing apparel	9	19	4 /e
323 Leather and fur products	1	3	- /e
324 Footwear	3	8	5 /e
331 Wood and wood products	2	3	1 /e
332 Furniture and fixtures	-	1	- /e
341 Paper and paper products	5	4	3 /e
342 Printing and publishing	3	6	3 /e
351 Industrial chemicals	1	1	1 /e
352 Other chemical products	9	10	4 /e
353 Petroleum refineries	4	11	8 /e
354 Miscellaneous petroleum and coal products	-	-	- /e
355 Rubber products	1	1	1 /e
356 Plastic products	1	2	1 /e
361 Pottery, china and earthenware	-	-	- /e
362 Glass and glass products	1	2	1 /e
369 Other non-metal mineral products	1	2	1 /e
371 Iron and steel	-	-	- /e
372 Non-ferrous metals	-	-	- /e
381 Metal products	5	9	4 /e
382 Non-electrical machinery	-	-	- /e
383 Electrical machinery	2	3	2 /e
384 Transport equipment	7	7	1 /e
385 Professional and scientific equipment	-	-	- /e
390 Other manufacturing industries	1	3	2 /e



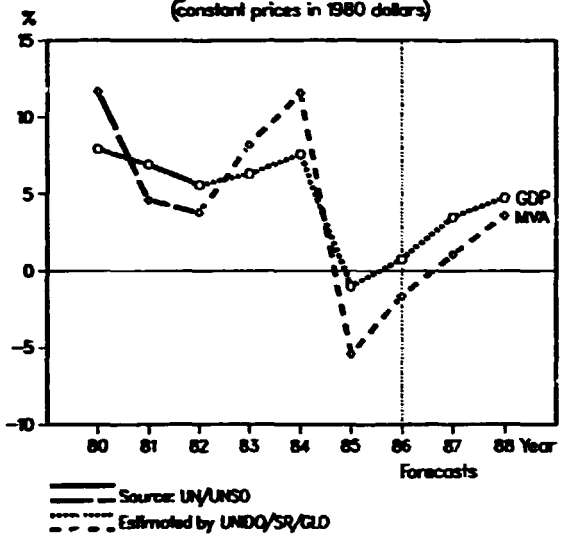


For source, footnotes and comments see "Technical notes" above.

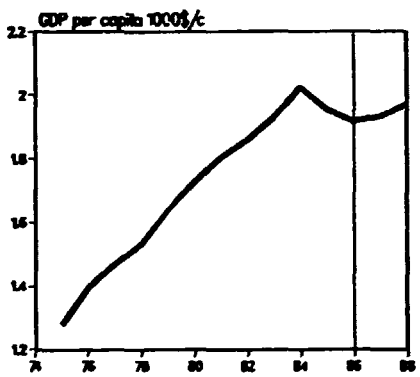
Industrial structural change
(index of value added: 1975=100)

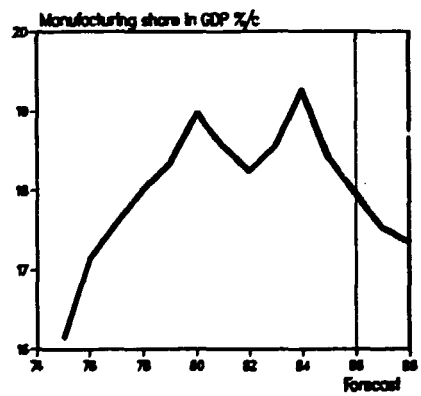


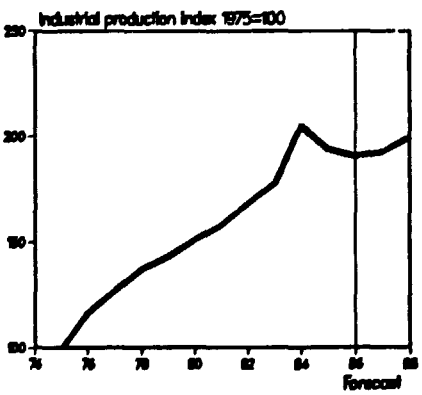
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	...	...	...	
Per capita /na,c (in dollars)	...	...	...	
Manufacturing share /na,c (%)	...	...	...	
MANUFACTURING:				
Value added /na,c (in million dollars)	...	...	...	
Value added (in million dollars)	...	3576	...	
Industrial production index	100	151	194	
Gross output (in million dollars)	...	13748	...	
Employment (in thousands)	286	452	466	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	...	74	...	
Wages and salaries (%)	...	7	...	
Operating surplus (%)	...	19	...	
-PRODUCTIVITY: (in dollars)				
Gross output / worker	...	29741	...	
Value added / worker	...	7735	...	
Average wage	...	2090	...	
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	6.78	2.79	4.06	
in percentage of θ in 1970-1975	129	53	77	
Growth rate / structural change	0.06	1.99	-1.34	
Degree of specialization	16.1	14.8	18.8	
-VALUE ADDED: (in million dollars)				
311 Food products	...	647	...	
313 Beverages	...	100	...	
314 Tobacco products	...	101	...	
321 Textiles	...	184	...	
322 Wearing apparel	...	58	...	
323 Leather and fur products	...	3	...	
324 Footwear	...	10	...	
331 Wood and wood products	...	316	...	
332 Furniture and fixtures	...	29	...	
341 Paper and paper products	...	36	...	
342 Printing and publishing	...	142	...	
351 Industrial chemicals	...	78	...	
352 Other chemical products	...	121	...	
353 Petroleum refineries	...	161	...	
354 Miscellaneous petroleum and coal products	...	2	...	
355 Rubber products	...	296	...	
356 Plastic products	...	69	...	
361 Pottery, china and earthenware	...	10	...	
362 Glass and glass products	...	25	...	
369 Other non-metal mineral products	...	163	...	
371 Iron and steel	...	77	...	
372 Non-ferrous metals	...	25	...	
381 Metal products	...	139	...	
382 Non-electrical machinery	...	120	...	
383 Electrical machinery	...	472	...	
384 Transport equipment	...	146	...	
385 Professional and scientific equipment	...	24	...	
390 Other manufacturing industries	...	21	...	

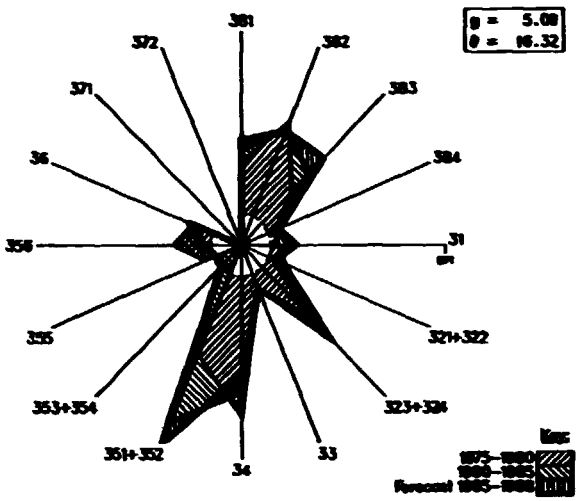




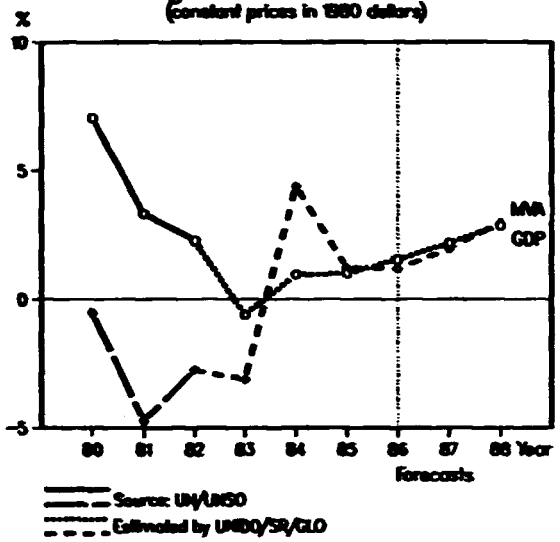


For source, footnotes and comments see "Technical notes" above.

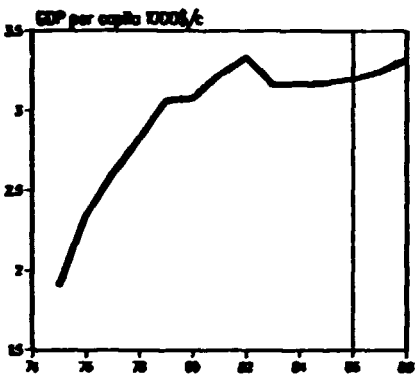
Industrial structural change
(Index of value added: 1975=100)

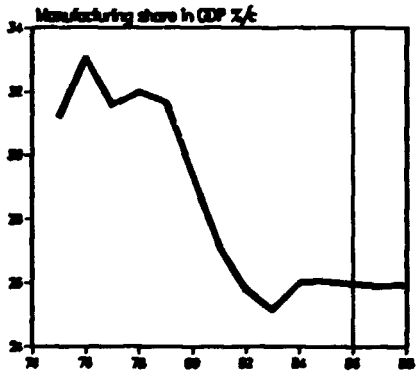


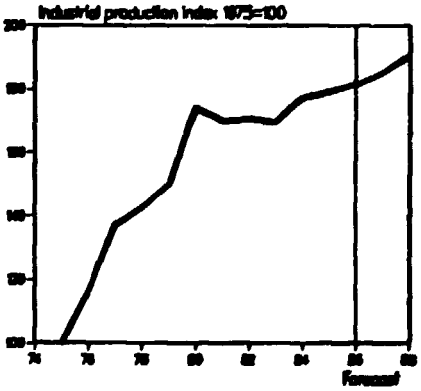
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	858	1136	1217 /e
Per capita /na,c (in dollars)	1902	3079	3176 /e
Manufacturing share /na,c (%)	31.2	29.4	25.1 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	205	334	317 /e
Value added (in million dollars)	104	302	258 /e
Industrial production index	100	174	179
Gross output (in million dollars)	258	705	588 /e
Employment (in thousands)	23	29	24 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	60	57	56 /e
Wages and salaries (%)	20	22	23 /e
Operating surplus (%)	20	21	21 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	11477	24517	24832 /e
Value added / worker	4638	10481	10807 /e
Average wage	2295	5283	5801 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	5.95 /e	7.30 /e	1.58 /e
in percentage of θ in 1970-1975	59 /e	72 /e	16 /e
Growth rate / structural change	1.40 /e	2.21 /e	0.76 /e
Degree of specialization	23.4 /e	16.9 /e	15.7 /e
-VALUE ADDED: (in million dollars)			
311 Food products	9	20	23 /e
313 Beverages	9	20	21 /e
314 Tobacco products	3	8	8 /e
321 Textiles	7	17	7 /e
322 Wearing apparel	30	88	67 /e
323 Leather and fur products	1	4	1 /e
324 Footwear	1	8	10 /e
331 Wood and wood products	1	2	2 /e
332 Furniture and fixtures	5	14	13 /e
341 Paper and paper products	1	2	3 /e
342 Printing and publishing	5	22	11 /e
351 Industrial chemicals	-	1	2 /e
352 Other chemical products	1	5	5 /e
353 Petroleum refineries	-	-	- /e
354 Miscellaneous petroleum and coal products	-	-	- /e
355 Rubber products	5	10	7 /e
356 Plastic products	2	6	4 /e
361 Pottery, china and earthenware	-	1	- /e
362 Glass and glass products	1	2	1 /e
369 Other non-metal mineral products	2	6	9 /e
371 Iron and steel	-	-	- /e
372 Non-ferrous metals	-	-	- /e
381 Metal products	5	14	12 /e
382 Non-electrical machinery	1	5	5 /e
383 Electrical machinery	7	22	29 /e
384 Transport equipment	3	6	4 /e
385 Professional and scientific equipment	1	12	12 /e
390 Other manufacturing industries	2	8	4 /e

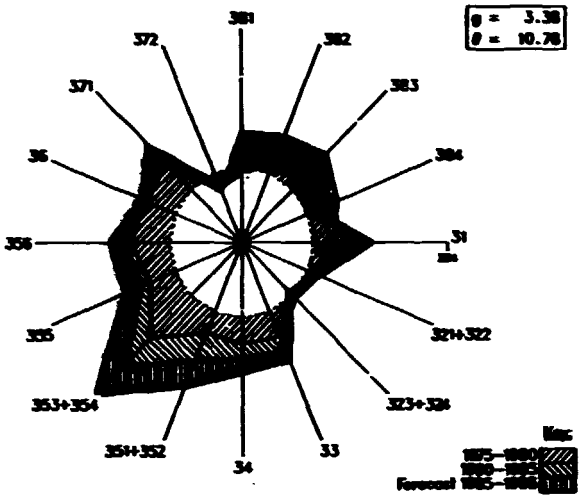




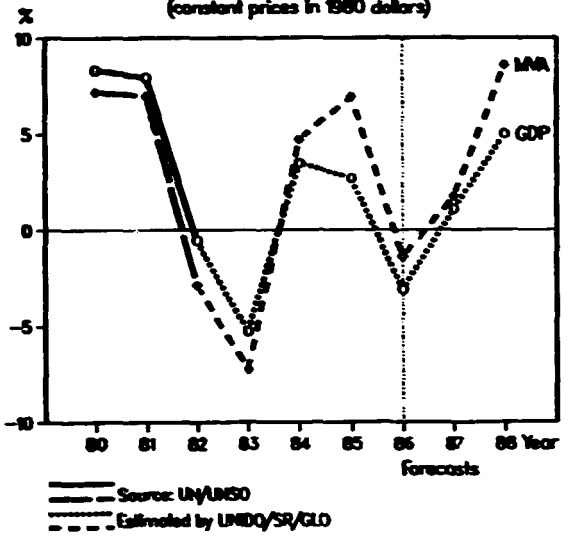


For source, footnotes and comments see "Technical notes" above.

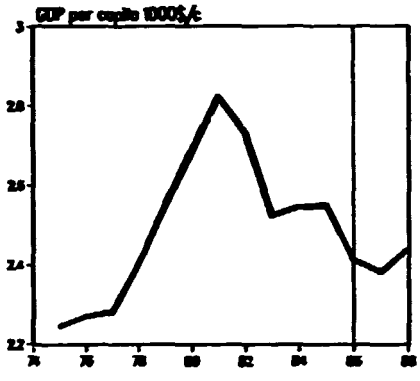
Industrial structural change
(Index of value added: 1975=100)

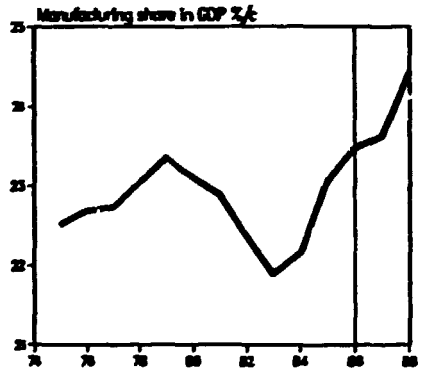


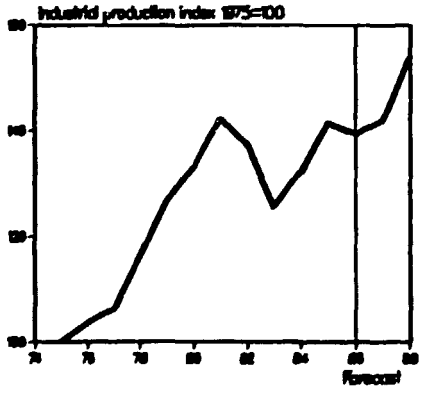
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	135009	185331	201385	
Per capita /na,c (in dollars)	2244	2885	2549	
Manufacturing share /na,c (%)	22.5	23.1	23.1	
MANUFACTURING:				
Value added /na,c (in million dollars)	30389	43048	46444	
Value added (in million dollars)	14575	31644	34765	
Industrial production index	100	133	141	
Gross output (in million dollars)	38621	76087	78150	/e
Employment (in thousands)	1492	1827	1851	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	62	58	55	/e
Wages and salaries (%)	16	15	12	/e
Operating surplus (%)	22	25	33	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	25891	41655	47332	/e
Value added / worker	9771	17257	21050	/e
Average wage	4168	6249	9660	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.10	2.36	1.05	
in percentage of θ in 1970-1975	122	93	41	
Growth rate / structural change	1.44	2.20	5.61	
Degree of specialization	11.0	10.5	12.2	
-VALUE ADDED: (in million dollars)				
311 Food products	1611	2712	2725	/e
313 Beverages	985	1774	1737	/e
314 Tobacco products	317	633	780	/e
321 Textiles	991	1922	1837	/e
322 Wearing apparel	310	603	616	/e
323 Leather and fur products	85	131	138	/e
324 Footwear	138	284	198	/e
331 Wood and wood products	169	464	382	/e
332 Furniture and fixtures	122	308	193	/e
341 Paper and paper products	439	933	935	/e
342 Printing and publishing	355	832	900	/e
351 Industrial chemicals	761	1585	2185	/e
352 Other chemical products	1119	2172	2543	/e
353 Petroleum refineries	981	2450	5785	/e
354 Miscellaneous petroleum and coal products	53	105	215	/e
355 Rubber products	284	588	843	/e
356 Plastic products	288	744	778	/e
361 Pottery, china and earthenware	56	112	121	/e
362 Glass and glass products	211	498	489	/e
369 Other non-metal mineral products	494	1015	877	/e
371 Iron and steel	941	2084	2520	/e
372 Non-ferrous metals	288	722	642	/e
381 Metal products	877	1953	1686	/e
382 Non-electrical machinery	589	1654	1144	/e
383 Electrical machinery	843	1888	1508	/e
384 Transport equipment	1037	2862	2418	/e
385 Professional and scientific equipment	88	209	249	/e
390 Other manufacturing industries	122	347	380	/e

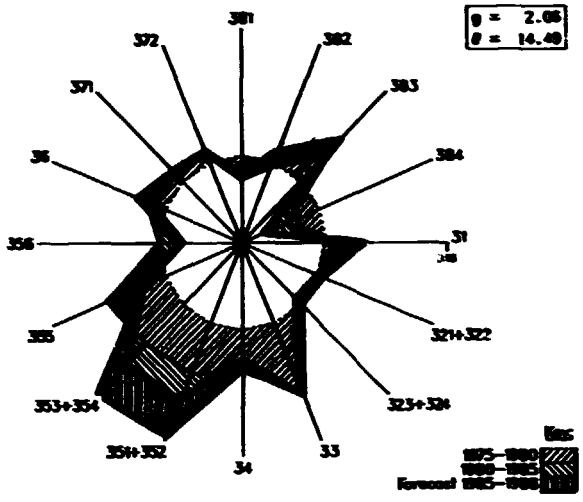




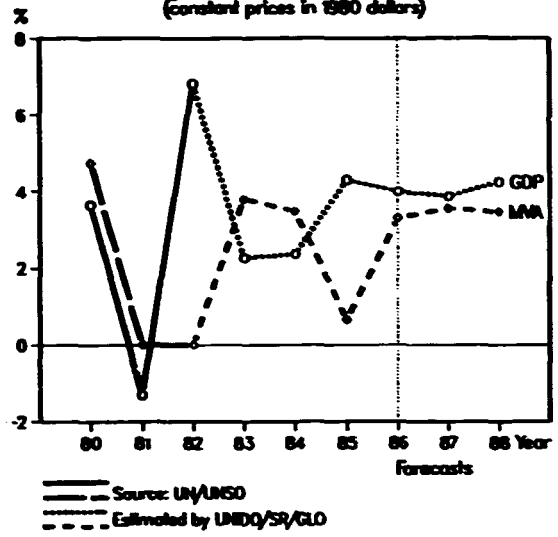


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

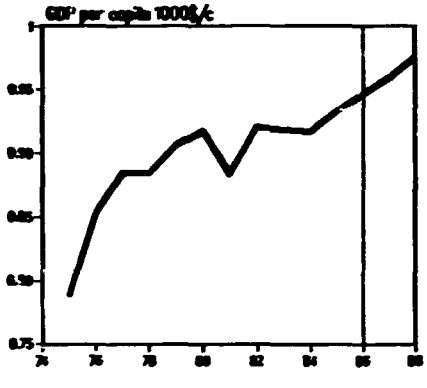


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

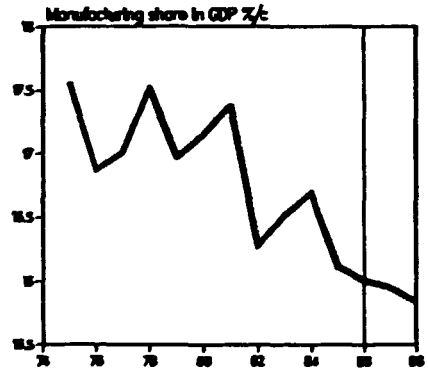


	1975	1980	1985
GDP: /na,c (in million dollars)	13628	17785	20472
Per capita /na,c (in dollars)	788	918	933
Manufacturing share /na,c (%)	17.6	17.2	16.1
MANUFACTURING:			
Value added /na,c (in million dollars)	2393	3051	3299
Value added (in million dollars)	861 /e	1724	1119 /e
Industrial production index	100	115	118
Gross output (in million dollars)	3173 /e	7352	4314 /e
Employment (in thousands)	151 /e	193	176 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	73 /e	77	74 /e
Wages and salaries (%)	13 /e	12	12 /e
Operating surplus (%)	14 /e	12	14 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	21064 /e	38057	24564 /e
Value added / worker	5646 /e	8825	6371 /e
Average wage	2538 /e	4511	2883 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	2.91 /e	3.05 /e	1.32 /e
in percentage of θ in 1970-1975	96 /e	101 /e	44 /e
Growth rate / structural change	0.67 /e	0.37 /e	0.49 /e
Degree of specialization	23.6 /e	21.7 /e	23.9 /e
-VALUE ADDED: (in million dollars)			
311 Food products	187 /e	304	214 /e
313 Beverages	41 /e	62	45 /e
314 Tobacco products	24 /e	38	28 /e
321 Textiles	101 /e	202	147 /e
322 Wearing apparel	17 /e	32	18 /e
323 Leather and fur products	6 /e	15	10 /e
324 Footwear	9 /e	24	16 /e
331 Wood and wood products	16 /e	30	20 /e
332 Furniture and fixtures	4 /e	19	8 /e
341 Paper and paper products	30 /e	64	38 /e
342 Printing and publishing	20 /e	28	19 /e
351 Industrial chemicals	18 /e	127	87 /e
352 Other chemical products	49 /e	97	65 /e
353 Petroleum refineries	66 /e	179	107 /e
354 Miscellaneous petroleum and coal products	- /e	-	- /e
355 Rubber products	23 /e	34	20 /e
356 Plastic products	9 /e	20	10 /e
361 Pottery, china and earthenware	1 /e	6	3 /e
362 Glass and glass products	2 /e	10	8 /e
369 Other non-metal mineral products	54 /e	164	99 /e
371 Iron and steel	4 /e	7	5 /e
372 Non-ferrous metals	3 /e	8	3 /e
381 Metal products	73 /e	110	72 /e
382 Non-electrical machinery	22 /e	30	19 /e
383 Electrical machinery	32 /e	61	31 /e
384 Transport equipment	36 /e	62	21 /e
385 Professional and scientific equipment	1 /e	1	1 /e
390 Other manufacturing industries	2 /e	2	1 /e

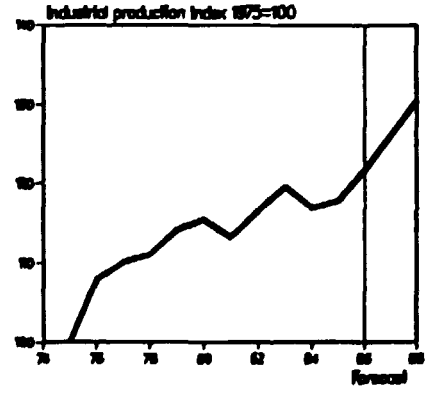
GDP per capita 1000$/c



Manufacturing share in GDP %/c

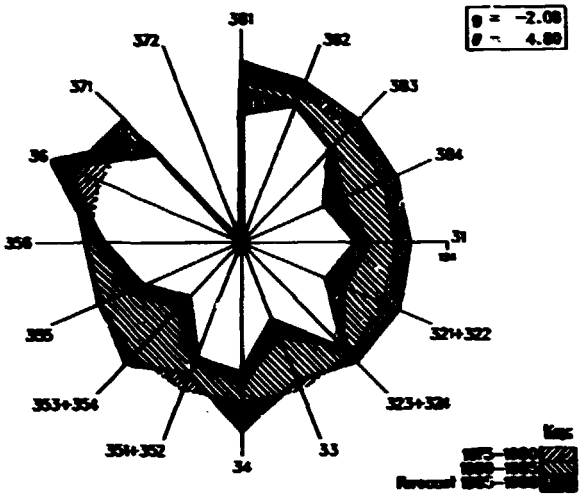


Industrial production index 1975=100

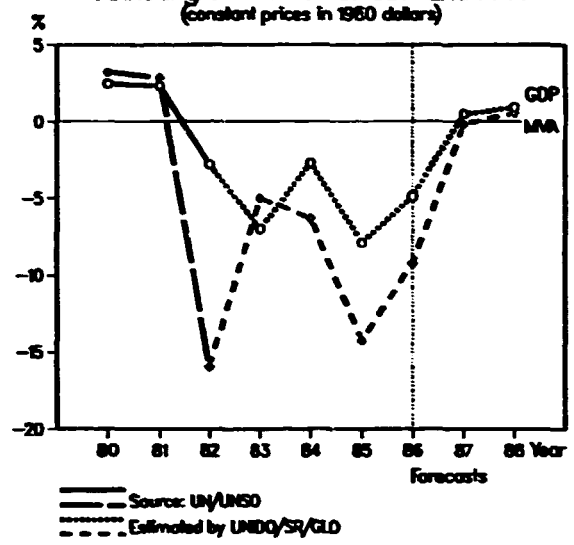


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

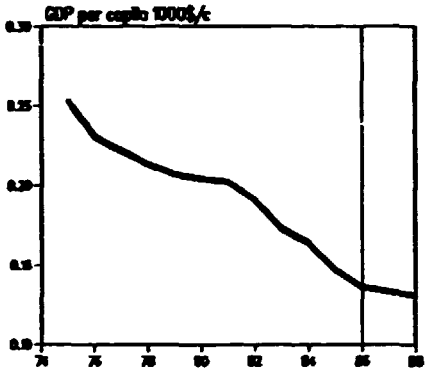


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

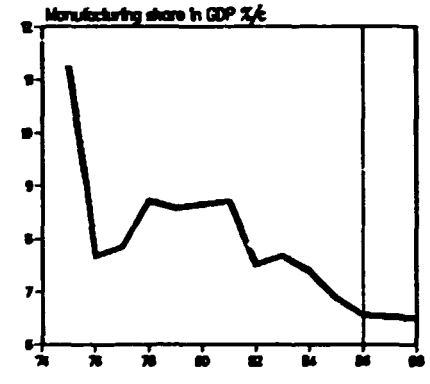


	1975	1980	1985
GDP: /ma,c (in million dollars)	2464	2477	2053
Per capita /ma,c (in dollars)	253	204	147
Manufacturing share /ma,c (%)	11.3	8.6	6.9 /e
MANUFACTURING:			
Value added /ma,c (in million dollars)	277	214	141 /e
Value added (in million dollars)	...	...	...
Industrial production index	100	108	84
Gross output (in million dollars)	...	...	...
Employment (in thousands)	94 /e	91 /e	92 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	...	...	...
Wages and salaries (%)	...	...	...
Operating surplus (%)	...	...	...
-PRODUCTIVITY: (in dollars)			
Gross output / worker	...	...	...
Value added / worker	...	...	...
Average wage	...	...	...
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	5.90	2.52	1.14
in percentage of θ in 1970-1975	104	44	20
Growth rate / structural change	-3.56	0.21	-12.52
Degree of specialization	20.8	21.1	20.7
-VALUE ADDED: (in million dollars)			
311 Food products	...	...	...
313 Beverages	...	...	...
314 Tobacco products	...	...	...
321 Textiles	...	...	...
322 Wearing apparel	...	...	...
323 Leather and fur products	...	...	...
324 Footwear	...	...	...
331 Wood and wood products	...	...	...
332 Furniture and fixtures	...	...	...
341 Paper and paper products	...	...	...
342 Printing and publishing	...	...	...
351 Industrial chemicals	...	...	...
352 Other chemical products	...	...	...
353 Petroleum refineries	...	...	...
354 Miscellaneous petroleum and coal products	...	...	...
355 Rubber products	...	...	...
356 Plastic products	...	...	...
361 Pottery, china and earthenware	...	...	...
362 Glass and glass products	...	...	...
369 Other non-metal mineral products	...	...	...
371 Iron and steel	...	...	...
372 Non-ferrous metals	...	...	...
381 Metal products	...	...	...
382 Non-electrical machinery	...	...	...
383 Electrical machinery	...	...	...
384 Transport equipment	...	...	...
385 Professional and scientific equipment	...	...	...
390 Other manufacturing industries	...	...	...

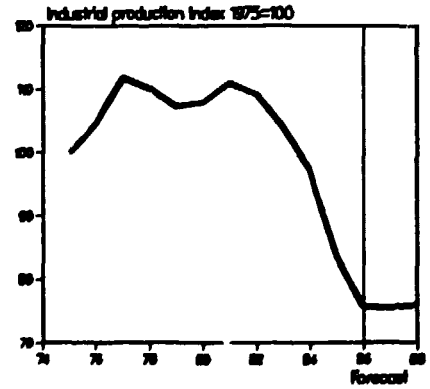
GDP per capita 1000$/c



Manufacturing share in GDP %/c

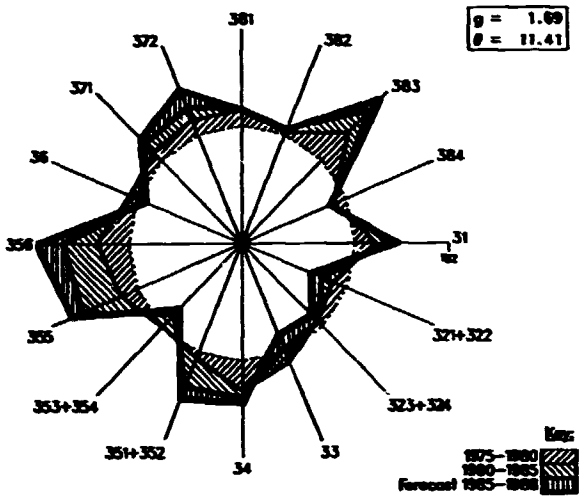


Industrial production index 1975=100

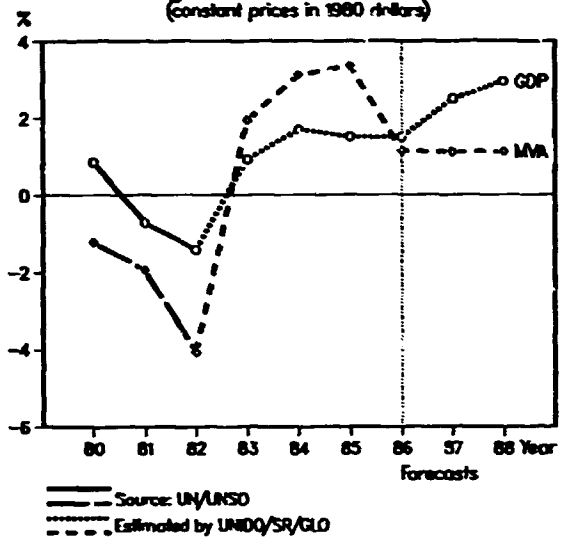


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

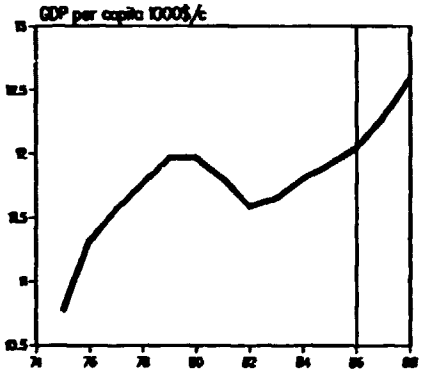


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



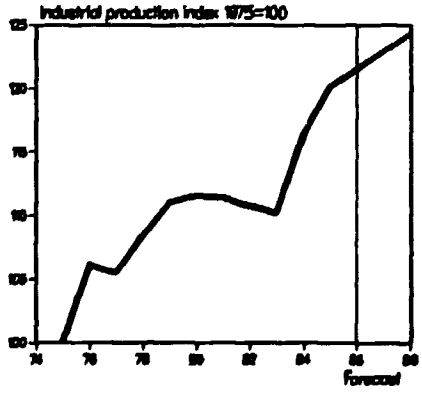
	1975	1980	1985	
GDP: /na,c (in million dollars)	148507	169386	172811	
Per capita /na,c (in dollars)	10766	11971	11918	
Manufacturing share /na,c (%)	20.5	17.9	18.0	
MANUFACTURING:				
Value added /na,c (in million dollars)	30437	30362	31033	
Value added (in million dollars)	18139	29190	22155	
Industrial production index	100	112	120	
Gross output (in million dollars)	60502	109617	80676	/e
Employment (in thousands)	1027	945	821	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	70	73	73	/e
Wages and salaries (%)	17	15	14	/e
Operating surplus (%)	13	11	13	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	58912	115997	98220	/e
Value added / worker	17662	30889	26973	/e
Average wage	10079	17892	13749	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.28	1.42	1.68	
in percentage of θ in 1970-1975	129	56	66	
Growth rate / structural change	-1.52	0.34	1.87	
Degree of specialization	14.1	15.0	15.8	
-VALUE ADDED: (in million dollars)				
311 Food products	2705	4562	3459	
313 Beverages	372	554	494	
314 Tobacco products	198	282	225	
321 Textiles	525	734	506	
322 Wearing apparel	251	372	199	
323 Leather and fur products	43	68	57	
324 Footwear	59	118	61	
331 Wood and wood products	395	594	405	/e
332 Furniture and fixtures	251	418	307	/e
341 Paper and paper products	455	805	700	/e
342 Printing and publishing	1214	2480	1755	
351 Industrial chemicals	1783	2329	1901	/e
352 Other chemical products	597	941	618	/e
353 Petroleum refineries	380	619	563	
354 Miscellaneous petroleum and coal products	17	15	13	/e
355 Rubber products	103	161	89	/e
356 Plastic products	312	483	383	/e
361 Pottery, china and earthenware	12	15	6	/e
362 Glass and glass products	119	176	107	/e
369 Other non-metal mineral products	621	1081	641	/e
371 Iron and steel	514	734	675	/e
372 Non-ferrous metals	245	518	501	/e
381 Metal products	1499	2456	1889	/e
382 Non-electrical machinery	1888	2269	173	
383 Electrical machinery	2092	3687	3116	
384 Transport equipment	1286	1927	1279	
385 Professional and scientific equipment	233	382	368	/e
390 Other manufacturing industries	71	211	174	/e

GDP per capita 1000$/c



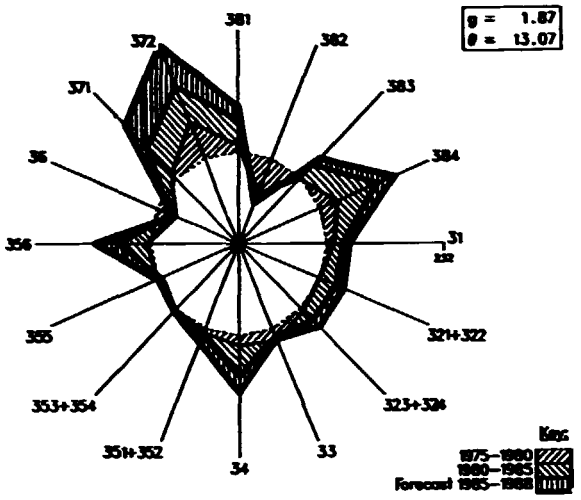
Manufacturing share in GDP %/c

Industrial production index 1975=100

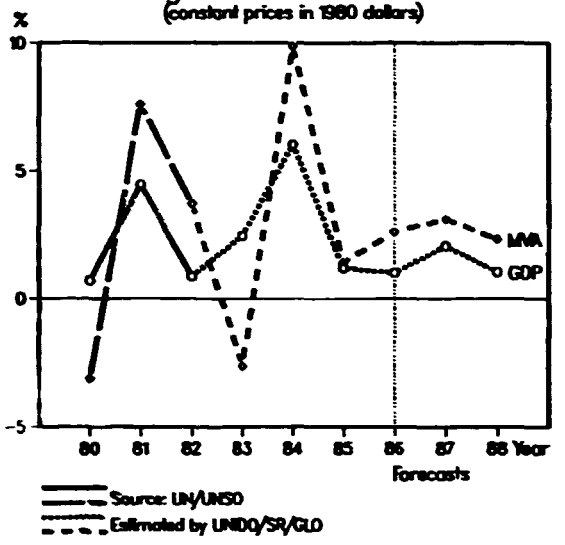


For source, footnotes and comments see "Technical notes" above.

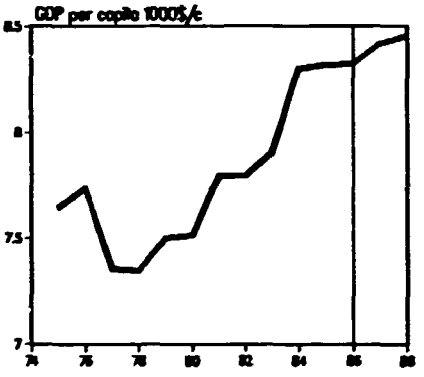
Industrial structural change
(index of value added: 1975=100)

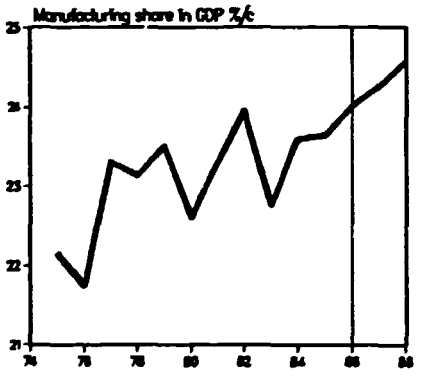


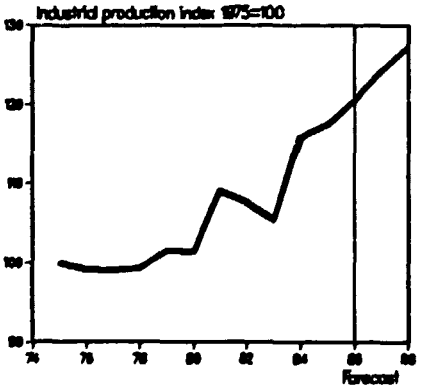
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	23697	23818	27692	
Per capita /na,c (in dollars)	7644	7516	8716	
Manufacturing share /na,c (%)	22.2	22.6	23.6	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	5227	5387	6522	/e
Value added (in million dollars)	2801	4756	4785	/e
Industrial production index	100	101	117	
Gross output (in million dollars)	8717	14791	15536	/e
Employment (in thousands)	268	285	301	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	68	68	69	/e
Wages and salaries (%)	21	21	18	/e
Operating surplus (%)	11	11	13	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	32467	51957	51614	/e
Value added / worker	10435	16711	15895	/e
Average wage	6943	11050	9105	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	1.25	/e 2.82	/e 1.07	/e
in percentage of θ in 1970-1975	43	/e 97	/e 37	/e
Growth rate / structural change	2.01	/e -0.06	/e 1.31	/e
Degree of specialization	14.0	/e 14.1	/e 14.2	/e
-VALUE ADDED: (in million dollars)				
311 Food products	604	1098	1170	/e
313 Beverages	71	110	109	/e
314 Tobacco products	18	30	29	/e
321 Textiles	158	222	210	/e
322 Wearing apparel	114	186	174	/e
323 Leather and fur products	22	45	43	/e
324 Footwear	31	55	50	/e
331 Wood and wood products	168	253	234	/e
332 Furniture and fixtures	56	92	79	/e
341 Paper and paper products	164	286	274	/e
342 Printing and publishing	169	294	284	/e
351 Industrial chemicals	65	140	123	/e
352 Other chemical products	69	155	148	/e
353 Petroleum refineries	11	26	24	/e
354 Miscellaneous petroleum and coal products	5	9	7	/e
355 Rubber products	52	96	42	/e
356 Plastic products	48	110	120	/e
361 Pottery, china and earthenware	7	13	14	/e
362 Glass and glass products	30	44	47	/e
369 Other non-metal mineral products	98	114	177	/e
371 Iron and steel	54	93	75	/e
372 Non-ferrous metals	39	82	125	/e
381 Metal products	228	371	391	/e
382 Non-electrical machinery	132	236	241	/e
383 Electrical machinery	168	239	236	/e
384 Transport equipment	175	318	291	/e
385 Professional and scientific equipment	8	14	19	/e
390 Other manufacturing industries	33	45	47	/e

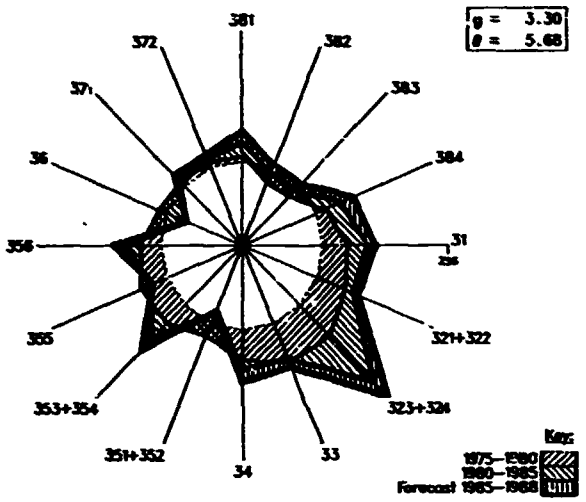




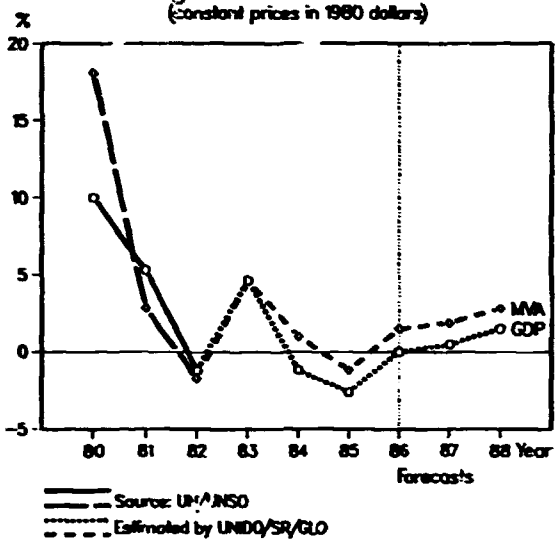


For source, footnotes and comments see "Technical notes" above.

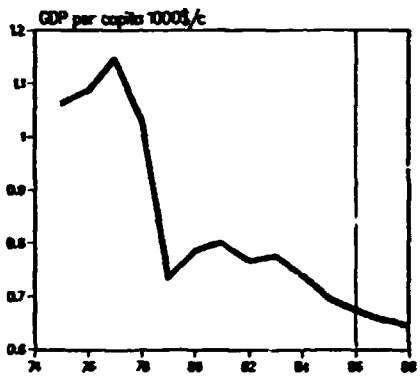
Industrial structural change
(index of value added: 1975=100)

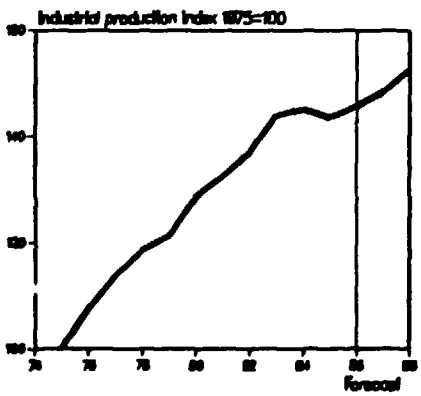


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



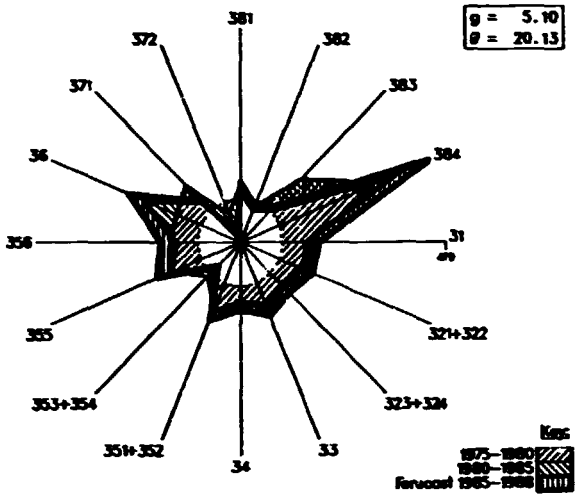
	1975	1980	1985	
GDP: /na,c (in million dollars)	2561	2178	2283	
Per capita /na,c (in dollars)	1063	786	698	
Manufacturing share /na,c (%)	21.7	25.1	25.3	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	555	546	577	/e
Value added (in million dollars)	350	354	1573	/e
Industrial production index	100	129	143	
Gross output (in million dollars)	835	895	2887	/e
Employment (in thousands)	27	34	46	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	58	60	45	/e
Wages and salaries (%)	7	12	11	/e
Operating surplus (%)	35	28	43	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	31440	26364	63270	/e
Value added / worker	13178	10431	34462	/e
Average wage	2045	3040	7036	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.37	1.47	0.36	
in percentage of θ in 1970-1975	117	51	13	
Growth rate / structural change	1.39	4.13	-3.23	
Degree of specialization	31.5	32.0	35.9	
-VALUE ADDED: (in million dollars)				
311 Food products	134	76	298	/e
313 Beverages	31	70	380	/e
314 Tobacco products	14	40	128	/e
321 Textiles	24	14	103	/e
322 Wearing apparel	6	6	31	/e
323 Leather and fur products	3	4	11	/e
324 Footwear	7	6	46	/e
331 Wood and wood products	14	4	11	/e
332 Furniture and fixtures	3	1	6	/e
341 Paper and paper products	4	1	5	/e
342 Printing and publishing	6	6	38	/e
351 Industrial chemicals	18	16	42	/e
352 Other chemical products	13	21	115	/e
353 Petroleum refineries	26	52	157	/e
354 Miscellaneous petroleum and coal products	-	-	5	/e
355 Rubber products	1	2	9	/e
356 Plastic products	6	7	45	/e
361 Pottery, china and earthenware	3	-	2	/e
362 Glass and glass products	1	-	2	/e
369 Other non-metal mineral products	14	10	25	/e
371 Iron and steel	-	-	1	/e
372 Non-ferrous metals	-	-	-	/e
381 Metal products	14	13	89	/e
382 Non-electrical machinery	2	1	4	/e
383 Electrical machinery	4	2	11	/e
384 Transport equipment	1	1	6	/e
385 Professional and scientific equipment	1	1	3	/e
390 Other manufacturing industries	1	1	2	/e



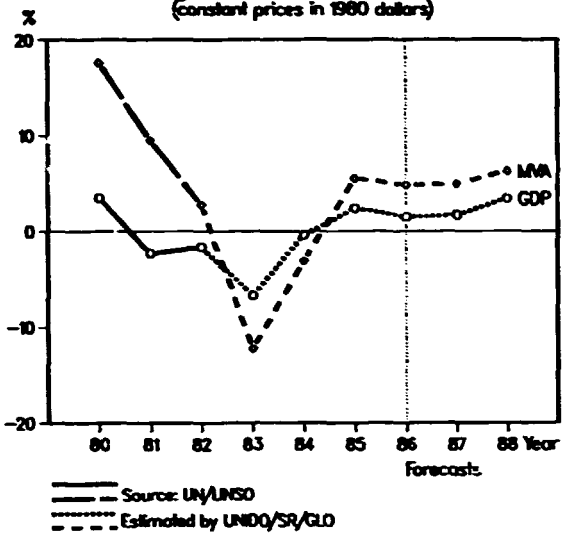


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

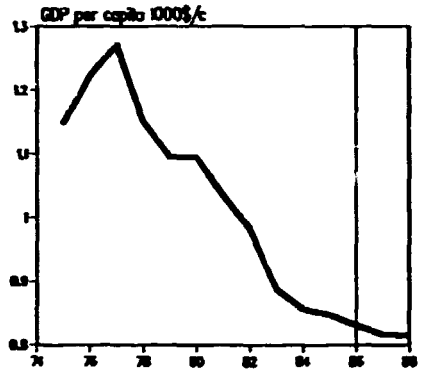


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

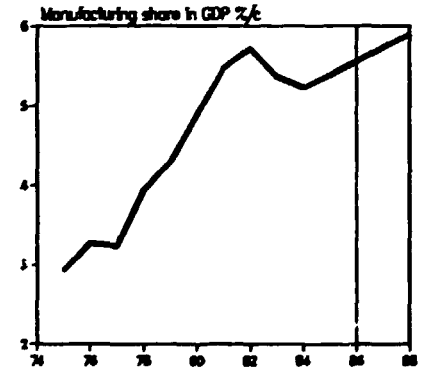


	1975	1980	1985
GDP: /na,c (in million dollars)	77614	88222	80661
Per capita /na,c (in dollars)	1147	1095	847
Manufacturing share /na,c (%)	2.9	4.9	5.4 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	2275	4304	4345 /e
Value added (in million dollars)	1835	5557	10137 /e
Industrial production index	100	169	163
Gross output (in million dollars)	4246	12894	21763 /e
Employment (in thousands)	241	291	313 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	57	56	53 /e
Wages and salaries (%)	9	10	11 /e
Operating surplus (%)	34	34	36 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	17682	43991	69558 /e
Value added / worker	7598	19128	32399 /e
Average wage	1656	4264	7438 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	12.11 /e	11.52 /e	1.65 /e
in percentage of θ in 1970-1975	111 /e	105 /e	15 /e
Growth rate / structural change	2.21 /e	1.05 /e	3.32 /e
Degree of specialization	16.5 /e	20.1 /e	23.8 /e
-VALUE ADDED: (in million dollars)			
311 Food products	325	577	1123 /e
313 Beverages	149	902	1882 /e
314 Tobacco products	60	357	498 /e
321 Textiles	316	612	1177 /e
322 Wearing apparel	5	5	7 /e
323 Leather and fur products	11	21	39 /e
324 Footwear	22	43	67 /e
331 Wood and wood products	50	73	88 /e
332 Furniture and fixtures	21	88	113 /e
341 Paper and paper products	48	94	182 /e
342 Printing and publishing	68	161	289 /e
351 Industrial chemicals	15	36	68 /e
352 Other chemical products	186	728	1286 /e
353 Petroleum refineries	...	...	...
354 Miscellaneous petroleum and coal products	108	290	486 /e
355 Rubber products	64	79	136 /e
356 Plastic products	32	90	175 /e
361 Pottery, china and earthenware	1	1	2 /e
362 Glass and glass products	9	60	118 /e
369 Other non-metal mineral products	90	179	298 /e
371 Iron and steel	2	20	29 /e
372 Non-ferrous metals	15	84	166 /e
381 Metal products	164	363	689 /e
382 Non-electrical machinery	6	61	122 /e
383 Electrical machinery	31	113	224 /e
384 Transport equipment	22	424	842 /e
385 Professional and scientific equipment	-	-	1 /e
390 Other manufacturing industries	16	17	33 /e

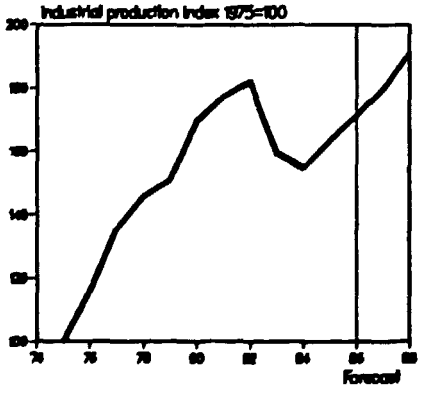
GDP per capita 1000$/c



Manufacturing share in GDP %/c

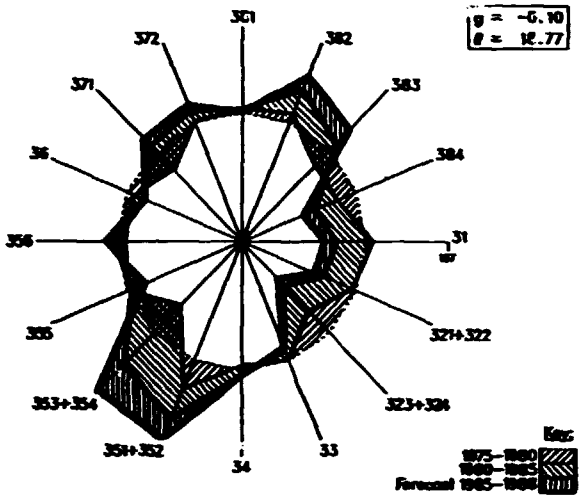


Industrial production index 1975=100

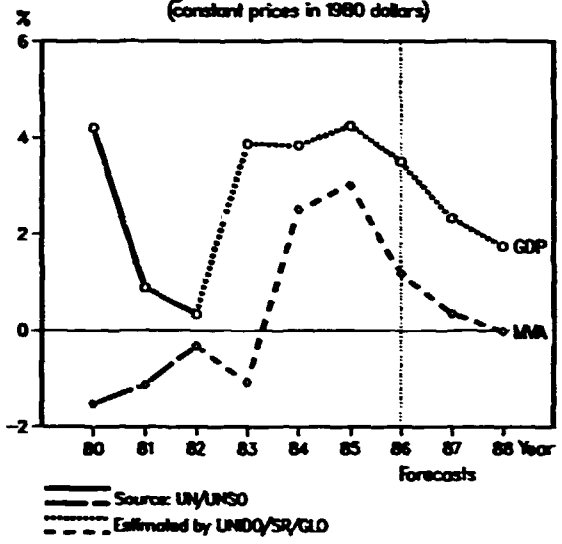


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

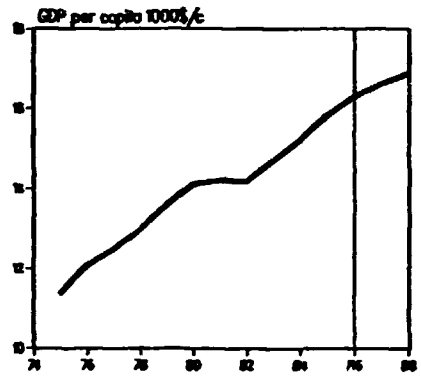


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

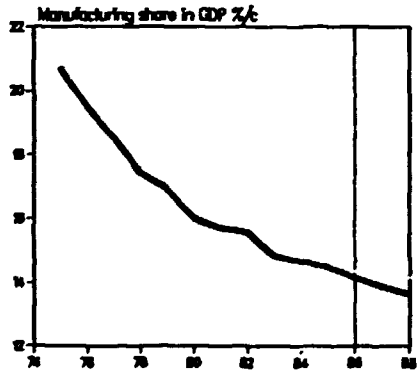


	1975	1980	1985	
GDP: /na,c (in million dollars)	46577	57713	66669	
Per capita /na,c (in dollars)	11374	14125	15854	
Manufacturing share /na,c (%)	20.7	16.0	14.5	
MANUFACTURING:				
Value added /na,c (in million dollars)	9441	9240	9510	
Value added (in million dollars)	6365	9772	8239	
Industrial production index	100	97	97	
Gross output (in million dollars)	18740	31787	25868	/e
Employment (in thousands)	364	364	315	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	66	69	70	/e
Wages and salaries (%)	19	18	17	/e
Operating surplus (%)	15	13	13	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	51525	89818	85667	/e
Value added / worker	17472	27611	26514	/e
Average wage	9860	15916	14397	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	5.37	4.16	3.20	
in percentage of θ in 1970-1975	141	109	84	
Growth rate / structural change	-0.62	-0.84	0.30	
Degree of specialization	14.4	14.5	13.7	
-VALUE ADDED: (in million dollars)				
311 Food products	846	1476	1125	
313 Beverages	191	292	290	
314 Tobacco products	20	33	26	
321 Textiles	138	213	128	
322 Wearing apparel	92	101	57	
323 Leather and fur products	16	18	11	
324 Footwear	17	24	9	
331 Wood and wood products	381	587	386	/e
332 Furniture and fixtures	130	196	138	/e
341 Paper and paper products	354	452	444	
342 Printing and publishing	375	666	667	
351 Industrial chemicals	231	452	456	
352 Other chemical products	153	227	193	/e
353 Petroleum refineries	90	103	8	
354 Miscellaneous petroleum and coal products	40	53	54	/e
355 Rubber products	36	51	32	/e
356 Plastic products	105	170	138	/e
361 Pottery, china and earthenware	21	26	18	/e
362 Glass and glass products	29	55	45	/e
369 Other non-metal mineral products	186	281	230	/e
371 Iron and steel	413	386	329	
372 Non-ferrous metals	287	743	669	
381 Metal products	406	596	454	
382 Non-electrical machinery	547	923	931	
383 Electrical machinery	409	547	528	
384 Transport equipment	781	1000	691	
385 Professional and scientific equipment	16	32	36	/e
390 Other manufacturing industries	46	69	43	/e

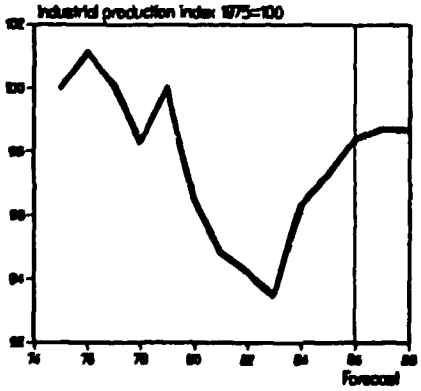
GDP per capita 1000$/c



Manufacturing share in GDP %/c

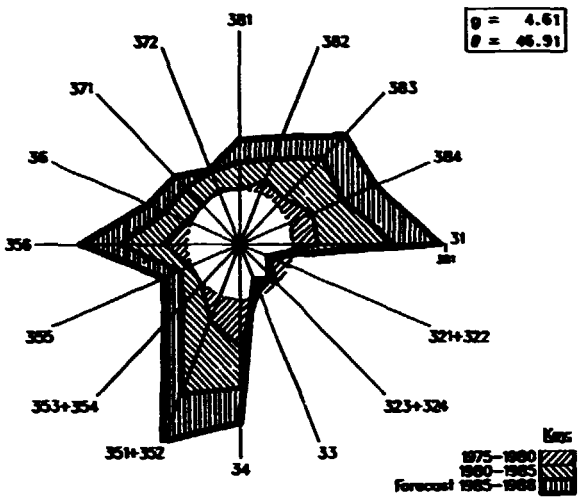


Industrial production index 1975=100

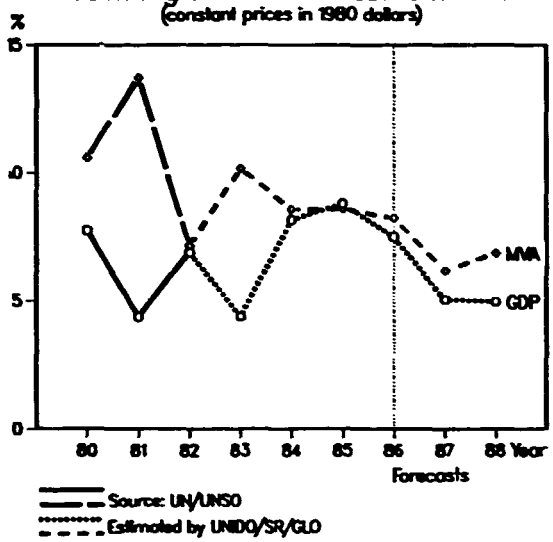


For source, footnotes and comments see "Technical notes" above.

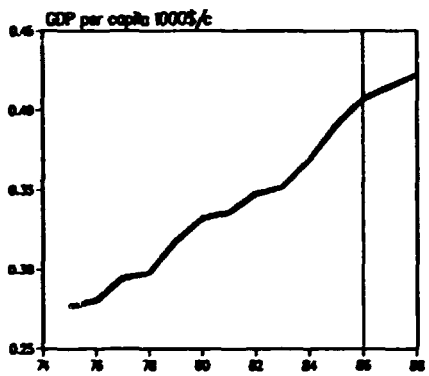
Industrial structural change
(index of value added: 1975=100)

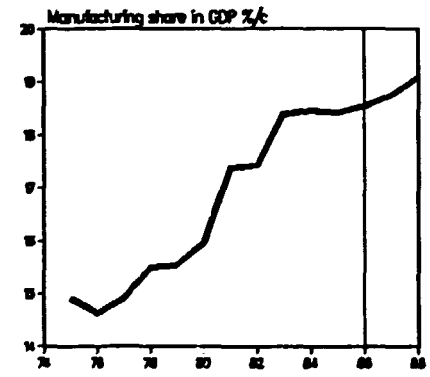


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



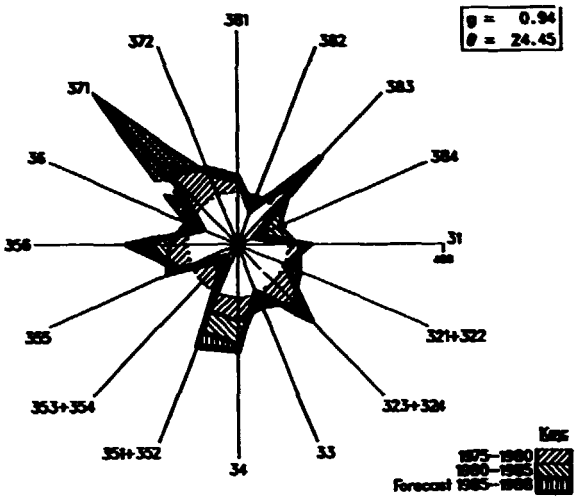
	1975	1980	1985	
GDP: /na,c (in million dollars)	20896	28807	39194	
Per capita /na,c (in dollars)	277	332	390	
Manufacturing share /na,c (%)	14.9	15.9	18.4	
MANUFACTURING:				
Value added /na,c (in million dollars)	3086	4562	7220	
Value added (in million dollars)	957	2491	2980	
Industrial production index	100	94	146	
Gross output (in million dollars)	2801	7144	8468	/e
Employment (in thousands)	450	452	466	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	63	65	65	/e
Wages and salaries (%)	9	7	7	/e
Operating surplus (%)	27	28	29	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	5775	15807	18172	/e
Value added / worker	2126	5512	6395	/e
Average wage	542	1122	1182	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	2.73	2.53	2.49	/e
in percentage of θ in 1970-1975	70	65	64	/e
Growth rate / structural change	-0.73	2.29	3.45	/e
Degree of specialization	35.5	25.2	26.5	/e
-VALUE ADDED: (in million dollars)				
311 Food products	182	431	578	/e
313 Beverages	13	46	59	/e
314 Tobacco products	89	300	406	/e
321 Textiles	288	483	504	/e
322 Wearing apparel	3	7	29	/e
323 Leather and fur products	12	41	32	/e
324 Footwear	2	4	26	/e
331 Wood and wood products	1	4	7	/e
332 Furniture and fixtures	1	3	4	/e
341 Paper and paper products	18	29	46	/e
342 Printing and publishing	11	24	19	/e
351 Industrial chemicals	52	127	170	/e
352 Other chemical products	56	156	210	/e
353 Petroleum refineries	38	158	224	/e
354 Miscellaneous petroleum and coal products	2	9	17	/e
355 Rubber products	12	28	24	/e
356 Plastic products	2	12	9	/e
361 Pottery, china and earthenware	2	5	6	/e
362 Glass and glass products	2	11	9	/e
369 Other non-metal mineral products	34	171	195	/e
371 Iron and steel	25	99	128	/e
372 Non-ferrous metals	1	1	1	/e
381 Metal products	16	73	29	/e
382 Non-electrical machinery	21	43	64	/e
383 Electrical machinery	30	78	99	/e
384 Transport equipment	32	130	79	/e
385 Professional and scientific equipment	5	6	7	/e
390 Other manufacturing industries	7	11	9	/e



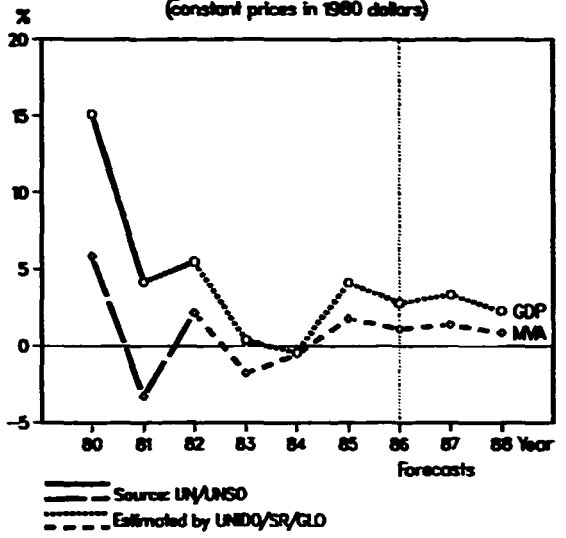


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

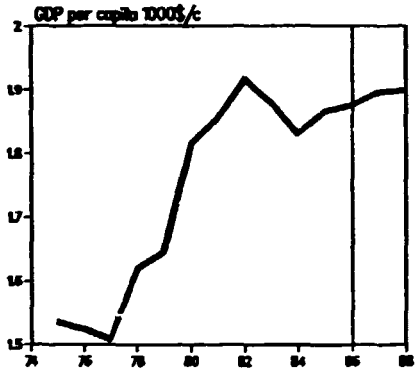


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

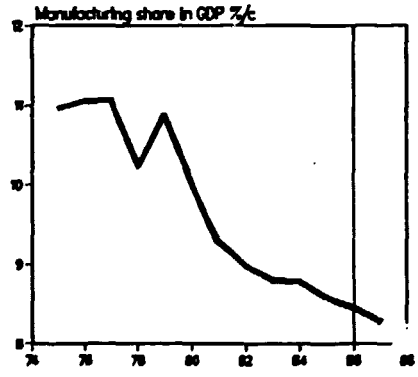


	1975	1980	1985
GDP: /na,c (in million dollars)	2621	3589	4070
Per capita /na,c (in dollars)	1535	1816	1867
Manufacturing share /na,c (%)	11.0	10.0	8.6 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	287	356	350 /e
Value added (in million dollars)	283	477	586 /e
Industrial production index	100	107	109
Gross output (in million dollars)	967	1473	2018 /e
Employment (in thousands)	27	31	39 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	71	68	71 /e
Wages and salaries (%)	8	8	10 /e
Operating surplus (%)	21	24	19 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	35995	46756	52168 /e
Value added / worker	10546	15159	15147 /e
Average wage	2968	3805	5373 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	5.99 /e	3.35 /e	1.38 /e
in percentage of θ in 1970-1975	134 /e	75 /e	31 /e
Growth rate / structural change	0.27 /e	0.42 /e	1.28 /e
Degree of specialization	30.0 /e	25.4 /e	25.4 /e
-VALUE ADDED: (in million dollars)			
311 Food products	116	155	173 /e
313 Beverages	21	52	64 /e
314 Tobacco products	15	26	32 /e
321 Textiles	3	4	3 /e
322 Wearing apparel	15	31	28 /e
323 Leather and fur products	1	4	4 /e
324 Footwear	4	7	8 /e
331 Wood and wood products	4	8	8 /e
332 Furniture and fixtures	7	8	8 /e
341 Paper and paper products	7	20	26 /e
342 Printing and publishing	13	22	40 /e
351 Industrial chemicals	2	4	6 /e
352 Other chemical products	13	26	38 /e
353 Petroleum refineries	17	27	39 /e
354 Miscellaneous petroleum and coal products	-	-	3 /e
355 Rubber products	1	2	2 /e
356 Plastic products	4	12	22 /e
361 Pottery, china and earthenware	-	-	- /e
362 Glass and glass products	1	1	3 /e
369 Other non-metal mineral products	16	31	30 /e
371 Iron and steel	3	5	4 /e
372 Non-ferrous metals	1	2	3 /e
381 Metal products	13	19	17 /e
382 Non-electrical machinery	1	1	1 /e
383 Electrical machinery	2	3	11 /e
384 Transport equipment	2	4	6 /e
385 Professional and scientific equipment	1	1	1 /e
390 Other manufacturing industries	1	2	4 /e

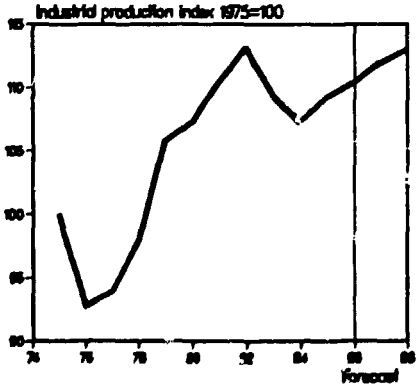
GDP per capita 1000$/c



Manufacturing share in GDP %/c

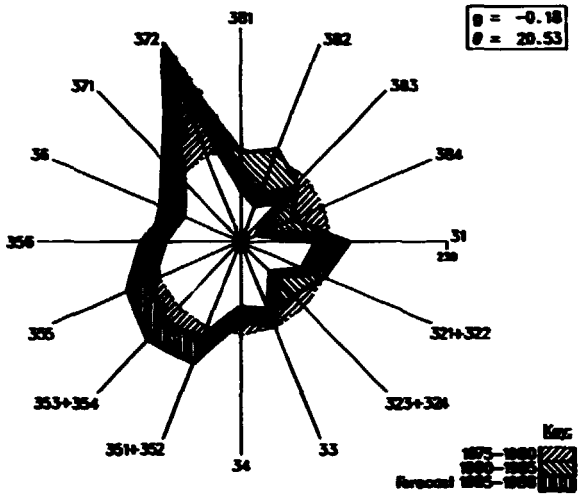


Industrial production index 1975=100

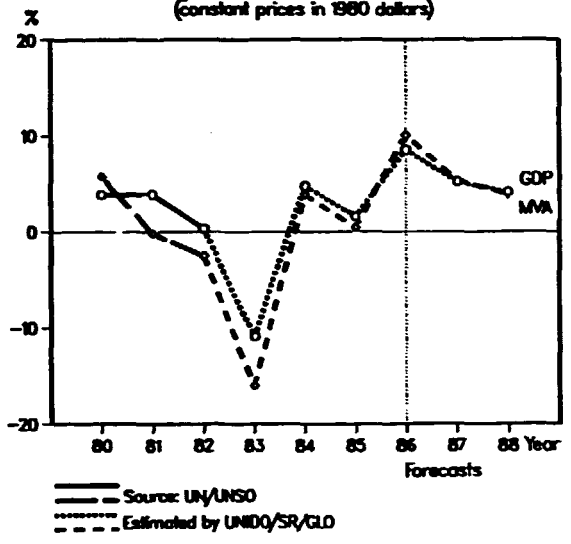


For source, footnotes and comments see "Technical notes" above.

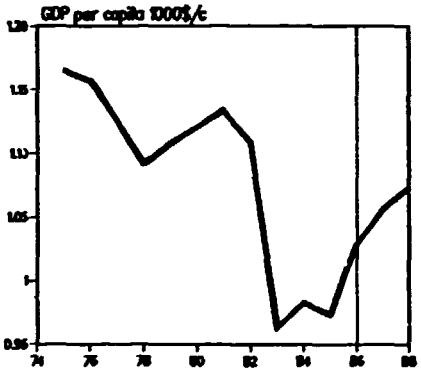
Industrial structural change
(index of value added: 1975=100)

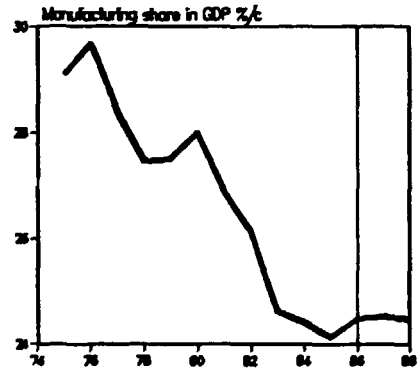


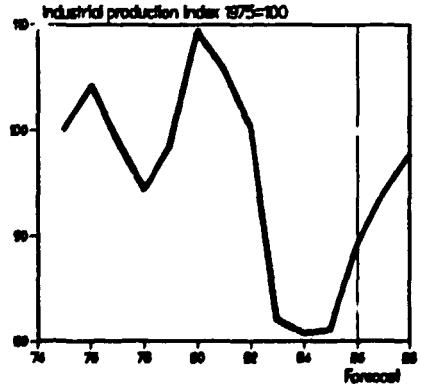
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	17686	19379	19169	
Per capita /na,c (in dollars)	1165	1120	973	
Manufacturing share /na,c (%)	29.1	28.0	24.1	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	5143	5425	4626	/e
Value added (in million dollars)	3935	5026	3544	/e
Industrial production index	100	109	81	
Gross output (in million dollars)	8638	13086	14310	/e
Employment (in thousands)	221	/e 273	254	/e
-PROFITABILITY:(in percent of gross output)				
Intermediate input (%)	54	62	75	/e
Wages and salaries (%)	8	/e 6	5	/e
Operating surplus (%)	38	/e 32	20	/e
-PRODUCTIVITY:(in dollars)				
Gross output / worker	39049	/e 47877	48658	/e
Value added / worker	17789	/e 18389	12052	/e
Average wage	2968	/e 2848	2306	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	4.94	7.42	2.31	
in percentage of θ in 1970-1975	74	111	34	
Growth rate / structural change	1.31	1.47	0.17	
Degree of specialization	11.9	14.5	15.1	
-VALUE ADDED:(in million dollars)				
311 Food products	611	774	522	/e
313 Beverages	333	383	330	/e
314 Tobacco products	77	86	66	/e
321 Textiles	390	470	432	/e
322 Wearing apparel	95	95	66	/e
323 Leather and fur products	29	57	37	/e
324 Footwear	56	41	18	/e
331 Wood and wood products	48	82	74	/e
332 Furniture and fixtures	46	41	33	/e
341 Paper and paper products	98	158	83	/e
342 Printing and publishing	86	101	88	/e
351 Industrial chemicals	141	217	187	/e
352 Other chemical products	228	291	174	/e
353 Petroleum refineries	94	194	218	/e
354 Miscellaneous petroleum and coal products	2	6	5	/e
355 Rubber products	53	62	53	/e
356 Plastic products	89	90	62	/e
361 Pottery, china and earthenware	16	16	6	/e
362 Glass and glass products	37	48	24	/e
369 Other non-metal mineral products	100	130	96	/e
371 Iron and steel	93	194	106	/e
372 Non-ferrous metals	148	609	414	/e
381 Metal products	152	190	117	/e
382 Non-electrical machinery	130	157	57	/e
383 Electrical machinery	168	213	119	/e
384 Transport equipment	178	281	105	/e
385 Professional and scientific equipment	12	14	12	/e
390 Other manufacturing industries	427	59	43	/e

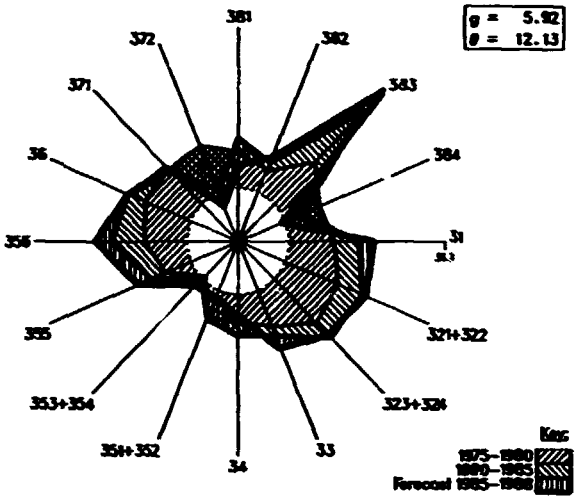




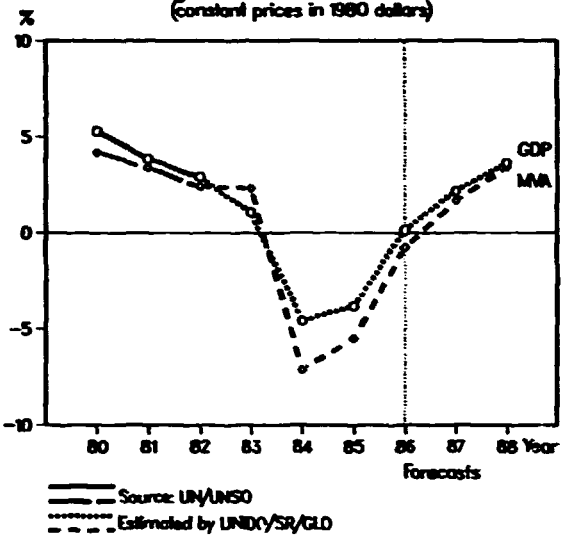


For source, footnotes and comments see "Technical notes" above.

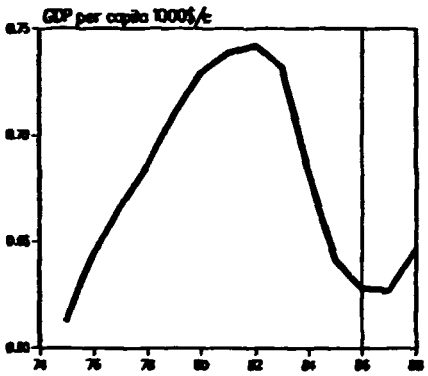
Industrial structural change
(Index of value added: 1975=100)

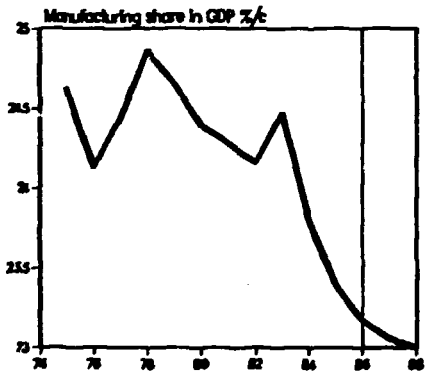


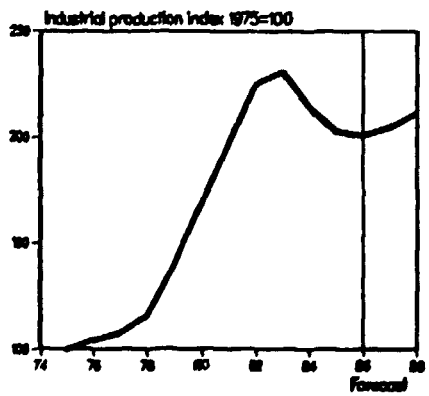
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	26089	35236	34937	
Per capita /na,c (in dollars)	612	729	641	
Manufacturing share /na,c (%)	24.6	24.4	23.4	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	6421	8595	8171	/e
Value added (in million dollars)	2631	5454	4982	/e
Industrial production index	100	169	202	
Gross output (in million dollars)	6996	18310	19209	/e
Employment (in thousands)	505	1053	1103	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	62	70	74	/e
Wages and salaries (%)	6	8	8	/e
Operating surplus (%)	32	22	18	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	13857	17384	17420	/e
Value added / worker	5212	5178	4518	/e
Average wage	773	1306	1357	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	9.48	1.95	1.37	
in percentage of θ in 1970-1975	145	30	21	
Growth rate / structural change	0.38	10.37	-4.03	
Degree of specialization	21.8	22.2	23.4	
-VALUE ADDED: (in million dollars)				
311 Food products	656	1064	1023	/e
313 Beverages	398	325	453	/e
314 Tobacco products	188	357	325	/e
321 Textiles	186	393	361	/e
322 Wearing apparel	25	256	330	/e
323 Leather and fur products	4	9	7	/e
324 Footwear	3	16	18	/e
331 Wood and wood products	97	260	204	/e
332 Furniture and fixtures	12	62	53	/e
341 Paper and paper products	67	190	74	/e
342 Printing and publishing	22	67	104	/e
351 Industrial chemicals	67	306	189	/e
352 Other chemical products	166	342	243	/e
353 Petroleum refineries	176	319	451	/e
354 Miscellaneous petroleum and coal products	2	2	2	/e
355 Rubber products	43	146	94	/e
356 Plastic products	36	77	91	/e
361 Pottery, china and earthenware	11	27	16	/e
362 Glass and glass products	16	52	48	/e
369 Other non-metal mineral products	68	164	115	/e
371 Iron and steel	79	162	80	/e
372 Non-ferrous metals	10	49	15	/e
381 Metal products	72	130	159	/e
382 Non-electrical machinery	50	80	120	/e
383 Electrical machinery	74	228	232	/e
384 Transport equipment	96	319	128	/e
385 Professional and scientific equipment	2	13	9	/e
390 Other manufacturing industries	10	40	36	/e

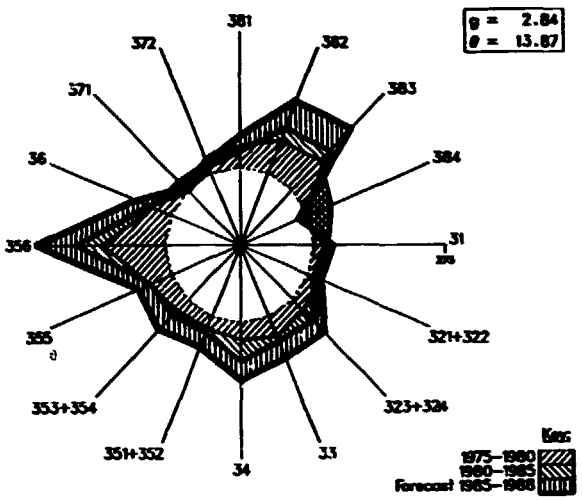




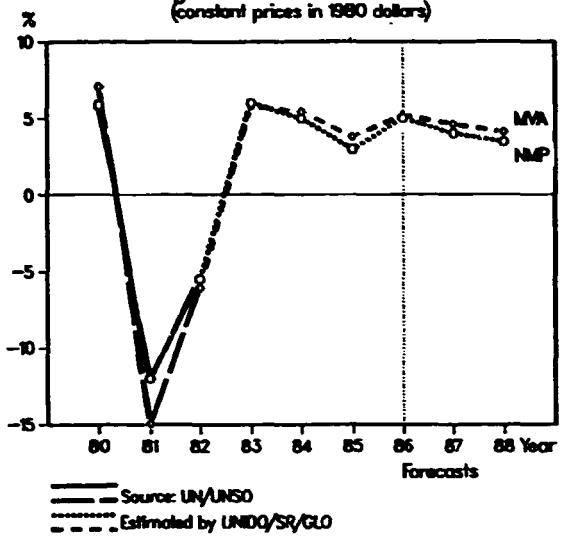


For sources, footnotes and comments see "Technical notes" above.

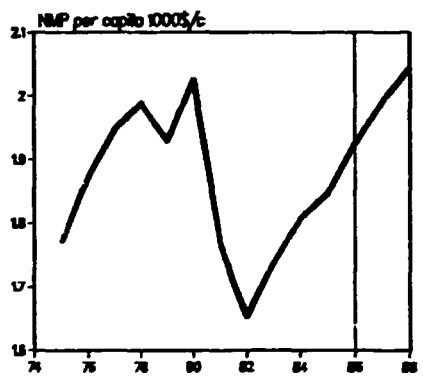
Industrial structural change
(index of value added: 1975=100)

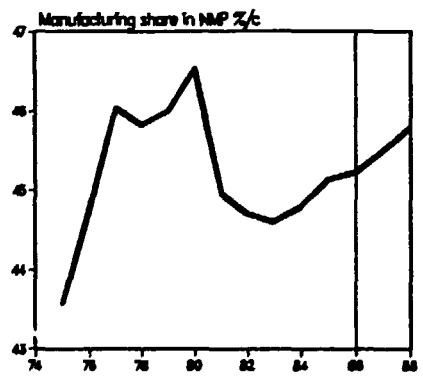


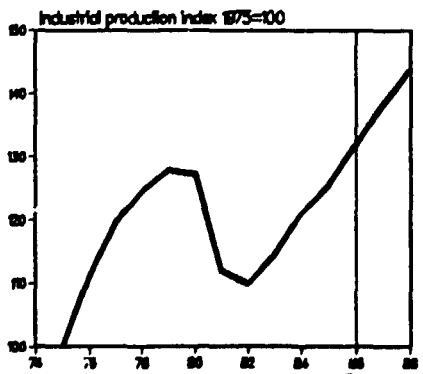
Annual growth rates of MVA and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
MVP: /na,c (in million dollars)	60250	72039	68671	
Per capita /na,c (in dollars)	1771	2025	1847	
Manufacturing share /na,c (%)	43.6	46.5	45.1	
MANUFACTURING:				
Value added /na,c (in million dollars)	26248	33515	30996	
Value added (in million dollars)	37063	30410	24781	
Industrial production index	100	127	125	
Gross output (in million dollars)	...	...	...	
Employment (in thousands)	4041	4126	3764	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	...	...	...	
Wages and salaries (%)	...	...	...	
Operating surplus (%)	...	...	...	
-PRODUCTIVITY: (in dollars)				
Gross output / worker	...	...	...	
Value added / worker	9172	7370	6583	/e
Average wage	2206	2065	1611	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	1.64	1.11	2.31	
in percentage of θ in 1970-1975	72	49	102	
Growth rate / structural change	7.70	-0.41	1.64	
Degree of specialization	13.2	13.4	12.4	
-VALUE ADDED: (in million dollars)				
311 Food products	919	-1154	896	/e
313 Beverages	4418	4078	3983	/e
314 Tobacco products	693	845	66	/e
321 Textiles	4975	3723	2280	/e
322 Wearing apparel	989	762	843	/e
323 Leather and fur products	186	163	207	/e
324 Footwear	587	536	410	/e
331 Wood and wood products	806	563	391	/e
332 Furniture and fixtures	622	664	506	/e
341 Paper and paper products	402	298	196	/e
342 Printing and publishing	221	205	192	/e
351 Industrial chemicals	1832	1114	649	/e
352 Other chemical products	1245	1280	584	/e
353 Petroleum refineries	2495	1410	1478	/e
354 Miscellaneous petroleum and coal products	186	72	67	/e
355 Rubber products	562	422	298	/e
356 Plastic products	291	479	310	/e
361 Pottery, china and earthenware	110	130	149	/e
362 Glass and glass products	331	358	314	/e
369 Other non-metal mineral products	768	446	666	/e
371 Iron and steel	2164	1157	1077	/e
372 Non-ferrous metals	477	801	321	/e
381 Metal products	1466	1789	1306	/e
382 Non-electrical machinery	3730	4346	3199	/e
383 Electrical machinery	2199	2075	1645	/e
384 Transport equipment	3594	3244	2063	/e
385 Professional and scientific equipment	402	325	239	/e
390 Other manufacturing industries	402	316	448	/e

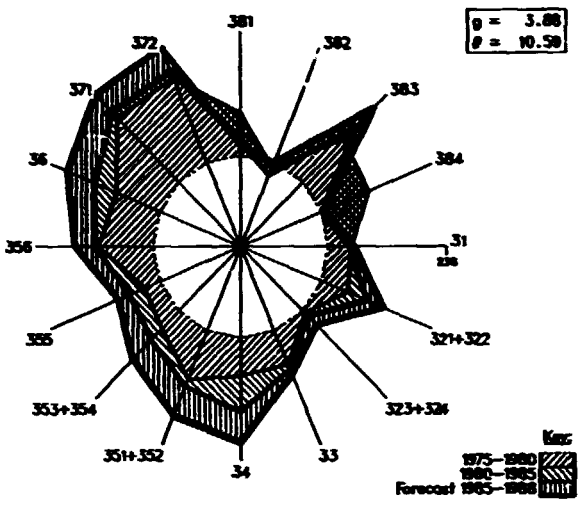




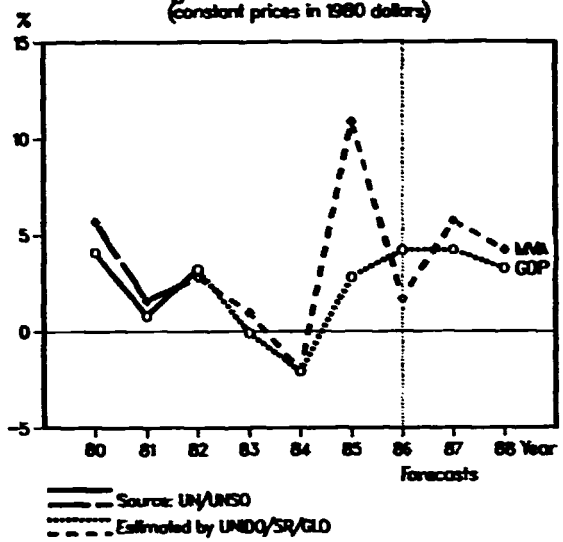


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

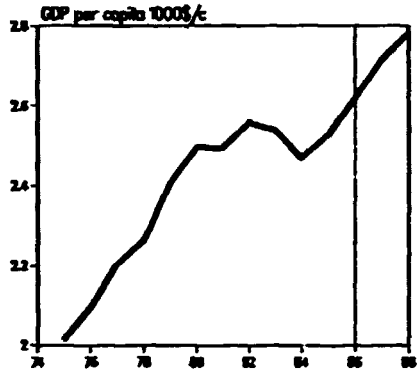


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



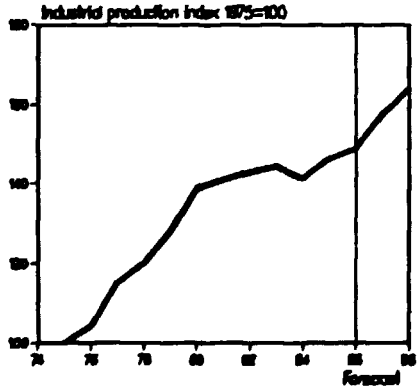
	1975	1980	1985	
GDP: /na,c (in million dollars)	18974	24659	25804	
Per capita /na,c (in dollars)	2013	2496	2527	
Manufacturing share /na,c (%)	29.5	30.2	33.0	
MANUFACTURING:				
Value added /na,c (in million dollars)	5595	7441	8516	
Value added (in million dollars)	2965	5602	4970	
Industrial production index	100	139	146	
Gross output (in million dollars)	8355	17932	18347	/e
Employment (in thousands)	504	680	697	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	65	69	75	/e
Wages and salaries (%)	22	13	13	/e
Operating surplus (%)	14	18	12	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	13842	26356	26308	/e
Value added / worker	4912	8233	6630	/e
Average wage	2996	3564	3405	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	9.92	2.64	3.84	
in percentage of θ in 1970-1975	216	55	84	
Growth rate / structural change	-0.78	3.36	0.91	
Degree of specialization	16.2	15.1	15.9	
-VALUE ADDED: (in million dollars)				
311 Food products	362	544	456	
313 Beverages	95	136	121	
314 Tobacco products	47	64	65	
321 Textiles	474	905	832	
322 Wearing apparel	84	186	181	/e
323 Leather and fur products	19	41	40	
324 Footwear	50	86	83	/e
331 Wood and wood products	139	325	217	
332 Furniture and fixtures	53	106	86	/e
341 Paper and paper products	145	274	179	/e
342 Printing and publishing	113	180	128	/e
351 Industrial chemicals	118	147	124	/e
352 Other chemical products	148	224	221	/e
353 Petroleum refineries	25	219	240	/e
354 Miscellaneous petroleum and coal products	-	-	-	/e
355 Rubber products	41	58	57	/e
356 Plastic products	65	128	125	/e
361 Pottery, china and earthenware	42	80	76	/e
362 Glass and glass products	49	87	72	
369 Other non-metal mineral products	149	295	202	/e
371 Iron and steel	66	207	182	
372 Non-ferrous metals	18	33	30	/e
381 Metal products	180	323	206	
382 Non-electrical machinery	83	170	127	
383 Electrical machinery	166	319	288	
384 Transport equipment	223	428	152	
385 Professional and scientific equipment	7	15	16	/e
390 Other manufacturing industries	14	20	17	/e

GDP per capita 1000$/c



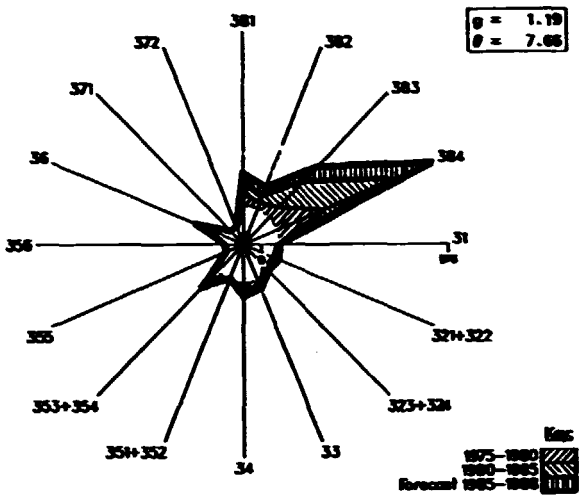
Manufacturing share in GDP %/c

Industrial production index 1975=100

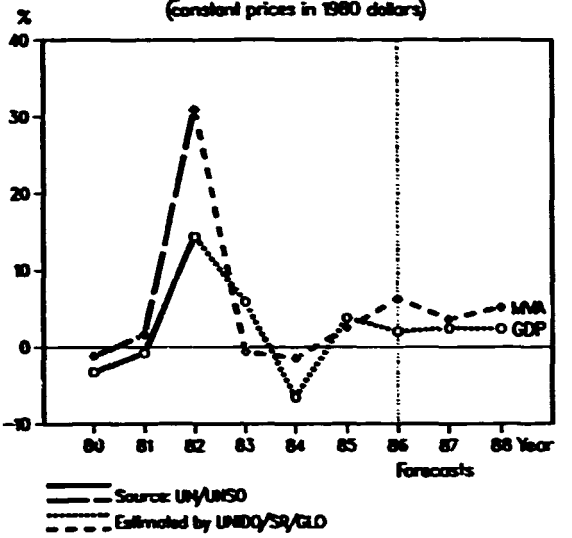


For source, footnotes and comments see "Technical notes" above.

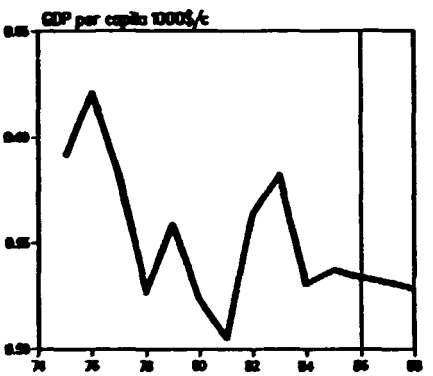
Industrial structural change
(index of value added: 1975=100)

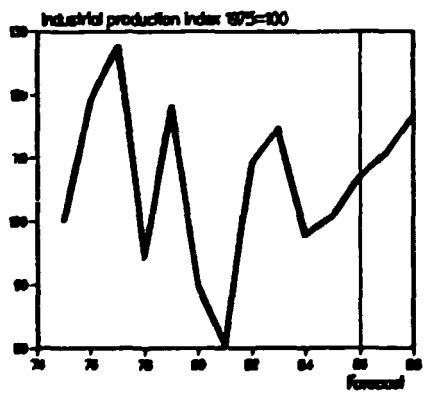


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



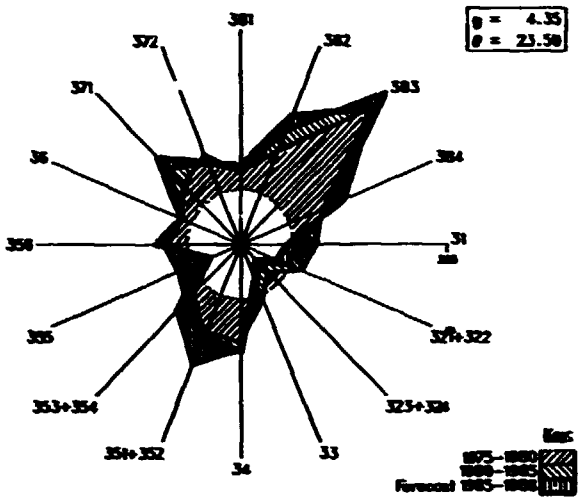
	1975	1980	1985	
GDP: /na,c (in million dollars)	2819	2970	3463	
Per capita /na,c (in dollars)	591	524	537	
Manufacturing share /na,c (%)	13.5	14.7	16.9	
MANUFACTURING:				
Value added /na,c (in million dollars)	381	438	585	
Value added (in million dollars)	236	258	256	
Industrial production index	100	90	101	
Gross output (in million dollars)	819	1070	954	/e
Employment (in thousands)	24	32	24	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	71	76	73	/e
Wages and salaries (%)	9	10	10	/e
Operating surplus (%)	20	14	16	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	34723	33812	38365	/e
Value added / worker	9957	8164	10567	/e
Average wage	3023	3518	4125	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	5.98	/e 7.69	/e 1.91	/e
in percentage of θ in 1970-1975	100	/e 139	/e 34	/e
Growth rate / structural change	1.81	/e -3.08	/e 1.50	/e
Degree of specialization	32.2	/e 25.5	/e 25.1	/e
-VALUE ADDED: (in million dollars)				
311 Food products	89	105	97	/e
313 Beverages	9	11	10	/e
314 Tobacco products	14	7	11	/e
321 Textiles	37	33	22	/e
322 Wearing apparel	7	10	7	/e
323 Leather and fur products	3	5	4	/e
324 Footwear	1	2	2	/e
331 Wood and wood products	4	2	1	/e
332 Furniture and fixtures	5	2	1	/e
341 Paper and paper products	3	4	5	/e
342 Printing and publishing	5	6	7	/e
351 Industrial chemicals	12	16	17	/e
352 Other chemical products	4	5	6	/e
353 Petroleum refineries	14	18	20	/e
354 Miscellaneous petroleum and coal products	-	-	-	/e
355 Rubber products	-	-	-	/e
356 Plastic products	-	-	-	/e
361 Pottery, china and earthenware	-	-	-	/e
362 Glass and glass products	-	-	-	/e
369 Other non-metal mineral products	8	12	16	/e
371 Iron and steel	-	-	-	/e
372 Non-ferrous metals	-	-	-	/e
381 Metal products	10	10	16	/e
382 Non-electrical machinery	3	3	5	/e
383 Electrical machinery	1	1	2	/e
384 Transport equipment	5	5	8	/e
385 Professional and scientific equipment	-	-	-	/e
390 Other manufacturing industries		-	-	/e



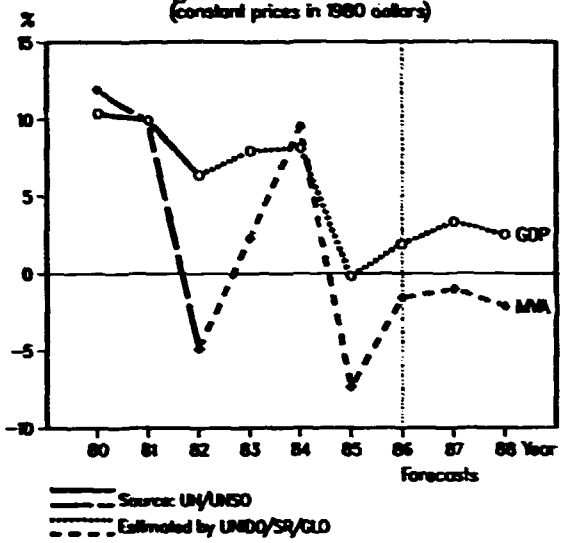


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

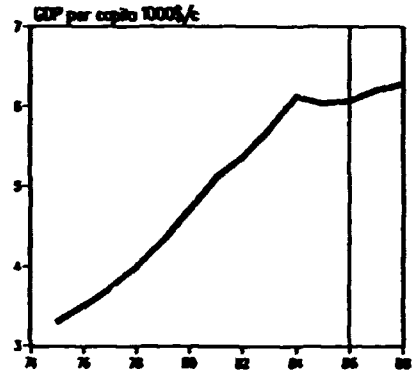


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

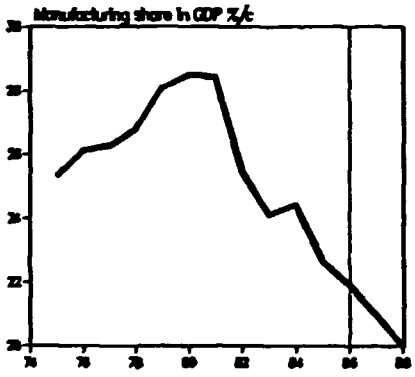


	1975	1980	1985
GDP: /na,c (in million dollars)	7469	11343	15449
Per capita /na,c (in dollars)	3296	4697	6037
Manufacturing share /na,c (%)	25.3	28.5	22.7
MANUFACTURING:			
Value added /na,c (in million dollars)	1888	3231	3501
Value added (in million dollars)	1478	4074	4806
Industrial production index	100	172	183
Gross output (in million dollars)	5625	15483	18745 /e
Employment (in thousands)	198	295	283 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	74 /e	74 /e	74 /e
Wages and salaries (%)	9 /e	8 /e	10 /e
Operating surplus (%)	17 /e	19 /e	15 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	28377 /e	52573 /e	66252 /e
Value added / worker	7455 /e	13833 /e	16986 /e
Average wage	2582 /e	4103 /e	6777 /e
-STRUCTURAL INDICES:			
Structural change S (in degrees)	11.71 /e	5.74 /e	2.60 /e
in percentage of S in 1970-1975	162 /e	74 /e	34 /e
Growth rate / structural change	-0.15 /e	1.98 /e	-2.83 /e
Degree of specialization	14.4 /e	20.8 /e	24.1 /e
-VALUE ADDED: (in million dollars)			
311 Food products	66	129	169 /e
313 Beverages	24	51	64 /e
314 Tobacco products	15	25	33 /e
321 Textiles	34	76	97 /e
322 Wearing apparel	42	132	173 /e
323 Leather and fur products	3	7	7 /e
324 Footwear	5	11	11 /e
331 Wood and wood products	36	87	48 /e
332 Furniture and fixtures	11	44	61 /e
341 Paper and paper products	14	46	73 /e
342 Printing and publishing	55	136	233 /e
351 Industrial chemicals	18	51	107 /e
352 Other chemical products	59	143	285 /e
353 Petroleum refineries	238 /e	631 /e	387 /e
354 Miscellaneous petroleum and coal products	17 /e	66 /e	48 /e
355 Rubber products	23	44	24 /e
356 Plastic products	19	84	104 /e
361 Pottery, china and earthenware	-	1	1 /e
362 Glass and glass products	5	11	14 /e
369 Other non-metal mineral products	47	82	150 /e
371 Iron and steel	21	62	49 /e
372 Non-ferrous metals	5	11	19 /e
381 Metal products	74	202	343 /e
382 Non-electrical machinery	133	380	407 /e
383 Electrical machinery	199	849	1414 /e
384 Transport equipment	283	601	414 /e
385 Professional and scientific equipment	37	81	88 /e
390 Other manufacturing industries	17	66	84 /e

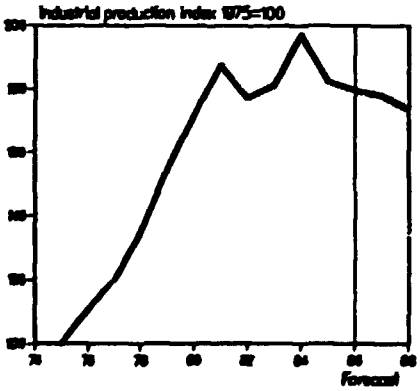
GDP per capita 1000$/c



Manufacturing share in GDP %/c

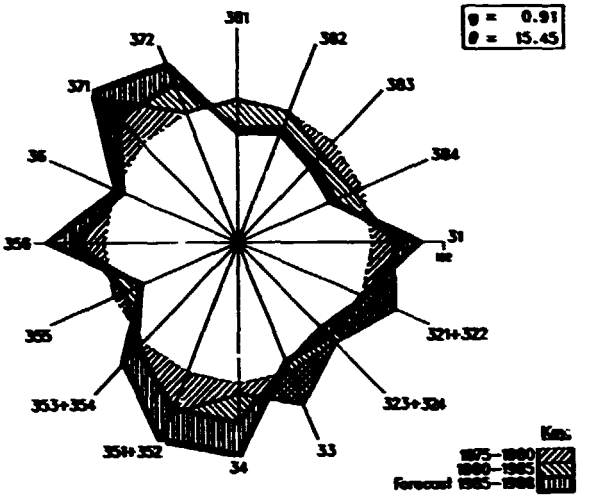


Industrial production index 1975=100

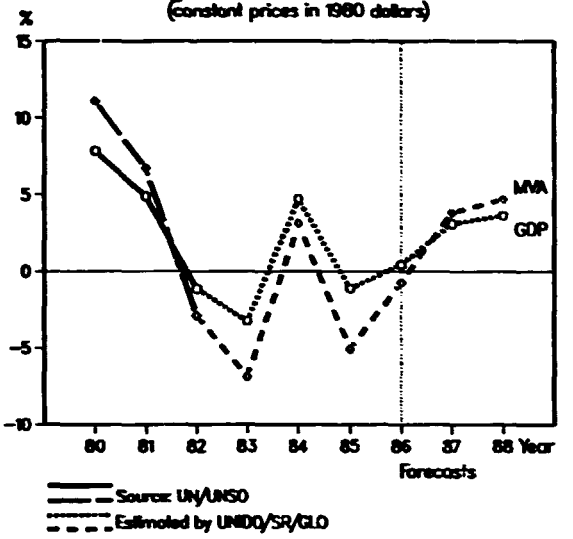


For source, footnotes and comments see "Technical notes" above.

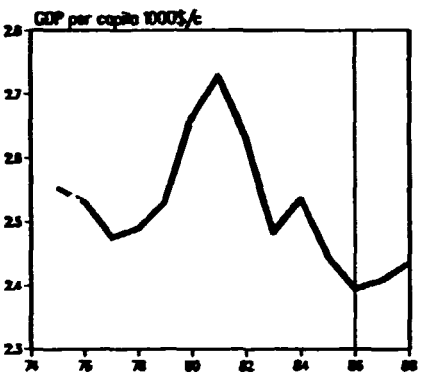
Industrial structural change
(index of value added: 1975=100)

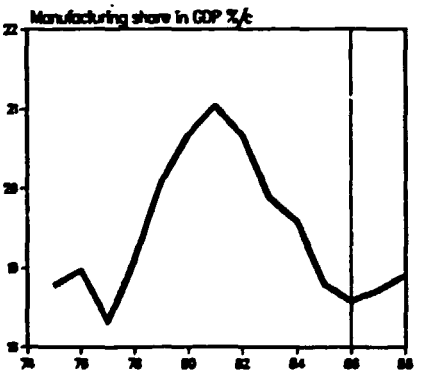


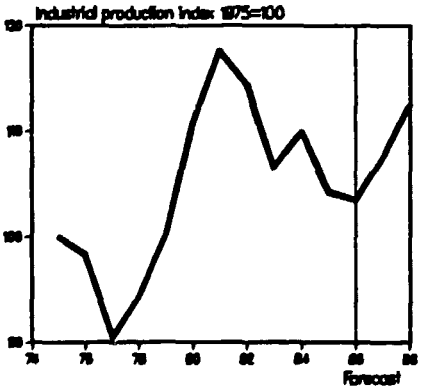
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	65085	76261	79197
Per capita /na,c (in dollars)	2552	2665	2445
Manufacturing share /na,c (%)	18.8	20.7	18.8
MANUFACTURING:			
Value added /na,c (in million dollars)	12220	15765	14886
Value added (in million dollars)	7623	17810	12088
Industrial production index	100	111	104
Gross output (in million dollars)	24853	57257 /e	36196 /e
Employment (in thousands)	1254	1411	1308 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	69	69 /e	67 /e
Wages and salaries (%)	17	16 /e	18 /e
Operating surplus (%)	14	16 /e	15 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	19659	40586 /e	25893 /e
Value added / worker	6079	12622	8647 /e
Average wage	3290	6136	4674 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	3.99	3.27	2.16
in percentage of θ in 1970-1975	112	91	60
Growth rate / structural change	0.53	3.24	-2.35
Degree of specialization	10.7	10.5	9.9
-VALUE ADDED: (in million dollars)			
311 Food products	770	1657	1191 /e
313 Beverages	286	469	436 /e
314 Tobacco products	55	111	95 /e
321 Textiles	400	886	490 /e
322 Wearing apparel	301	477	295 /e
323 Leather and fur products	36	59	40 /e
324 Footwear	90	152	107 /e
331 Wood and wood products	130	233	156 /e
332 Furniture and fixtures	113	219	137 /e
341 Paper and paper products	286	581	329 /e
342 Printing and publishing	321	549	413 /e
351 Industrial chemicals	343	1009	513 /e
352 Other chemical products	351	644	793 /e
353 Petroleum refineries	225	638	775 /e
354 Miscellaneous petroleum and coal products	40	112	136 /e
355 Rubber products	131	297	195 /e
356 Plastic products	98	317	239 /e
361 Pottery, china and earthenware	19	28	17 /e
362 Glass and glass products	84	123	164 /e
369 Other non-metal mineral products	369	866	618 /e
371 Iron and steel	749	2136	1332 /e
372 Non-ferrous metals	143	566	396 /e
381 Metal products	687	1532	915 /e
382 Non-electrical machinery	538	1404	859 /e
383 Electrical machinery	414	1229	764 /e
384 Transport equipment	563	1302	858 /e
385 Professional and scientific equipment	31	49	31 /e
390 Other manufacturing industries	119	199	191 /e

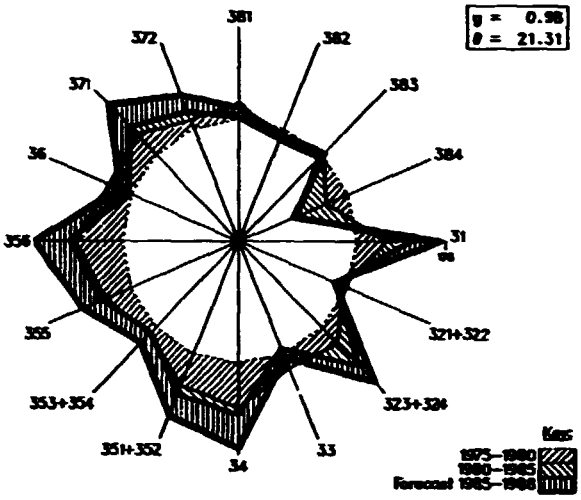




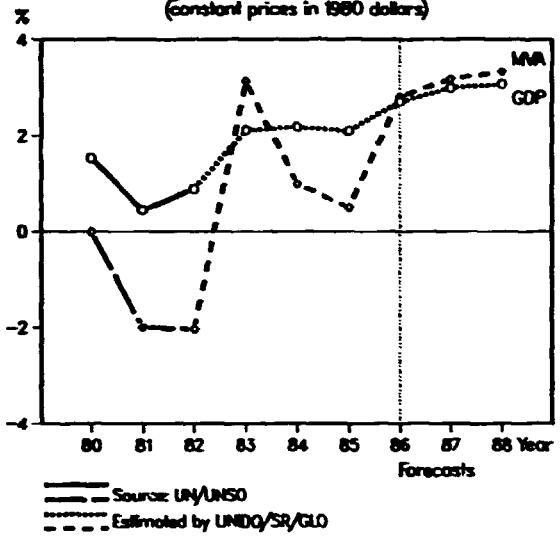


For source, footnotes and comments see "Technical notes" above.

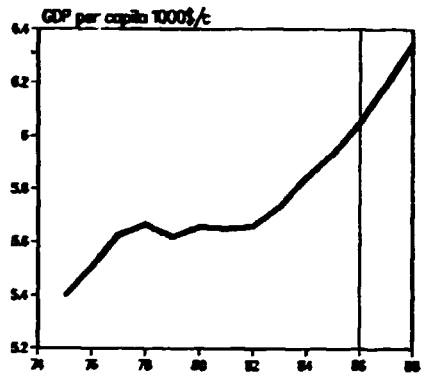
Industrial structural change
(index of value added: 1975=100)

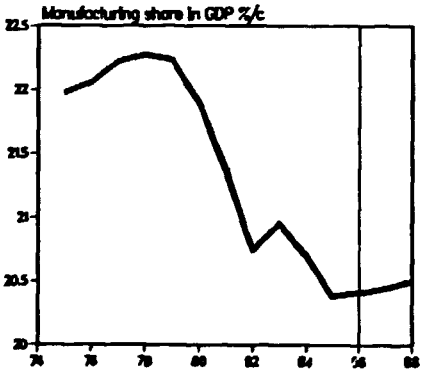


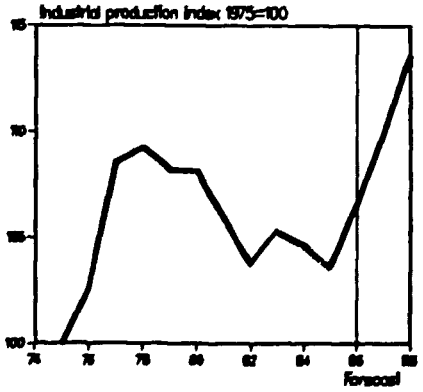
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	192183	211781	228676	
Per capita /na,c (in dollars)	5399	5658	5931	
Manufacturing share /na,c (%)	22.0	21.9	20.4	
MANUFACTURING:				
Value added /na,c (in million dollars)	42227	46370	46597	
Value added (in million dollars)	18649	51576	37203	
Industrial production index	100	108	104	
Gross output (in million dollars)	64870	148168	109990	/e
Employment (in thousands)	2178	2368	2017	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	71	65	67	/e
Wages and salaries (%)	17	16	14	/e
Operating surplus (%)	12	19	19	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	29784	62571	54537	/e
Value added / worker	8563	21780	18018	/e
Average wage	5099	9805	7863	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.79	3.07	5.50	
in percentage of θ in 1970-1975	88	71	127	
Growth rate / structural change	-1.26	-0.02	-0.18	
Degree of specialization	10.1	8.4	7.6	
-VALUE ADDED: (in million dollars)				
311 Food products	1646	5666	4857	/e
313 Beverages	458	1932	1480	/e
314 Tobacco products	280	649	400	/e
321 Textiles	1341	3255	1838	
322 Wearing apparel	563	1508	798	/e
323 Leather and fur products	273	374	264	
324 Footwear	397	810	476	/e
331 Wood and wood products	254	1294	657	
332 Furniture and fixtures	641	1261	736	/e
341 Paper and paper products	665	1278	1149	/e
342 Printing and publishing	530	1506	1071	/e
351 Industrial chemicals	1310	2105	1734	/e
352 Other chemical products	927	2296	1677	/e
353 Petroleum refineries	368	1407	1784	
354 Miscellaneous petroleum and coal products	52	116	183	/e
355 Rubber products	361	955	681	/e
356 Plastic products	503	1098	888	/e
361 Pottery, china and earthenware	364	340	252	/e
362 Glass and glass products	287	640	405	/e
369 Other non-metal mineral products	789	2640	1595	/e
371 Iron and steel	993	3182	2329	/e
372 Non-ferrous metals	347	1049	703	/e
381 Metal products	1646	4219	2676	
382 Non-electrical machinery	636	2913	1917	
383 Electrical machinery	1232	3669	2527	
384 Transport equipment	1510	4743	2784	
385 Professional and scientific equipment	111	206	153	/e
390 Other manufacturing industries	127	478	324	/e

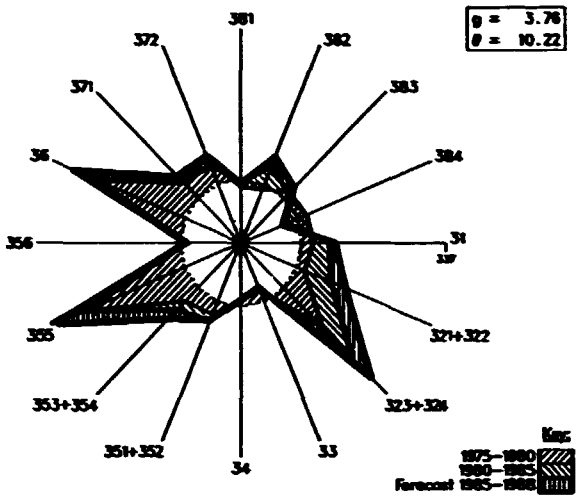




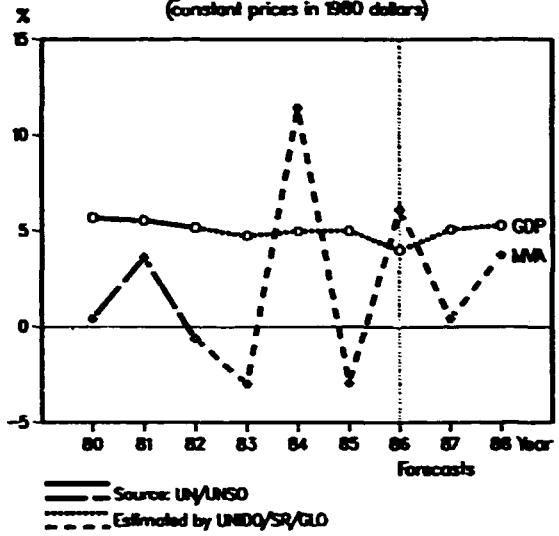


For source, footnotes and comments see "Technical notes" above.

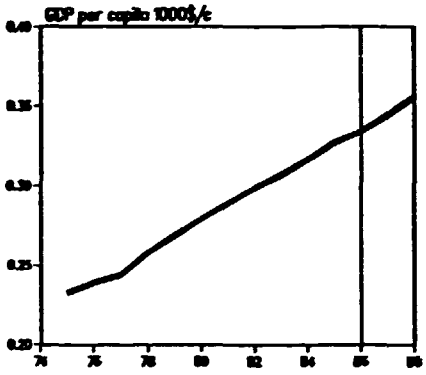
Industrial structural change
(index of value added: 1975=100)



Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

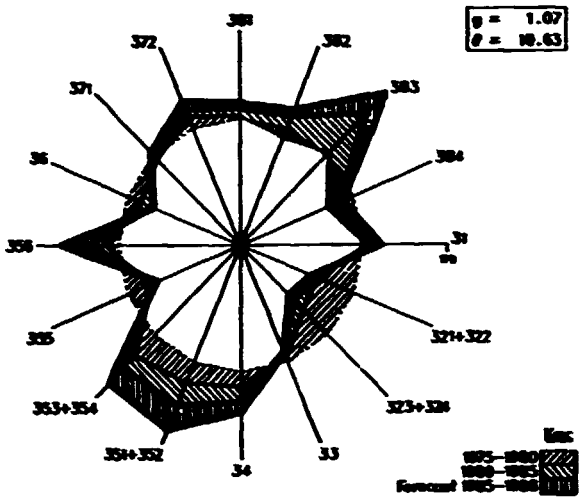


	1975	1980	1985
GDP: /na,c (in million dollars)	3165	4133	5298
Per capita /na,c (in dollars)	233	279	327
Manufacturing share /na,c (%)	22.3	18.2	15.3 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	707	751	811 /e
Value added (in million dollars)	313 /e	307	366 /e
Industrial production index	100	123	146
Gross output (in million dollars)	717 /e	1129	1231 /e
Employment (in thousands)	128	163	174 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	...	73	...
Wages and salaries (%)	...	7	...
Operating surplus (%)	...	20	...
-PRODUCTIVITY: (in dollars)			
Gross output / worker	5622 /e	6934	7069 /e
Value added / worker	2455 /e	1887	2042 /e
Average wage	...	1286	...
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	5.74	23.90	1.06
in percentage of θ in 1970-1975	47	195	9
Growth rate / structural change	-0.27	-0.57	-2.81
Degree of specialization	26.2	25.1	26.7
-VALUE ADDED: (in million dollars)			
311 Food products	30 /e	28	28 /e
313 Beverages	6 /e	8	5 /e
314 Tobacco products	52 /e	63	92 /e
321 Textiles	50 /e	27	31 /e
322 Wearing apparel	12 /e	12	21 /e
323 Leather and fur products	2 /e	1	1 /e
324 Footwear	4 /e	2	2 /e
331 Wood and wood products	4 /e	5	8 /e
332 Furniture and fixtures	1 /e	1	1 /e
341 Paper and paper products	10 /e	8	2 /e
342 Printing and publishing	3 /e	4	3 /e
351 Industrial chemicals	3 /e	6	17 /e
352 Other chemical products	22 /e	12	13 /e
353 Petroleum refineries	18 /e	56	33 /e
354 Miscellaneous petroleum and coal products	1 /e	-	- /e
355 Rubber products	13 /e	14	24 /e
356 Plastic products	6 /e	4	4 /e
361 Pottery, china and earthenware	6 /e	4	6 /e
362 Glass and glass products	2 /e	2	2 /e
369 Other non-metal mineral products	20 /e	21	32 /e
371 Iron and steel	3 /e	3	3 /e
372 Non-ferrous metals	2 /e	2	2 /e
381 Metal products	11 /e	7	7 /e
382 Non-electrical machinery	8 /e	4	5 /e
383 Electrical machinery	14 /e	10	11 /e
384 Transport equipment	6 /e	4	1 /e
385 Professional and scientific equipment	1 /e	1	- /e
390 Other manufacturing industries	2 /e	1	2 /e

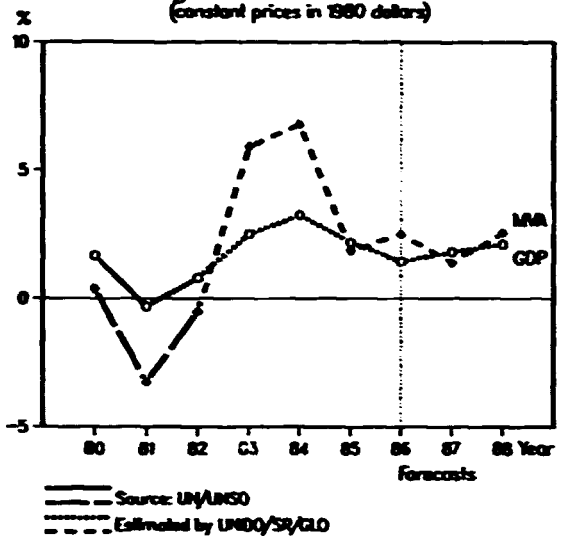


For source, footnotes and comments see "Technical notes" above.

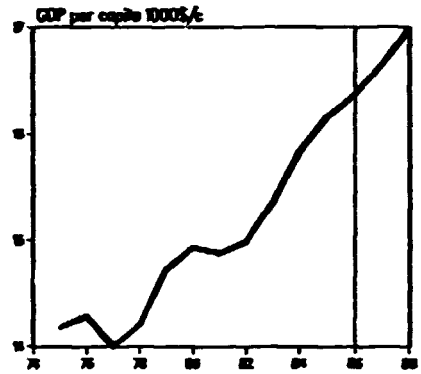
Industrial structural change
(index of value added: 1975=100)

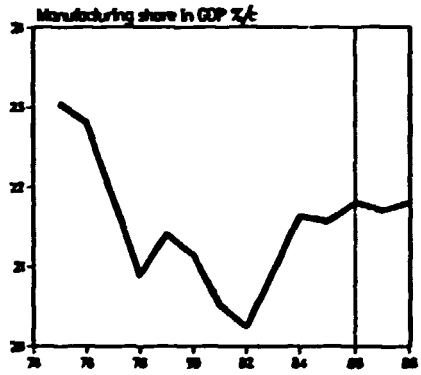


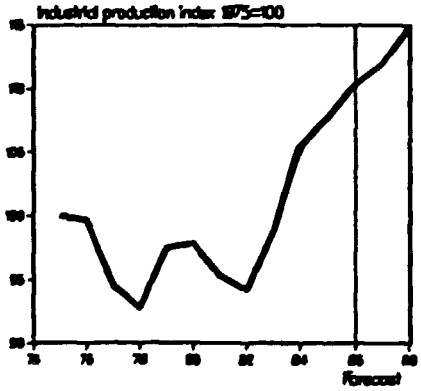
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	116205	124137	134961	
Per capita /na,c (in dollars)	14183	14936	16158	
Manufacturing share /na,c (%)	23.0	21.1	21.6	
MANUFACTURING:				
Value added /na,c (in million dollars)	26774	26245	29111	
Value added (in million dollars)	21088	30805	24872	
Industrial production index	100	98	108	
Gross output (in million dollars)	46881	73194	60550	/e
Employment (in thousands)	926	853	765	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	54	58	59	/e
Wages and salaries (%)	22	18	15	/e
Operating surplus (%)	25	24	26	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	49353	85808	79145	/e
Value added / worker	22784	36231	32768	/e
Average wage	10646	16835	11842	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	5.88	3.30	2.22	
In percentage of θ in 1970-1975	100	115	78	
Growth rate / structural change	-0.43	0.10	0.95	
Degree of specialization	16.5	16.7	18.1	
-VALUE ADDED: (in million dollars)				
311 Food products	1802	2719	2005	
313 Beverages	222	338	270	
314 Tobacco products	63	104	95	
321 Textiles	448	634	416	
322 Wearing apparel	313	274	153	
323 Leather and fur products	51	64	38	
324 Footwear	51	61	30	
331 Wood and wood products	1236	2102	1308	/e
332 Furniture and fixtures	301	452	264	/e
341 Paper and paper products	2088	2586	2807	/e
342 Printing and publishing	1080	1842	1603	
351 Industrial chemicals	624	986	938	/e
352 Other chemical products	561	1246	988	/e
353 Petroleum refineries	82	359	341	
354 Miscellaneous petroleum and coal products	80	137	22	/e
355 Rubber products	256	314	237	/e
356 Plastic products	238	402	350	/e
361 Pottery, china and earthenware	79	87	63	/e
362 Glass and glass products	96	176	129	
369 Other non-metal mineral products	569	801	512	/e
371 Iron and steel	1178	1650	1111	
372 Non-ferrous metals	276	380	264	
381 Metal products	1847	2588	2006	
382 Non-electrical machinery	2780	3836	3486	
383 Electrical machinery	1782	2670	2571	
384 Transport equipment	2746	3852	2746	
385 Professional and scientific equipment	205	371	320	/e
390 Other manufacturing industries	108	164	98	/e

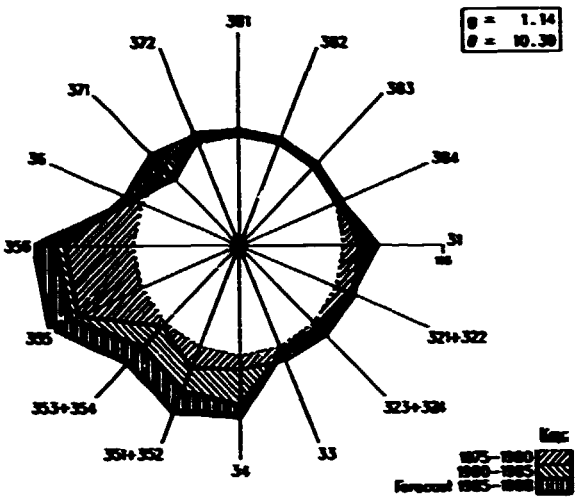




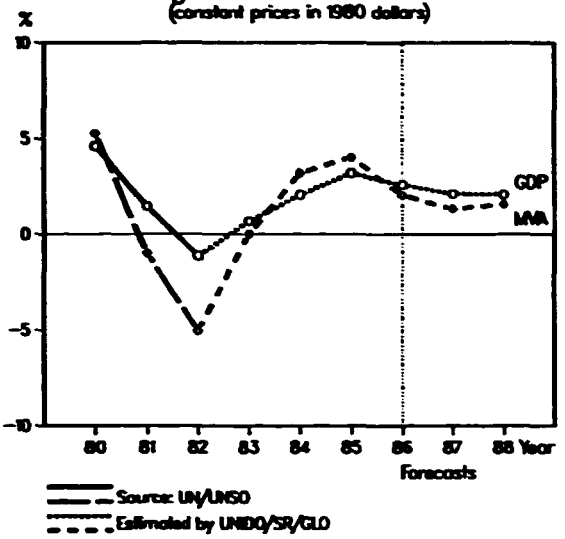


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

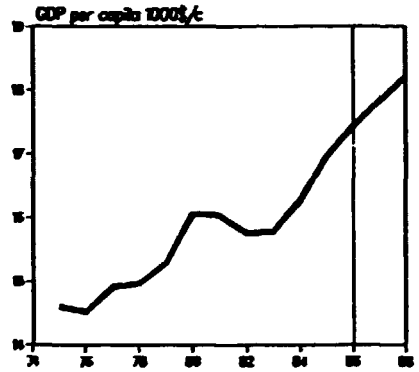


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

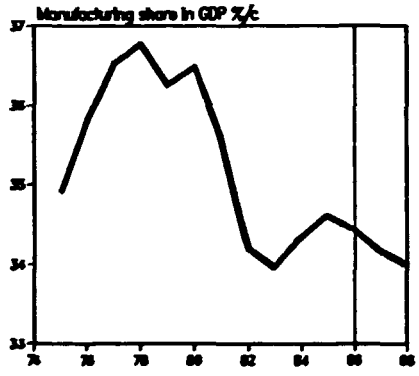


	1975	1980	1985
GDP: /na,c (in million dollars)	83479	101629	108075
Per capita /na,c (in dollars)	14686	16053	16866
Manufacturing share /na,c (%)	34.9	35.5	34.6
MANUFACTURING:			
Value added /na,c (in million dollars)	32531	37081	37407
Value added (in million dollars)	13360	...	...
Industrial production index	100	110	110
Gross output (in million dollars)	...	...	...
Employment (in thousands)	707	686	653
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	...	...	...
Wages and salaries (%)	...	...	...
Operating surplus (%)	...	...	...
-PRODUCTIVITY: (in dollars)			
Gross output / worker	...	...	...
Value added / worker	18889	...	...
Average wage	...	...	...
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	3.85	1.73	1.85
in percentage of θ in 1970-1975	169	71	76
Growth rate / structural change	-2.95	3.00	2.82
Degree of specialization	12.6	11.6	11.8
-VALUE ADDED: (in million dollars)			
311 Food products	1684	...	...
313 Beverages	329	...	...
314 Tobacco products	207	...	...
321 Textiles	549	...	...
322 Wearing apparel	416	...	...
323 Leather and fur products	47	...	...
324 Footwear	107	...	...
331 Wood and wood products	546	...	...
332 Furniture and fixtures	386	...	...
341 Paper and paper products	222	...	...
342 Printing and publishing	882	...	...
351 Industrial chemicals	784	...	...
352 Other chemical products	1036	...	...
353 Petroleum refineries	258	...	...
354 Miscellaneous petroleum and coal products	93	...	...
355 Rubber products	84	...	...
356 Plastic products	179	...	...
361 Pottery, china and earthenware	66	...	...
362 Glass and glass products	86	...	...
369 Other non-metal mineral products	318	...	...
371 Iron and steel	181	...	...
372 Non-ferrous metals	213	...	...
381 Metal products	910	...	...
382 Non-electrical machinery	1769	...	...
383 Electrical machinery	1340	...	...
384 Transport equipment	252	...	...
385 Professional and scientific equipment	579	...	...
390 Other manufacturing industries	67	...	...

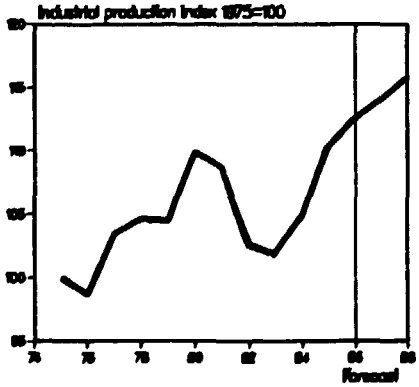
GDP per capita 1000$/c



Manufacturing share in GDP %/c

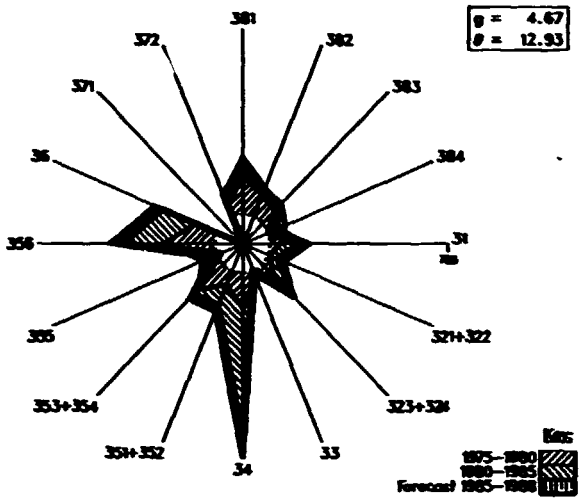


Industrial production index 1975=100

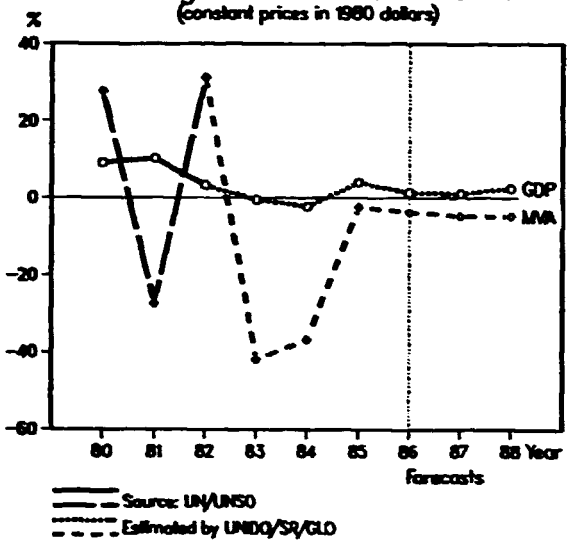


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(Index of value added: 1975=100)

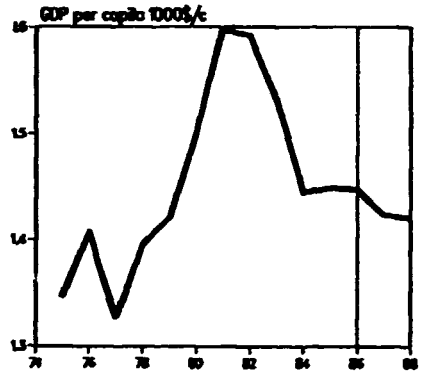


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



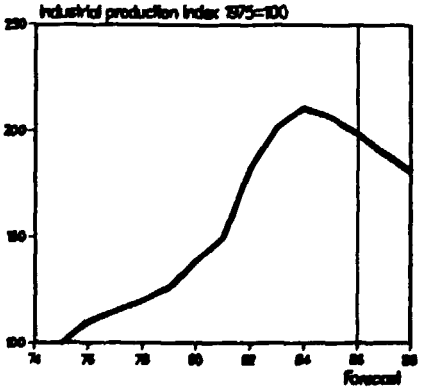
	1975	1980	1985
GDP: /na,c (in million dollars)	10014	13197	15222
Per capita /na,c (in dollars)	1346	1500	1449
Manufacturing share /na,c (%)	4.9	4.7	...
MANUFACTURING:			
Value added /na,c (in million dollars)	494	626	...
Value added (in million dollars)	547	1688	2495 /e
Industrial production index	100	138	206
Gross output (in million dollars)	1448	3993	8707 /e
Employment (in thousands)	166	196	224 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	62	58 /e	71 /e
Wages and salaries (%)	8	9 /e	7 /e
Operating surplus (%)	30	33 /e	22 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	9252	20416 /e	38924 /e
Value added / worker	3496	8629 /e	11155 /e
Average wage	767	1870 /e	2733 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	3.94	5.43	1.06
in percentage of θ in 1970-1975	97	134	26
Growth rate / structural change	2.82	1.82	-1.96
Degree of specialization	27.2	22.7	24.6
-VALUE ADDED: (in million dollars)			
311 Food products	94	350	387 /e
313 Beverages	11	43	40 /e
314 Tobacco products	26	96	93 /e
321 Textiles	191	326	321 /e
322 Wearing apparel	17	33	29 /e
323 Leather and fur products	8	20	19 /e
324 Footwear	32	61	66 /e
331 Wood and wood products	12	39	48 /e
332 Furniture and fixtures	28	88	104 /e
341 Paper and paper products	1	3	7 /e
342 Printing and publishing	6	7	16 /e
351 Industrial chemicals	1	8	23 /e
352 Other chemical products	19	143	198 /e
353 Petroleum refineries	16	150	211 /e
354 Miscellaneous petroleum and coal products	-	6	7 /e
355 Rubber products	5	69	88 /e
356 Plastic products	5	58	79 /e
361 Pottery, china and earthenware	1	6	9 /e
362 Glass and glass products	3	8	13 /e
369 Other non-metal mineral products	15	39	66 /e
371 Iron and steel	-	- /e	- /e
372 Non-ferrous metals	6	16 /e	22 /e
381 Metal products	32	77	367 /e
382 Non-electrical machinery	10	24	111 /e
383 Electrical machinery	4	10	48 /e
384 Transport equipment	1	1	6 /e
385 Professional and scientific equipment	-	-	- /e
390 Other manufacturing industries	6	10	127 /e

GDP per capita 1000$/c



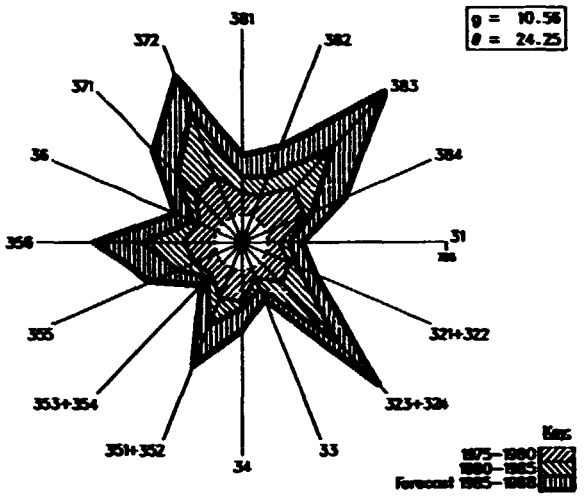
Manufacturing share in GDP %/c

Industrial production index 1975=100

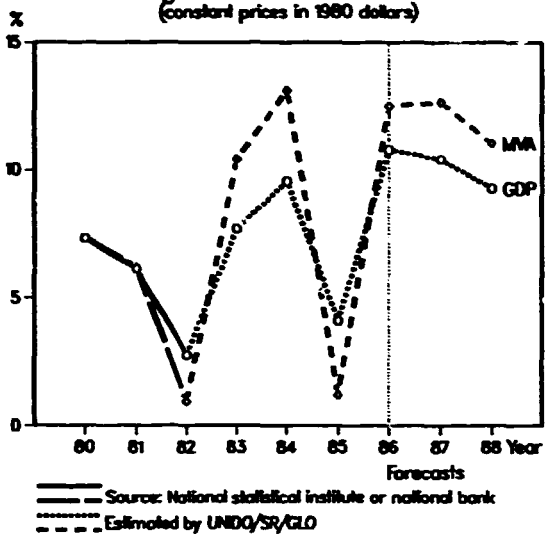


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

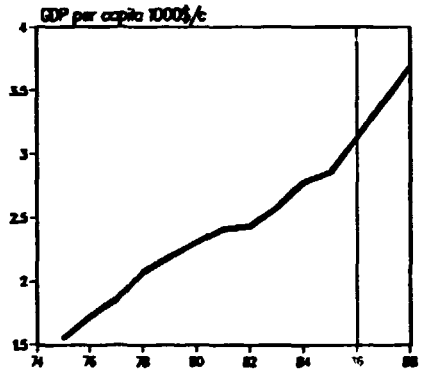


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

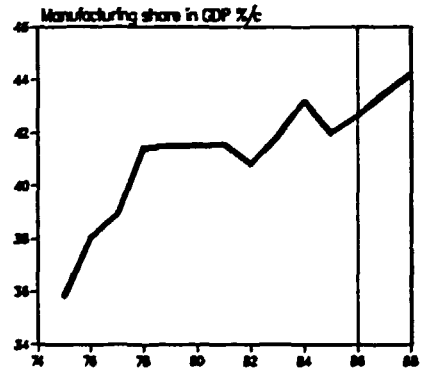


	1975	1980	1985
GDP: /na,c (in million dollars)	24760	40770	54619
Per capita /na,c (in dollars)	1547	2311	2858
Manufacturing share /na,c (%)	35.8	41.5	42.0
MANUFACTURING:			
Value added /na,c (in million dollars)	8864	16833	22943
Value added (in million dollars)	...	18000	27003
Industrial production index	100	189	252
Gross output (in million dollars)	...	55297	68144
Employment (in thousands)	...	...	...
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	...	...	...
Wages and salaries (%)	...	...	...
Operating surplus (%)	...	...	...
-PRODUCTIVITY: (in dollars)			
Gross output / worker	...	...	...
Value added / worker	...	...	...
Average wage	...	...	...
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	6.08 /e	3.85 /e	3.55 /e
in percentage of θ in 1970-1975	142 /e	90 /e	83 /e
Growth rate / structural change	1.88 /e	1.47 /e	0.32 /e
Degree of specialization	13.3 /e	12.6 /e	12.9 /e
-VALUE ADDED: (in million dollars)			
311 Food products	...	2143	3039
313 Beverages	...	339	429
314 Tobacco products	...	416	538
321 Textiles	...	2472	3113
322 Wearing apparel	...	415	548
323 Leather and fur products	...	168	193
324 Footwear	...	59	396
331 Wood and wood products	...	236	301
332 Furniture and fixtures	...	77	159
341 Paper and paper products	...	314	413
342 Printing and publishing	...	237	248
351 Industrial chemicals	...	1152	1953
352 Other chemical products	...	523	787
353 Petroleum refineries	...	458	547
354 Miscellaneous petroleum and coal products	...	24	33
355 Rubber products	...	317	471
356 Plastic products	...	1112	2021
361 Pottery, china and earthenware	...	118	176
362 Glass and glass products	...	123	167
369 Other non-metal mineral products	...	666	774
371 Iron and steel	...	744	1103
372 Non-ferrous metals	...	244	508
381 Metal products	...	1012	1446
382 Non-electrical machinery	...	779	1177
383 Electrical machinery	...	2084	3953
384 Transport equipment	...	1053	1299
385 Professional and scientific equipment	...	189	296
390 Other manufacturing industries	...	527	917

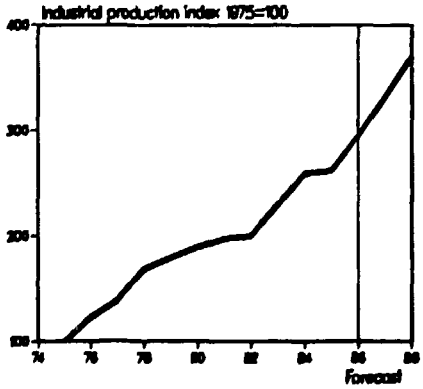
GDP per capita 1000$/c



Manufacturing share in GDP %/c

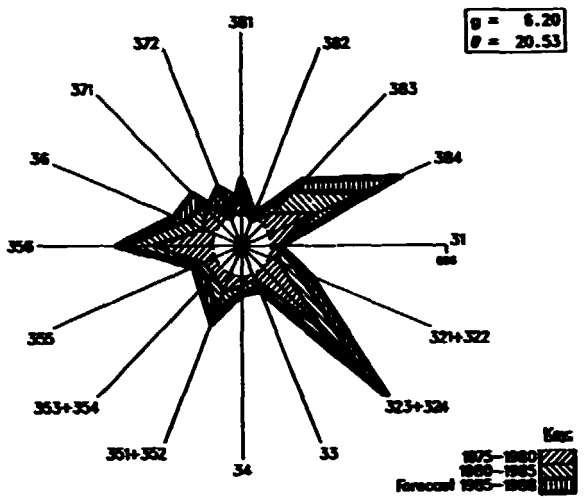


Industrial production index 1975=100

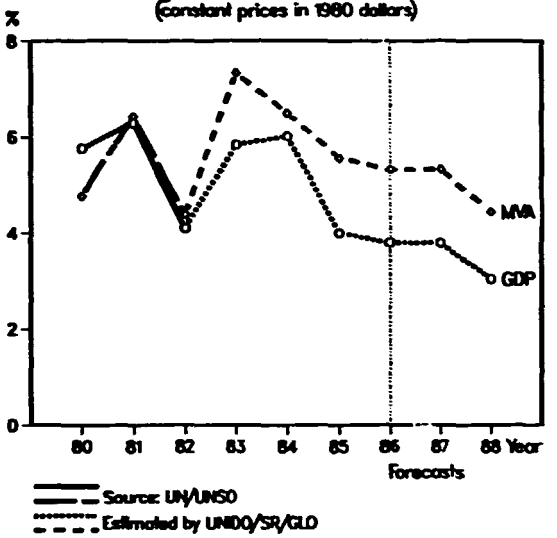


For source, footnotes and comments see "Technical notes" above.

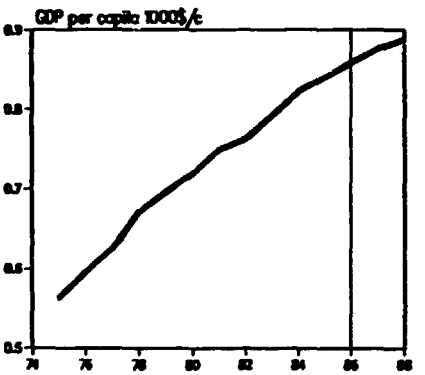
Industrial structural change
(index of value added: 1975=100)

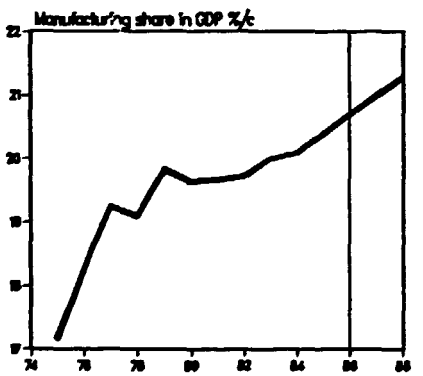


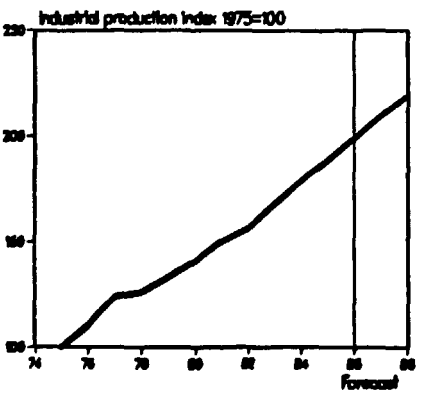
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	23246	33460	43186
Per capita /na,c (in dollars)	562	719	840
Manufacturing share /na,c (%)	17.2	19.6	20.4 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	3988	6569	8805 /e
Value added (in million dollars)	3878	9341	10423 /e
Industrial production index	100	141	189
Gross output (in million dollars)	11799	29256	32581 /e
Employment (in thousands)	1223	1533	1252 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	67	68	68 /e
Wages and salaries (%)	8	7	8 /e
Operating surplus (%)	25	25	24 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	9651	19082	25822 /e
Value added / worker	3172	6093	8261 /e
Average wage	785	1415	1981 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	13.25 /e	4.99 /e	3.48 /e
in percentage of θ in 1970-1975	135 /e	51 /e	36 /e
Growth rate / structural change	-0.04 /e	1.16 /e	1.60 /e
Degree of specialization	16.3 /e	14.5 /e	15.1 /e
-VALUE ADDED: (in million dollars)			
311 Food products	1129	1763	1821 /e
313 Beverages	277	698	772 /e
314 Tobacco products	186	361	393 /e
321 Textiles	410	1021	1008 /e
322 Wearing apparel	145	489	606 /e
323 Leather and fur products	18	24	24 /e
324 Footwear	23	53	64 /e
331 Wood and wood products	120	267	217 /e
332 Furniture and fixtures	52	113	137 /e
341 Paper and paper products	77	367	351 /e
342 Printing and publishing	41	80	88 /e
351 Industrial chemicals	55	171	214 /e
352 Other chemical products	123	347	475 /e
353 Petroleum refineries	192	561	518 /e
354 Miscellaneous petroleum and coal products	12	35	32 /e
355 Rubber products	112	301	248 /e
356 Plastic products	63	106	102 /e
361 Pottery, china and earthenware	11	33	41 /e
362 Glass and glass products	32	97	119 /e
369 Other non-metal mineral products	69	212	280 /e
371 Iron and steel	103	312	189 /e
372 Non-ferrous metals	46	138	83 /e
381 Metal products	72	220	224 /e
382 Non-electrical machinery	80	158	249 /e
383 Electrical machinery	69	319	346 /e
384 Transport equipment	215	661	981 /e
385 Professional and scientific equipment	7	20	33 /e
390 Other manufacturing industries	140	412	846 /e

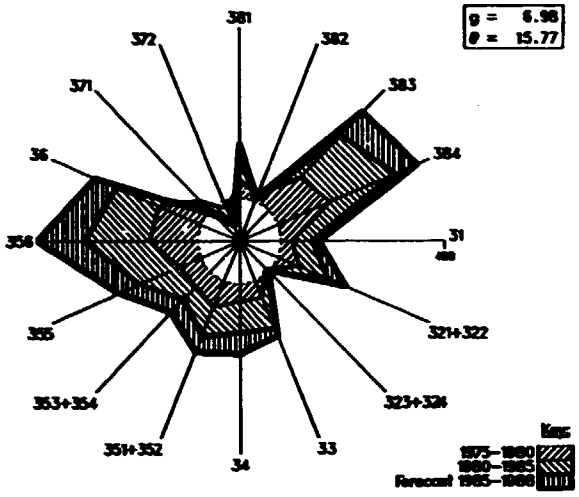




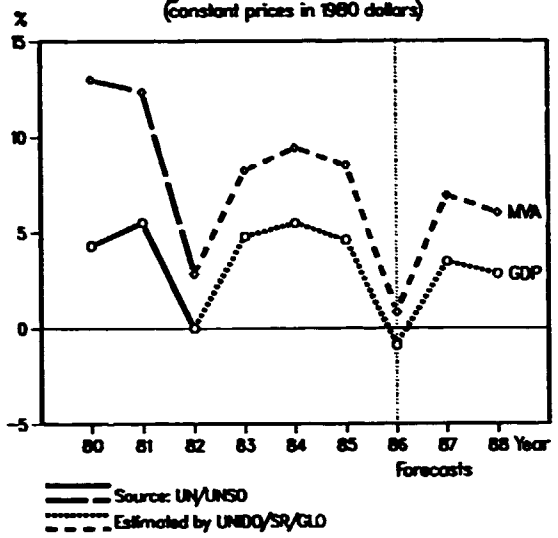


For source, footnotes and comments see "Technical notes" above.

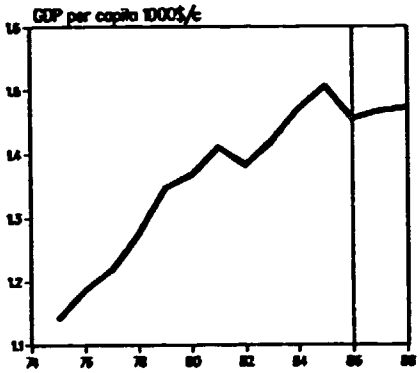
Industrial structural change
(index of value added: 1975=100)

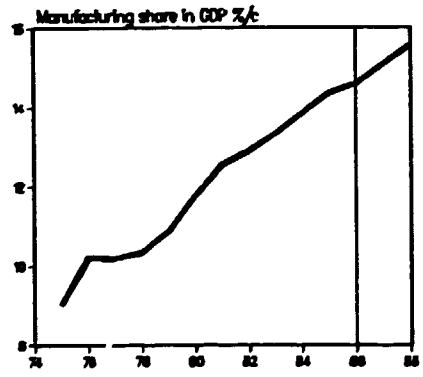


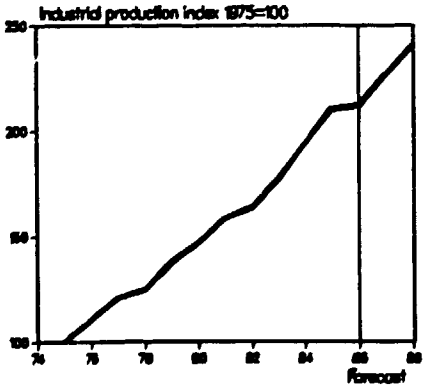
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	6398	8742	10867	
Per capita /na,c (in dollars)	1140	1368	1506	
Manufacturing share /na,c (%)	9.0	11.8	14.3	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	577	1030	1530	/e
Value added (in million dollars)	341	939	973	/e
Industrial production index	100	147	210	
Gross output (in million dollars)	1400	3679	3927	/e
Employment (in thousands)	77	125	161	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	76	74	75	/e
Wages and salaries (%)	12	12	12	/e
Operating surplus (%)	13	14	12	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	18113	28737	24362	/e
Value added / worker	4413	7642	6036	/e
Average wage	2132	3499	3016	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	6.36	5.16	0.77	
in percentage of θ in 1970-1975	126	103	15	
Growth rate / structural change	0.25	1.27	11.07	
Degree of specialization	14.9	14.1	14.7	
-VALUE ADDED: (in million dollars)				
311 Food products	54	96	71	/e
313 Beverages	20	49	55	/e
314 Tobacco products	11	22	24	/e
321 Textiles	28	55	67	/e
322 Wearing apparel	21	92	103	/e
323 Leather and fur products	5	6	7	/e
324 Footwear	8	21	21	/e
331 Wood and wood products	7	12	12	/e
332 Furniture and fixtures	4	13	13	/e
341 Paper and paper products	13	24	22	/e
342 Printing and publishing	9	17	17	/e
351 Industrial chemicals	15	42	33	/e
352 Other chemical products	35	95	78	/e
353 Petroleum refineries	7	13	10	/e
354 Miscellaneous petroleum and coal products	-	-	-	/e
355 Rubber products	4	8	10	/e
356 Plastic products	5	18	21	/e
361 Pottery, china and earthenware	4	11	9	/e
362 Glass and glass products	2	7	5	/e
369 Other non-metal mineral products	33	156	177	/e
371 Iron and steel	16	40	75	/e
372 Non-ferrous metals	4	8	5	/e
381 Metal products	11	53	73	/e
382 Non-electrical machinery	1	2	2	/e
383 Electrical machinery	8	26	33	/e
384 Transport equipment	12	30	25	/e
385 Professional and scientific equipment	-	1	1	/e
390 Other manufacturing industries	4	5	5	/e

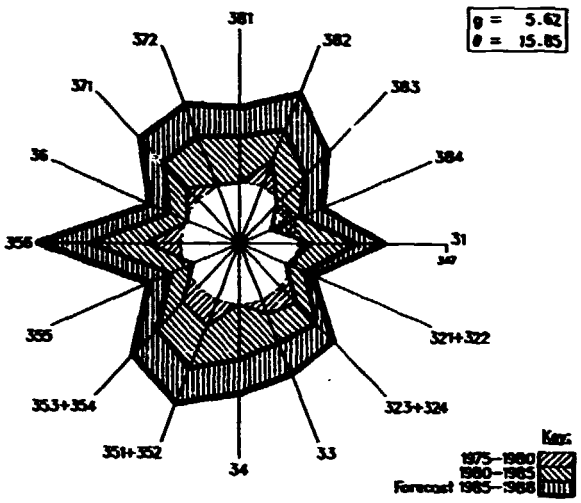




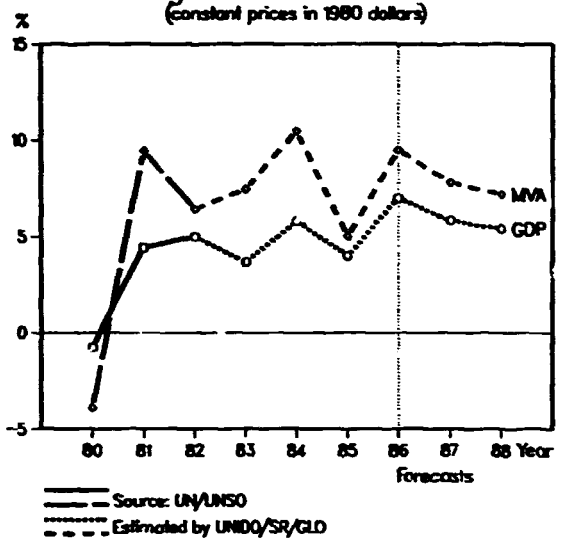


For source, footnotes and comments see "Technical notes" above.

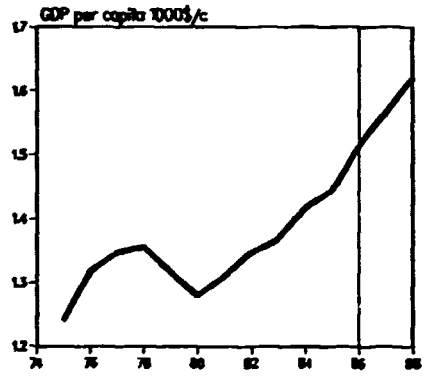
Industrial structural change
(index of value added: 1975=100)

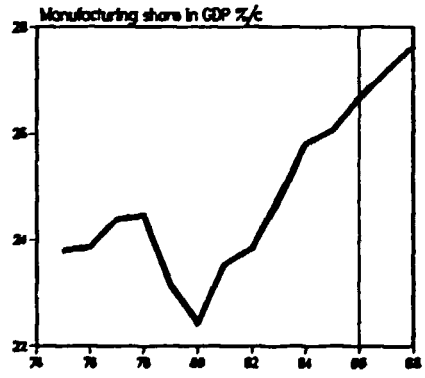


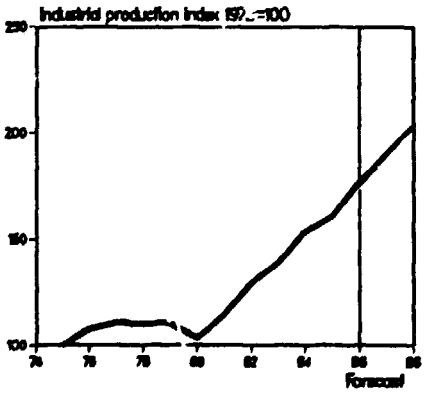
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	49622	58818	71156	
Per capita /na,c (in dollars)	1240	1280	1444	
Manufacturing share /na,c (%)	23.8	22.4	25.1	
MANUFACTURING:				
Value added /ra,c (in million dollars)	11807	12770	18542	
Value added (in million dollars)	6076	10830	11014	
Industrial production index	100	103	161	
Gross output (in million dollars)	17646	29408	32704	/e
Employment (in thousands)	700	787	835	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	66	63	66	/e
Wages and salaries (%)	11	11	9	/e
Operating surplus (%)	24	26	25	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	25080	37362	39169	/e
Value added / worker	8585	13760	13191	/e
Average wage	2780	4229	3407	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.67	6.26	2.96	
in percentage of θ in 1970-1975	58	99	47	
Growth rate / structural change	2.47	-1.02	1.69	
Degree of specialization	16.6	14.4	15.3	
-VALUE ADDED: (in million dollars)				
311 Food products	640	1185	957	/e
313 Beverages	191	335	339	/e
314 Tobacco products	483	467	896	/e
321 Textiles	785	1536	1302	/e
322 Wearing apparel	44	80	178	/e
323 Leather and fur products	25	25	31	/e
324 Footwear	14	33	28	/e
331 Wood and wood products	71	118	95	/e
332 Furniture and fixtures	15	16	21	/e
341 Paper and paper products	140	206	206	/e
342 Printing and publishing	83	97	145	/e
351 Industrial chemicals	314	713	410	/e
352 Other chemical products	244	387	330	/e
353 Petroleum refineries	915	1352	2153	/e
354 Miscellaneous petroleum and coal products	48	222	207	/e
355 Rubber products	71	201	183	/e
356 Plastic products	58	125	95	/e
361 Pottery, china and earthenware	39	93	85	/e
362 Glass and glass products	62	110	183	/e
369 Other non-metal mineral products	202	535	432	/e
371 Iron and steel	446	783	518	/e
372 Non-ferrous metals	100	292	201	/e
381 Metal products	210	395	342	/e
382 Non-electrical machinery	283	506	499	/e
383 Electrical machinery	206	463	460	/e
384 Transport equipment	364	541	671	/e
385 Professional and scientific equipment	5	8	13	/e
390 Other manufacturing industries	19	28	36	/e

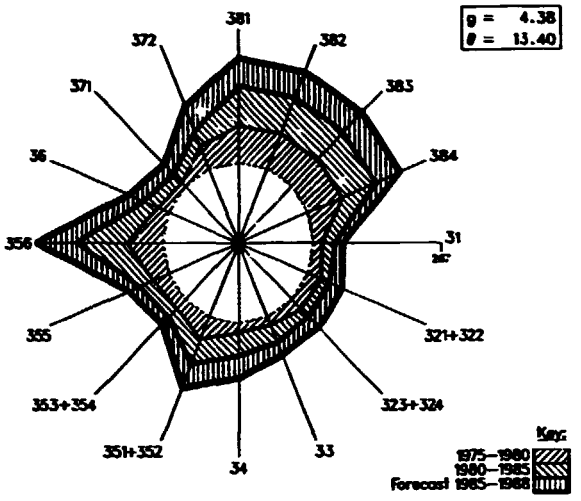




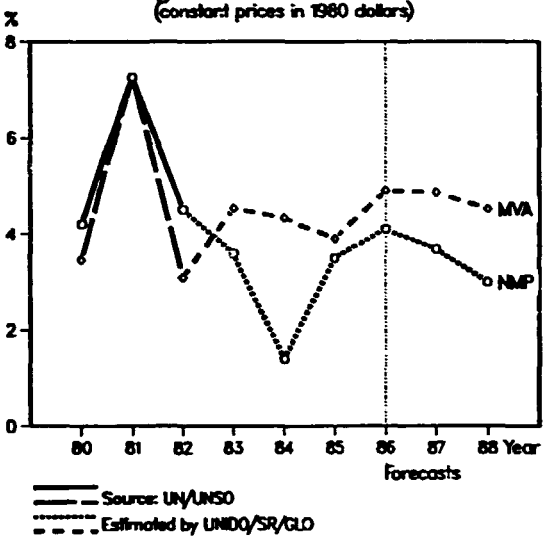


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

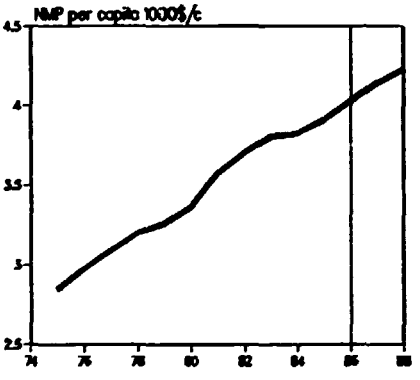


Annual growth rates of NMP and MVA
(constant prices in 1980 dollars)

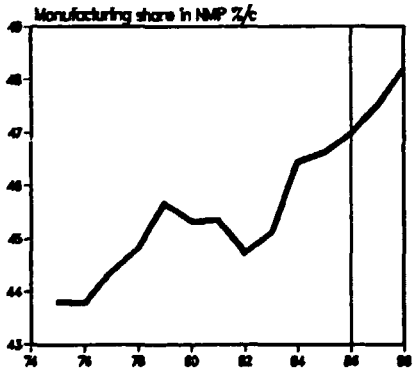


	1975	1980	1985
NMP: /na,c (in million dollars)	720808	893902	1089212
Per capita /na,c (in dollars)	2845	3367	3909
Manufacturing share /na,c (%)	43.8	45 3	46.6
MANUFACTURING:			
Value added /na,c (in million dollars)	315765	405190	507824
Value added (in million dollars)	...	...	...
Industrial production index	100	125	152
Gross output (in million dollars)	603997 /e	834090 /e	946456 /e
Employment (in thousands)	29696	31464	32556 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	...	...	...
Wages and salaries (%)	...	...	...
Operating surplus (%)	...	...	...
-PRODUCTIVITY: (in dollars)			
Gross output / worker	21118	27398	30049 /e
Value added / worker	...	...	...
Average wage	2490	3249	3168 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	1.73	1.67	1.46
in percentage of θ in 1970-1975	101	97	85
Growth rate / structural change	4.50	2.11	2.67
Degree of specialization	18.3	18.1	18.4
-VALUE ADDED: (in million dollars)			
311 Food products	...	...	...
313 Beverages	...	...	...
314 Tobacco products	...	...	...
321 Textiles	...	...	...
322 Wearing apparel	...	...	...
323 Leather and fur products	...	...	...
324 Footwear	...	...	...
331 Wood and wood products	...	...	...
332 Furniture and fixtures	...	...	...
341 Paper and paper products	...	...	...
342 Printing and publishing	...	...	...
351 Industrial chemicals	...	...	...
352 Other chemical products	...	...	...
353 Petroleum refineries	...	...	...
354 Miscellaneous petroleum and coal products	...	...	...
355 Rubber products	...	...	...
356 Plastic products	...	...	...
361 Pottery, china and earthenware	...	...	...
362 Glass and glass products	...	...	...
369 Other non-metal mineral products	...	...	...
371 Iron and steel	...	...	...
372 Non-ferrous metals	...	...	...
381 Metal products	...	...	...
382 Non-electrical machinery	...	...	...
383 Electrical machinery	...	...	...
384 Transport equipment	...	...	...
385 Professional and scientific equipment	...	...	...
390 Other manufacturing industries	...	...	...

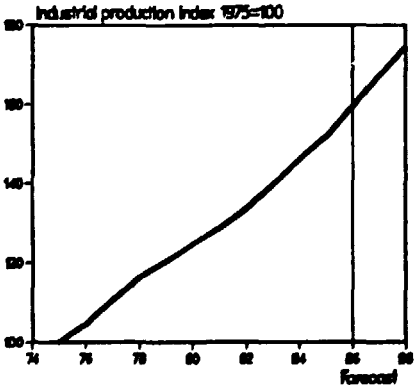
NMP per capita 1000$/c



Manufacturing share in NMP %/c

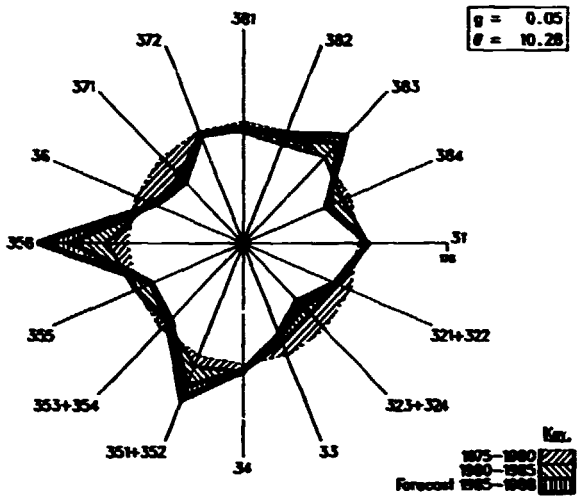


Industrial production index 1975=100

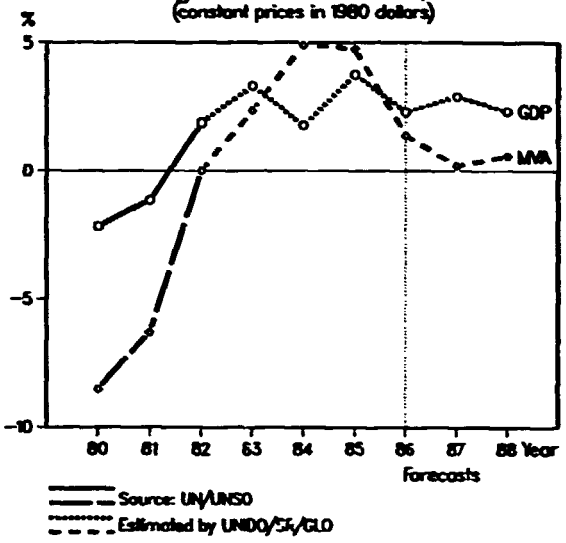


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)



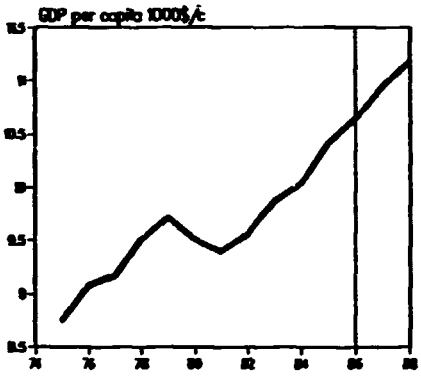
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



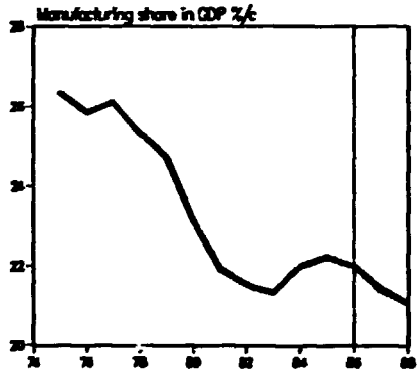
Source: UN/UNSO
Estimated by UNIDO/SS/GLO

	1975	1980	1985	
GDP: /na,c (in million dollars)	491712	533860	586408	
Per capita /na,c (in dollars)	8745	9509	10410	
Manufacturing share /na,c (%)	26.4	23.1	22.2	
MANUFACTURING:				
Value added /na,c (in million dollars)	129625	123670	130214	
Value added (in million dollars)	82065	163790	128835	
Industrial production index	100	96	99	
Gross output (in million dollars)	200488	400829	311073	/e
Employment (in thousands)	7394	6462	4979	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	59	59	59	/e
Wages and salaries (%)	21	20	18	/e
Operating surplus (%)	20	21	23	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	27115	62044	62479	/e
Value added / worker	11099	25347	25809	/e
Average wage	5689	12371	11123	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	2.74	3.25	2.21	
in percentage of θ in 1970-1975	115	137	93	
Growth rate / structural change	-2.22	-2.44	1.43	
Degree of specialization	11.5	11.4	12.2	
-VALUE ADDED: (in million dollars)				
311 Food products	7057	14744	12015	
313 Beverages	2644	5419	4109	
314 Tobacco products	889	1814	1475	
321 Textiles	3889	5419	3944	
322 Wearing apparel	1844	3395	2578	
323 Leather and fur products	356	558	342	
324 Footwear	600	1083	710	
331 Wood and wood products	1267	2349	1851	/e
332 Furniture and fixtures	1288	2568	1839	/e
341 Paper and paper products	2400	4860	3544	/e
342 Printing and publishing	3978	9814	8438	
351 Industrial chemicals	4911	8233	7520	/e
352 Other chemical products	2956	7512	6415	/e
353 Petroleum refineries	1978	4512	2437	
354 Miscellaneous petroleum and coal products	311	721	379	/e
355 Rubber products	1400	2349	1832	/e
356 Plastic products	1099	3888	2957	/e
361 Pottery, china and earthenware	444	977	755	/e
362 Glass and glass products	778	1442	886	
369 Other non-metal mineral products	2378	6888	4281	/e
371 Iron and steel	4244	6980	4432	
372 Non-ferrous metals	1267	2581	1787	
381 Metal products	5133	10140	7788	
382 Non-electrical machinery	9878	21326	16787	
383 Electrical machinery	6778	16209	12701	
384 Transport equipment	8867	17612	12776	
385 Professional and scientific equipment	1533	2209	1874	/e
390 Other manufacturing industries	1000	1731	1243	/e

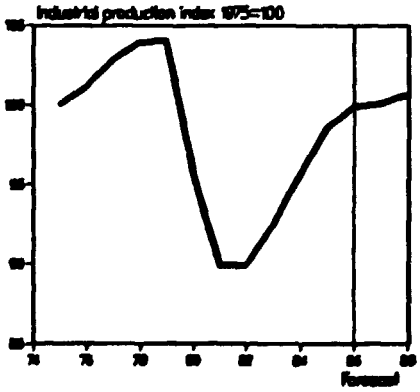
GDP per capita 1000$/c



Manufacturing share in GDP %/c

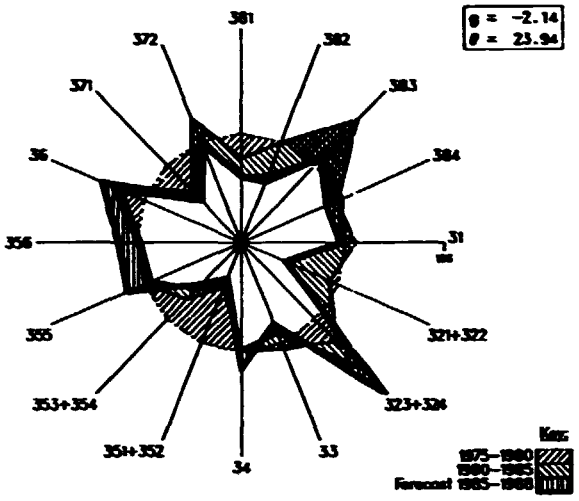


Industrial production index 1975=100

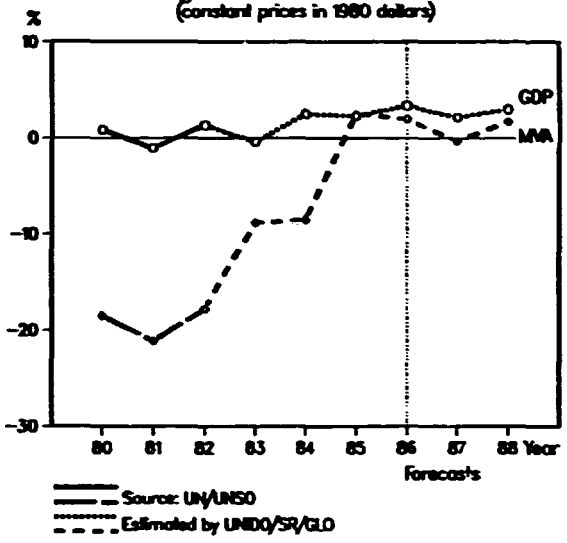


For source, footnotes and comments see "Technical notes" above.

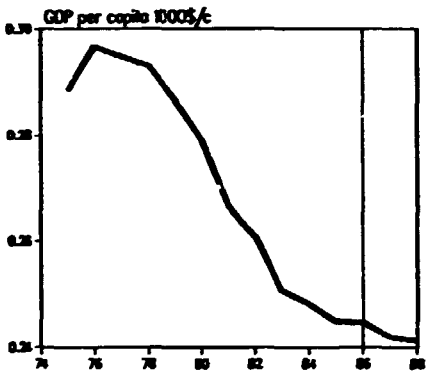
Industrial structural change
(index of value added: 1975=100)

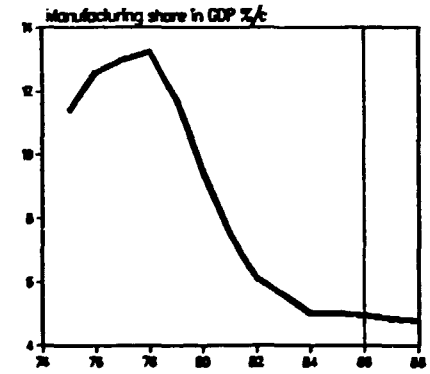


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



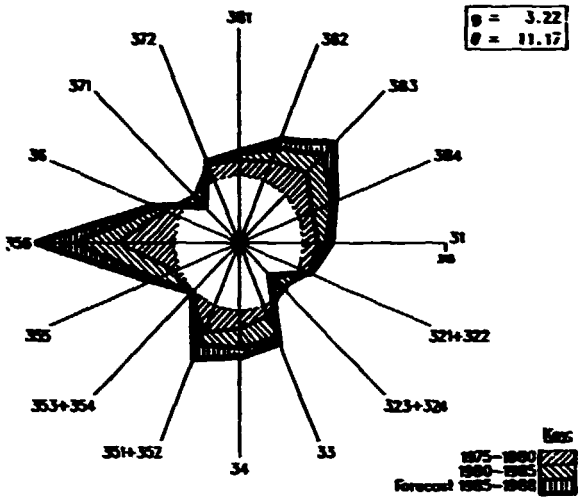
	1975	1980	1985
GDP: /na,c (in million dollars)	4585	5289	5507
Per capita /na,c (in dollars)	288	279	245
Manufacturing share /na,c (%)	11.4	9.5	5.0 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	522	500	277 /e
Value added (in million dollars)	165	355	354 /e
Industrial production index	100	92	73
Gross output (in million dollars)	802 /e	1266	1195 /e
Employment (in thousands)	76 /e	101	109 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	79 /e	72 /e	70 /e
Wages and salaries (%)	12 /e	9 /e	11 /e
Operating surplus (%)	9 /e	19 /e	19 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	10524 /e	12537 /e	10967 /e
Value added / worker	2171 /e	3514 /e	3251 /e
Average wage	1195 /e	1174 /e	1146 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	10.64	5.13	2.69
in percentage of θ in 1970-1975	133	64	34
Growth rate / structural change	1.10	-1.46	0.93
Degree of specialization	16.3	15.7	12.6
-VALUE ADDED: (in million dollars)			
311 Food products	33	58	58 /e
313 Beverages	9	8	17 /e
314 Tobacco products	12	12	33 /e
321 Textiles	29	95	57 /e
322 Wearing apparel	3	10	9 /e
323 Leather and fur products	3	7	4 /e
324 Footwear	3	8	14 /e
331 Wood and wood products	3	7	4 /e
332 Furniture and fixtures	2	6	4 /e
341 Paper and paper products	2	8	8 /e
342 Printing and publishing	9	14	14 /e
351 Industrial chemicals	5	11	16 /e
352 Other chemical products	5	10	8 /e
353 Petroleum refineries	8	15	12 /e
354 Miscellaneous petroleum and coal products	-	-	- /e
355 Rubber products	6	11	6 /e
356 Plastic products	4	8	4 /e
361 Pottery, china and earthenware	-	-	- /e
362 Glass and glass products	-	-	1 /e
369 Other non-metal mineral products	5	11	18 /e
371 Iron and steel	4 /e	4 /e	9 /e
372 Non-ferrous metals	1 /e	1 /e	3 /e
381 Metal products	6	20	23 /e
382 Non-electrical machinery	3	3	2 /e
383 Electrical machinery	3	6	6 /e
384 Transport equipment	6	19	20 /e
385 Professional and scientific equipment	-	-	- /e
390 Other manufacturing industries	2	2	3 /e



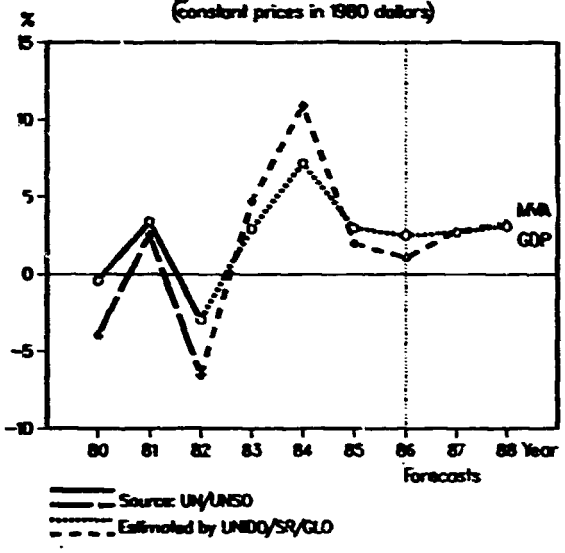


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

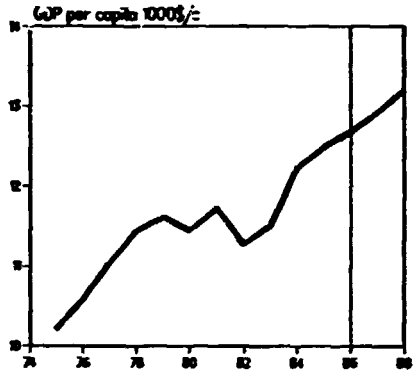


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

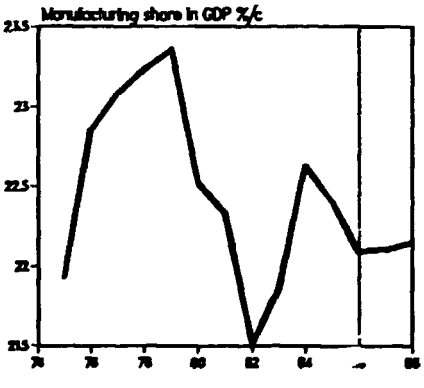


	1975	1980	1985	
GDP: /na,c (in million dollars)	2205760	2508530	2970751	
Per capita /na,c (in dollars)	10213	11446	12481	
Manufacturing share /na,c (%)	21.9	22.5	22.4	
MANUFACTURING:				
Value added /na,c (in million dollars)	483538	587073	865649	
Value added (in million dollars)	440769	769900	1072889	
Industrial production index	100	124	141	
Gross output (in million dollars)	1036097	1857100	2402370	/e
Employment (in thousands)	17108	19210	18450	
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	57	59	55	/e
Wages and salaries (%)	18	17	17	/e
Operating surplus (%)	24	24	28	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	60562	96674	130210	/e
Value added / worker	25764	40076	58978	/e
Average wage	11096	16406	22694	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.49	4.04	1.96	
in percentage of θ in 1970-1975	132	153	74	
Growth rate / structural change	-2.99	-1.46	1.36	
Degree of specialization	11.4	11.7	12.7	
-VALUE ADDED: (in million dollars)				
311 Food products	41090	63460	92290	
313 Beverages	7010	11810	16614	
314 Tobacco products	3720	6160	10447	
321 Textiles	14720	23030	29600	
322 Wearing apparel	12350	19780	25988	
323 Leather and fur products	1230	1850	1889	
324 Footwear	1900	2950	2486	
331 Wood and wood products	7710	12970	17824	/e
332 Furniture and fixtures	5270	9840	13410	/e
341 Paper and paper products	17940	29790	40487	/e
342 Printing and publishing	24640	44390	77465	
351 Industrial chemicals	24790	38920	52253	/e
352 Other chemical products	21010	35530	50719	/e
353 Petroleum refineries	8930	23010	19954	
354 Miscellaneous petroleum and coal products	1570	2670	3977	/e
355 Rubber products	6240	8030	12057	/e
356 Plastic products	7360	14540	24388	/e
361 Pottery, china and earthenware	730	1210	1537	/e
362 Glass and glass products	4250	6470	9186	/e
369 Other non-metal mineral products	9870	16300	20536	/e
371 Iron and steel	21870	30780	25110	
372 Non-ferrous metals	7470	14340	14944	
381 Metal products	30680	53180	71901	
382 Non-electrical machinery	52850	102760	134027	
383 Electrical machinery	36840	74860	119297	
384 Transport equipment	48650	81280	141466	
385 Professional and scientific equipment	14160	27940	42045	/e
390 Other manufacturing industries	7120	12060	16164	/e

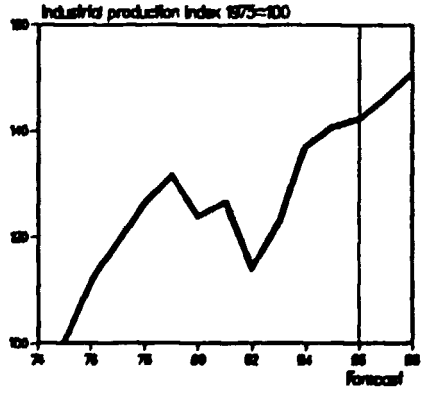
GDP per capita 1000$/=



Manufacturing share in GDP %/c

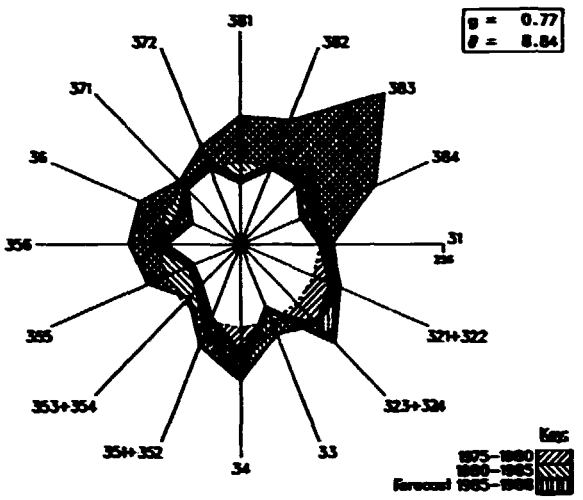


Industrial production index 1975=100

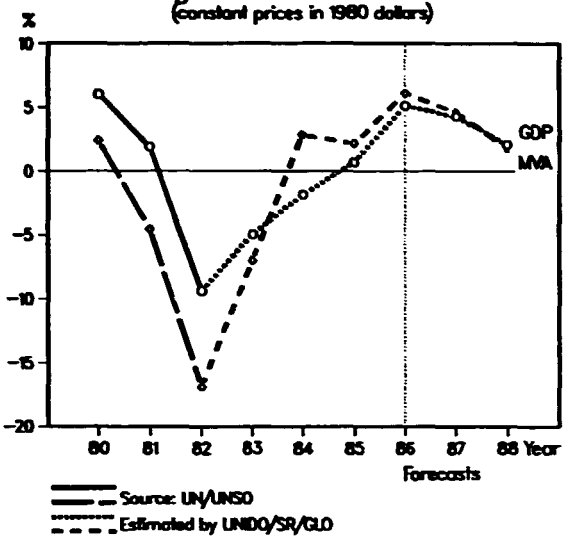


For source, footnotes and comments see "Technical notes" above.

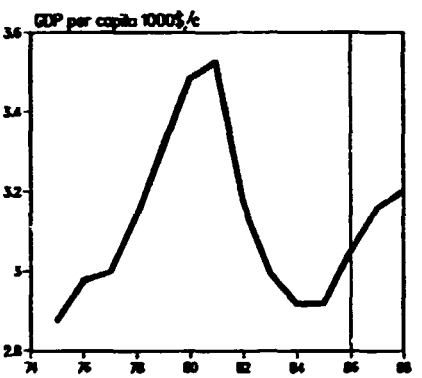
Industrial structural change
(index of value added: 1975=100)

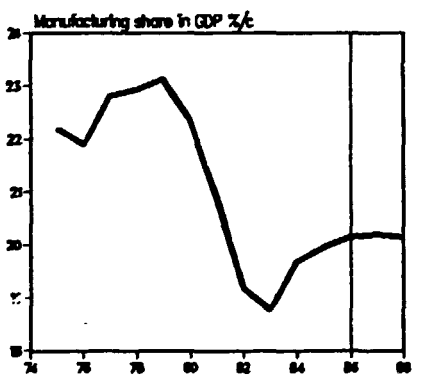


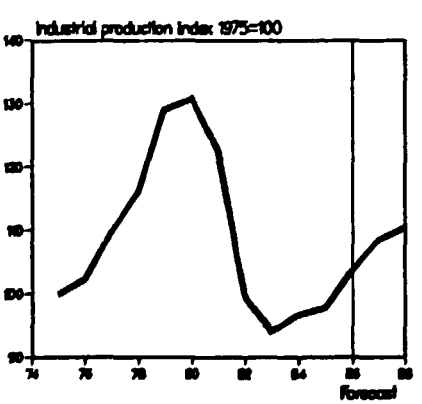
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	8131	10133	8789
Per capita /na,c (in dollars)	2874	3485	2918
Manufacturing share /na,c (%)	22.2	22.3	20.0 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	1805	2264	1764 /e
Value added (in million dollars)	1065	2183	1296 /e
Industrial production index	100	131	98
Gross output (in million dollars)	2678	5606	3158 /e
Employment (in thousands)	202	160	117 /e
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	60	61	59 /e
Wages and salaries (%)	12 /e	13	8 /e
Operating surplus (%)	27 /e	26	33 /e
-PRODUCTIVITY: (in dollars)			
Gross output / worker	13230	34992	27064 /e
Value added / worker	5263	13627	11101 /e
Average wage	1644 /e	4473	2201 /e
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	4.10	4.55	2.06
in percentage of θ in 1970-1975	90	100	45
Growth rate / structural change	0.92	0.29	0.49
Degree of specialization	13.3	11.7	14.9
-VALUE ADDED: (in million dollars)			
311 Food products	197	279	287 /e
313 Beverages	90	177	75 /e
314 Tobacco products	60	153	73 /e
321 Textiles	139	186	135 /e
322 Wearing apparel	44	100	44 /e
323 Leather and fur products	43	52	90 /e
324 Footwear	20	31	11 /e
331 Wood and wood products	12	23	11 /e
332 Furniture and fixtures	7	13	2 /e
341 Paper and paper products	27	51	51 /e
342 Printing and publishing	24	62	23 /e
351 Industrial chemicals	22	36	28 /e
352 Other chemical products	44	127	105 /e
353 Petroleum refineries	166	327	143 /e
354 Miscellaneous petroleum and coal products	2	3	1 /e
355 Rubber products	28	68	35 /e
356 Plastic products	8	40	20 /e
361 Pottery, china and earthenware	6	23	12 /e
362 Glass and glass products	12	23	7 /e
369 Other non-metal mineral products	20	70	28 /e
371 Iron and steel	5	16	14 /e
372 Non-ferrous metals	2	5	3 /e
381 Metal products	30	90	27 /e
382 Non-electrical machinery	15	27	10 /e
383 Electrical machinery	28	66	27 /e
384 Transport equipment	12	132	24 /e
385 Professional and scientific equipment	2	2	1 /e
390 Other manufacturing industries	8	13	5 /e

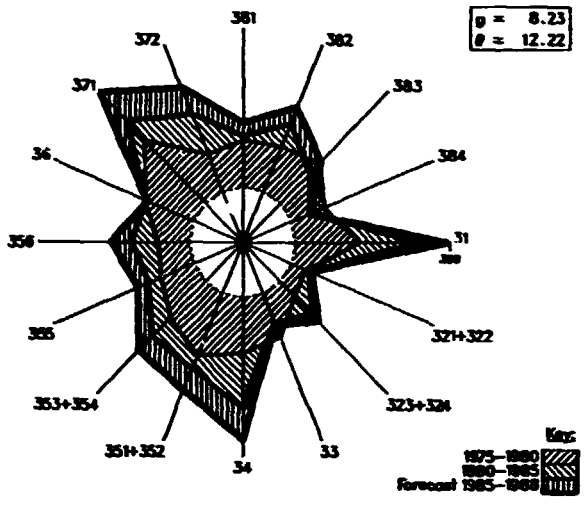




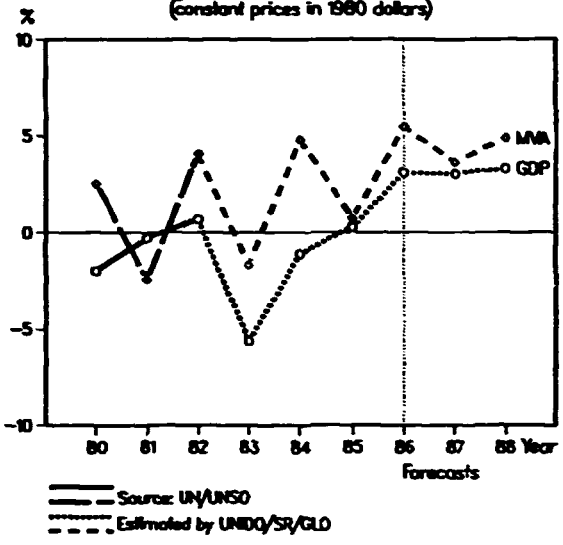


For source, footnotes and comments see "Technical notes" above.

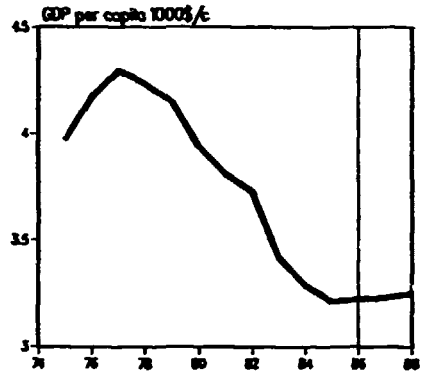
Industrial structural change
(index of value added: 1975=100)

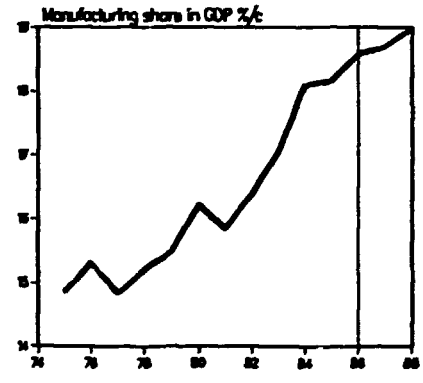


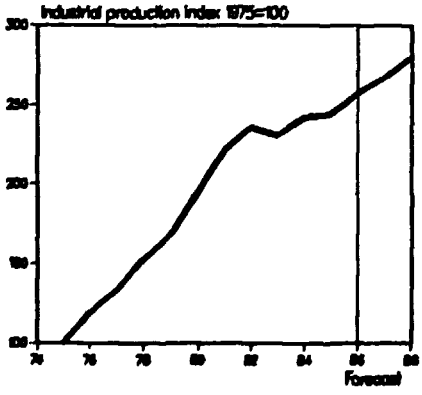
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	60283	59213	55627	
Per capita /na,c (in dollars)	3970	3941	3212	
Manufacturing share /na,c (%)	14.9	16.2	18.2	/e
MANUFACTURING:				
Value added /na,c (in million dollars)	7471	9596	10106	/e
Value added (in million dollars)	5658	14172	13203	/e
Industrial production index	100	195	244	
Gross output (in million dollars)	12587	29407	28907	/e
Employment (in thousands)	329	477	459	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	55	52	54	/e
Wages and salaries (%)	12	13	15	/e
Operating surplus (%)	33	35	31	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	38201	61639	63016	/e
Value added / worker	17202	29705	28783	/e
Average wage	4689	7932	9486	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	5.13	3.00	0.76	
in percentage of θ in 1970-1975	112	66	17	
Growth rate / structural change	-0.66	5.23	0.94	
Degree of specialization	21.2	21.9	24.6	
-VALUE ADDED: (in million dollars)				
311 Food products	722	1410	1818	/e
313 Beverages	374	992	984	/e
314 Tobacco products	105	331	536	/e
321 Textiles	345	483	330	/e
322 Wearing apparel	188	330	323	/e
323 Leather and fur products	30	55	45	/e
324 Footwear	56	147	213	/e
331 Wood and wood products	62	88	100	/e
332 Furniture and fixtures	83	167	182	/e
341 Paper and paper products	184	355	269	/e
342 Printing and publishing	147	364	295	/e
351 Industrial chemicals	112	275	534	/e
352 Other chemical products	379	881	661	/e
353 Petroleum refineries	1302	4417	2874	/e
354 Miscellaneous petroleum and coal products	12	24	21	/e
355 Rubber products	109	141	154	/e
356 Plastic products	138	379	348	/e
361 Pottery, china and earthenware	15	44	67	/e
362 Glass and glass products	67	136	101	/e
369 Other non-metal mineral products	171	441	446	/e
371 Iron and steel	211	632	862	/e
372 Non-ferrous metals	51	198	414	/e
381 Metal products	238	601	543	/e
382 Non-electrical machinery	81	217	307	/e
383 Electrical machinery	138	291	341	/e
384 Transport equipment	305	662	512	/e
385 Professional and scientific equipment	8	34	41	/e
390 Other manufacturing industries	26	68	84	/e

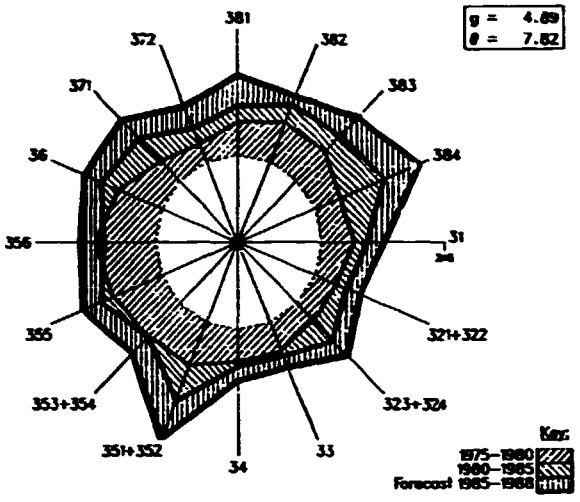




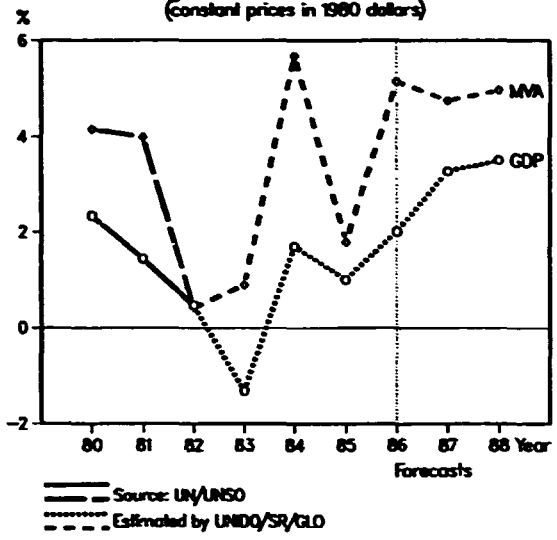


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

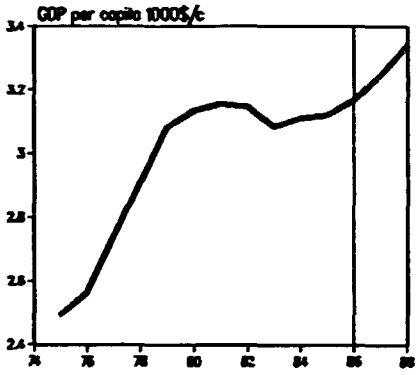


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

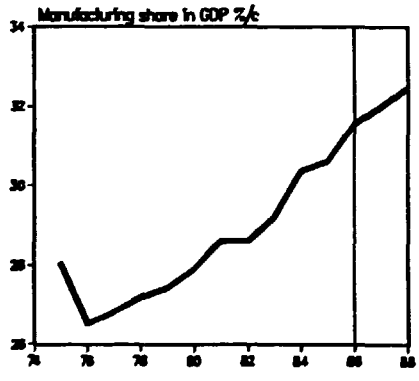


	1975	1980	1985	
GDP: /na,c (in million dollars)	53245	69958	72272	
Per capita /na,c (in dollars)	2494	3137	3121	
Manufacturing share /na,c (%)	28.1	27.9	30.6	
MANUFACTURING:				
Value added /na,c (in million dollars)	14943	19526	22128	
Value added (in million dollars)	9440	21750	16025	
Industrial production index	100	139	161	
Gross output (in million dollars)	32392	72628	55744	/e
Employment (in thousands)	1640	2106	2461	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	71	70	71	/e
Wages and salaries (%)	10	10	8	/e
Operating surplus (%)	19	20	20	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	19751	34486	22652	/e
Value added / worker	5756	10328	6512	/e
Average wage	2050	3646	1903	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	2.63	1.77	1.55	
in percentage of θ in 1970-1975	114	77	67	
Growth rate / structural change	2.26	1.76	1.15	
Degree of specialization	9.3	8.8	9.1	
-VALUE ADDED: (in million dollars)				
311 Food products	920	1897	1278	/e
313 Beverages	245	459	290	/e
314 Tobacco products	272	184	135	/e
321 Textiles	864	1759	1810	/e
322 Wearing apparel	351	903	733	/e
323 Leather and fur products	108	226	200	/e
324 Footwear	149	482	458	/e
331 Wood and wood products	320	977	548	/e
332 Furniture and fixtures	346	730	421	/e
341 Paper and paper products	242	529	406	/e
342 Printing and publishing	399	876	410	/e
351 Industrial chemicals	372	694	680	/e
352 Other chemical products	319	681	480	/e
353 Petroleum refineries	189	454	294	/e
354 Miscellaneous petroleum and coal products	37	101	90	/e
355 Rubber products	117	276	223	/e
356 Plastic products	138	413	281	/e
361 Pottery, china and earthenware	47	128	85	/e
362 Glass and glass products	71	163	109	/e
369 Other non-metal mineral products	409	906	430	/e
371 Iron and steel	414	1221	980	/e
372 Non-ferrous metals	268	480	464	/e
381 Metal products	885	2106	1364	/e
382 Non-electrical machinery	489	1828	1391	/e
383 Electrical machinery	626	1600	1203	/e
384 Transport equipment	741	1441	1151	/e
385 Professional and scientific equipment	75	101	88	/e
390 Other manufacturing industries	37	134	75	/e

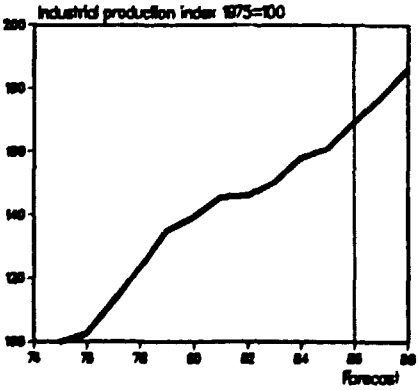
GDP per capita 1000$/c



Manufacturing share in GDP %/c

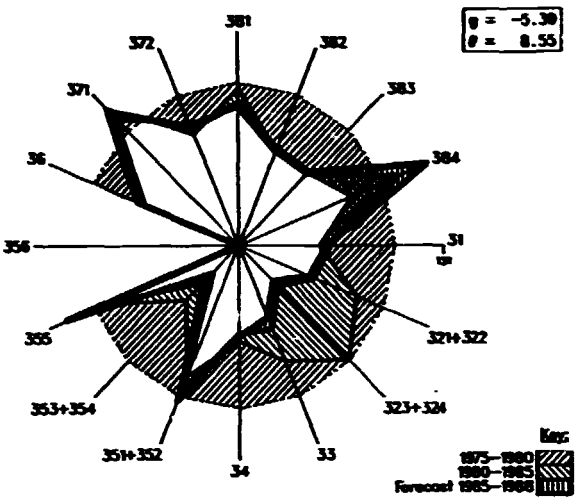


Industrial production index 1975=100

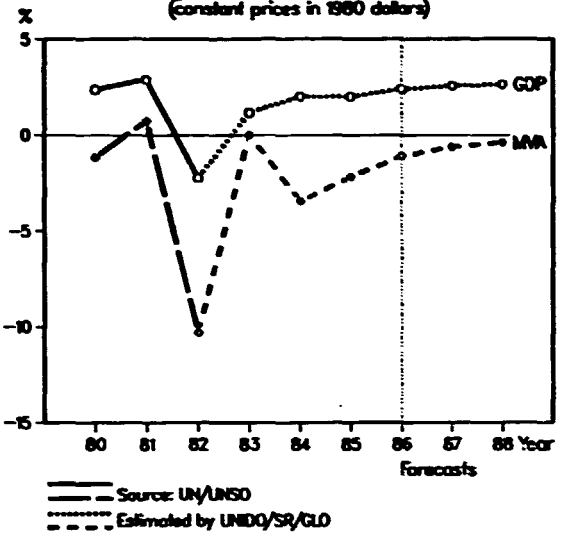


For source, footnotes and comments see "Technical notes" above.

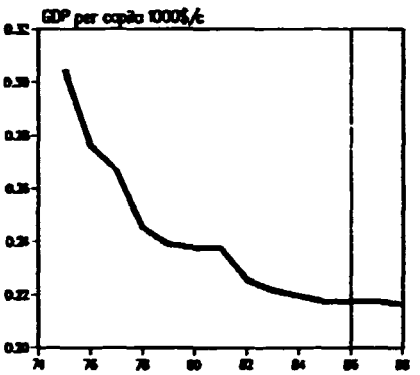
Industrial structural change
(index of value added: 1975=100)

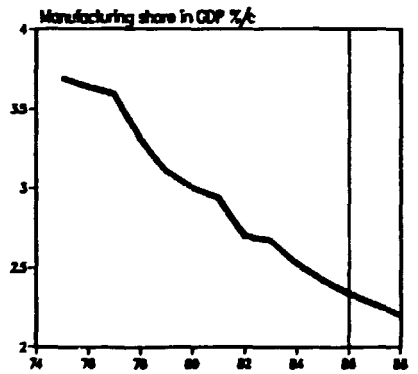


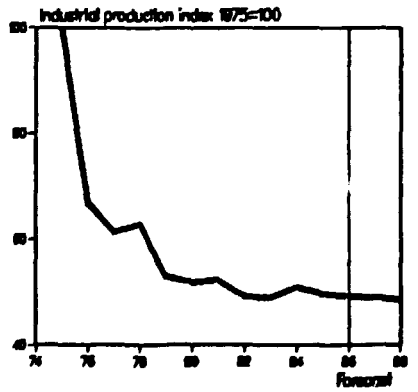
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985
GDP: /na,c (in million dollars)	6828	6145	6505
Per capita /na,c (in dollars)	305	238	217
Manufacturing share /na,c (%)	3.7	3.0	2.4 /e
MANUFACTURING:			
Value added /na,c (in million dollars)	252	185	158 /e
Value added (in million dollars)	327*	...	...
Industrial production index	100	52	50
Gross output (in million dollars)	...	...	...
Employment (in thousands)	...	...	...
-PROFITABILITY: (in percent of gross output)			
Intermediate input (%)	...	...	...
Wages and salaries (%)	...	...	...
Operating surplus (%)	...	...	...
-PRODUCTIVITY: (in dollars)			
Gross output / worker	...	...	...
Value added / worker	...	...	...
Average wage	...	...	...
-STRUCTURAL INDICES:			
Structural change θ (in degrees)	21.62	9.02	2.11
in percentage of θ in 1970-1975	163	68	16
Growth rate / structural change	0.56	-0.25	-1.04
Degree of specialization	26.5	16.8	21.8
-VALUE ADDED: (in million dollars)			
311 Food products	40	...	...
313 Beverages	70	...	...
314 Tobacco products	19	...	...
321 Textiles	21	...	...
322 Wearing apparel	14	...	...
323 Leather and fur products	1	...	...
324 Footwear	17	...	...
331 Wood and wood products	8	...	...
332 Furniture and fixtures	2	...	...
341 Paper and paper products	1	...	...
342 Printing and publishing	4	...	...
351 Industrial chemicals	24	...	...
352 Other chemical products	1	...	...
353 Petroleum refineries	17	...	...
354 Miscellaneous petroleum and coal products	-	...	...
355 Rubber products	1	...	...
356 Plastic products	-	...	...
361 Pottery, china and earthenware	1	...	...
362 Glass and glass products	1	...	...
369 Other non-metal mineral products	8	...	...
371 Iron and steel	5 /e	...	...
372 Non-ferrous metals	7 /e	...	...
381 Metal products	9	...	...
382 Non-electrical machinery	10	...	...
383 Electrical machinery	6	...	...
384 Transport equipment	10	...	...
385 Professional and scientific equipment	-	...	...
390 Other manufacturing industries	30	...	...

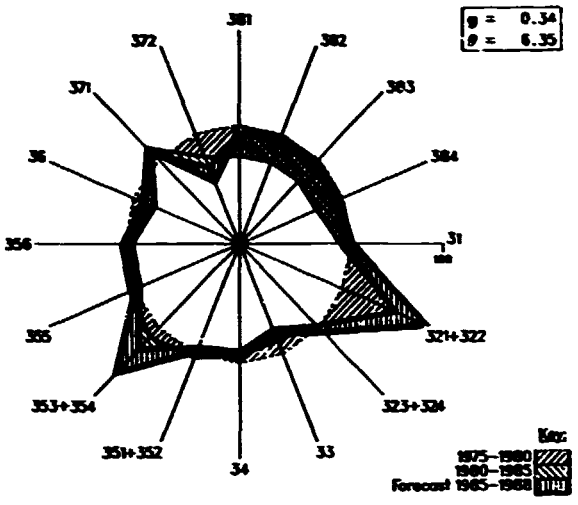




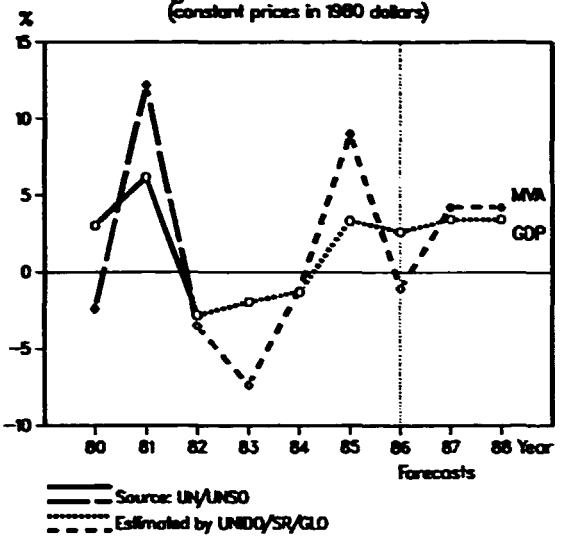


For source, footnotes and comments see "Technical notes" above.

Industrial structural change
(index of value added: 1975=100)

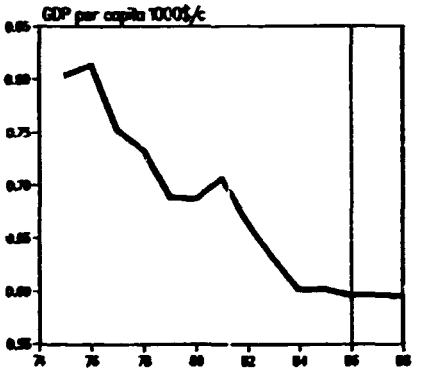


Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)

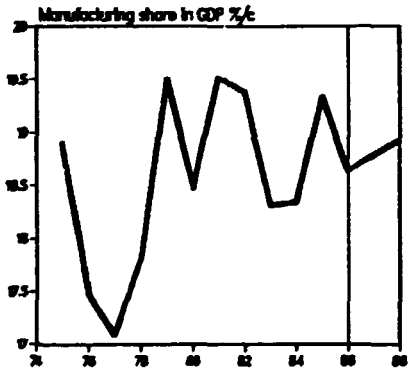


	1975	1980	1985	
GDP: /na,c (in million dollars)	3891	3883	4008	
Per capita /na,c (in dollars)	804	687	601	
Manufacturing share /na,c (%)	18.9	18.5	19.3	
MANUFACTURING:				
Value added /na,c (in million dollars)	736	717	775	
Value added (in million dollars)	483	780	626	
Industrial production index	100	94	97	
Gross output (in million dollars)	1087	1671	1487	/e
Employment (in thousands)	56	59	67	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	56	53	58	/e
Wages and salaries (%)	13	11	11	/e
Operating surplus (%)	31	36	31	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	19534	28427	22316	/e
Value added / worker	8672	13266	9380	/e
Average wage	2607	3261	2397	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	3.15	3.13	0.33	
in percentage of θ in 1970-1975	114	113	12	
Growth rate / structural change	-1.24	2.17	27.63	
Degree of specialization	17.5	16.6	17.4	
-VALUE ADDED: (in million dollars)				
311 Food products	44	92	77	/e
313 Beverages	121	193	153	/e
314 Tobacco products	36	58	51	/e
321 Textiles	15	51	46	/e
322 Wearing apparel	23	34	24	/e
323 Leather and fur products	1	3	2	/e
324 Footwear	6	16	15	/e
331 Wood and wood products	10	8	6	/e
332 Furniture and fixtures	10	12	10	/e
341 Paper and paper products	8	15	9	/e
342 Printing and publishing	12	17	12	/e
351 Industrial chemicals	15	22	20	/e
352 Other chemical products	32	47	39	/e
353 Petroleum refineries	11	9	4	/e
354 Miscellaneous petroleum and coal products	4	3	2	/e
355 Rubber products	17	20	16	/e
356 Plastic products	4	7	5	/e
361 Pottery, china and earthenware	1	1	1	/e
362 Glass and glass products	2	3	3	/e
369 Other non-metal mineral products	21	33	22	/e
371 Iron and steel	6	10	7	/e
372 Non-ferrous metals	1	2	1	/e
381 Metal products	35	50	37	/e
382 Non-electrical machinery	12	18	13	/e
383 Electrical machinery	10	26	24	/e
384 Transport equipment	24	28	24	/e
385 Professional and scientific equipment	-	-	-	/e
390 Other manufacturing industries	2	2	2	/e

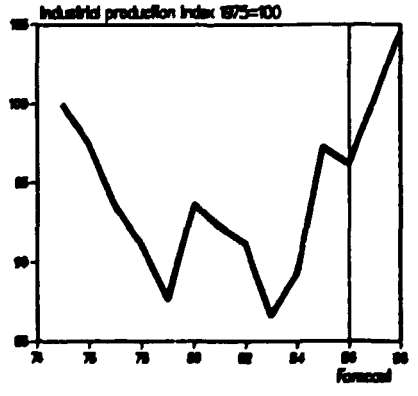
GDP per capita 1000$/c



Manufacturing share in GDP %/c

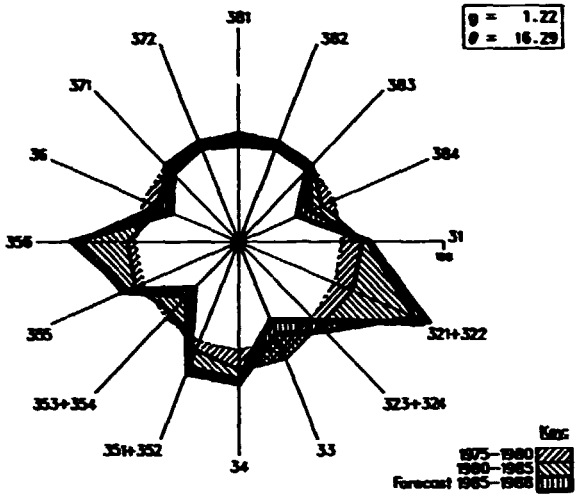


Industrial production index 1975=100

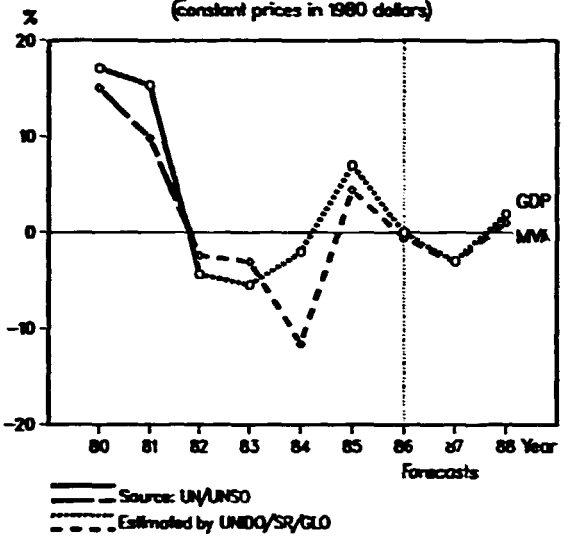


For source, footnotes and comments see "Technical notes" above.

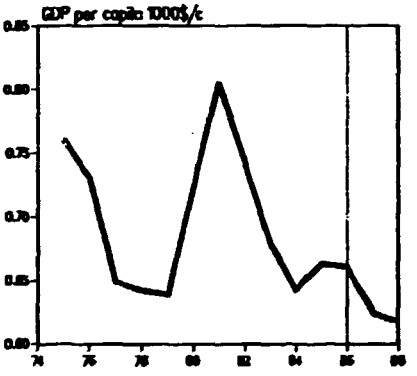
Industrial structural change
(index of value added: 1975=100)

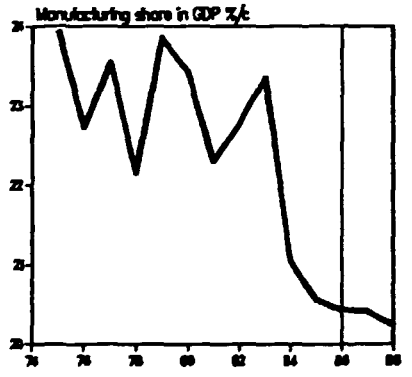


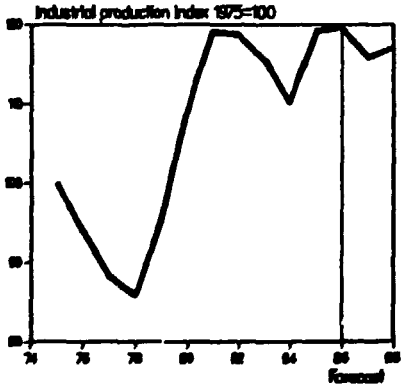
Annual growth rates of GDP and MVA
(constant prices in 1980 dollars)



	1975	1980	1985	
GDP: /na,c (in million dollars)	4732	5324	5820	
Per capita /na,c (in dollars)	761	723	663	
Manufacturing share /na,c (%)	23.9	23.4	20.6	
MANUFACTURING:				
Value added /na,c (in million dollars)	1133	1247	1196	
Value added (in million dollars)	929	1480	1310	
Industrial production index	100	109	119	
Gross output (in million dollars)	2320	3579	3214	/e
Employment (in thousands)	152	161	180	/e
-PROFITABILITY: (in percent of gross output)				
Intermediate input (%)	60	59	59	/e
Wages and salaries (%)	17	17	20	/e
Operating surplus (%)	23	24	21	/e
-PRODUCTIVITY: (in dollars)				
Gross output / worker	15264	22265	17813	/e
Value added / worker	6114	9205	7258	/e
Average wage	2585	3848	3594	/e
-STRUCTURAL INDICES:				
Structural change θ (in degrees)	2.05	3.50	9.44	
in percentage of θ in 1970-1975	92	157	424	
Growth rate / structural change	-0.73	4.12	0.86	
Degree of specialization	13.4	13.8	16.1	
-VALUE ADDED: (in million dollars)				
311 Food products	95	193	184	
313 Beverages	65	92	87	/e
314 Tobacco products	29	55	48	/e
321 Textiles	72	147	164	
322 Wearing apparel	54	70	73	/e
323 Leather and fur products	2	3	3	/e
324 Footwear	20	34	43	/e
331 Wood and wood products	14	38	25	/e
332 Furniture and fixtures	17	25	21	/e
341 Paper and paper products	25	30	29	/e
342 Printing and publishing	38	59	51	/e
351 Industrial chemicals	45	58	46	/e
352 Other chemical products	50	80	81	/e
353 Petroleum refineries	-	-	-	/e
354 Miscellaneous petroleum and coal products	3	7	6	/e
355 Rubber products	19	30	29	/e
356 Plastic products	16	25	25	/e
361 Pottery, china and earthenware	1	3	3	/e
362 Glass and glass products	3	9	11	/e
369 Other non-metal mineral products	39	44	41	/e
371 Iron and steel	119	187	97	/e
372 Non-ferrous metals	11	17	9	/e
381 Metal products	83	120	98	/e
382 Non-electrical machinery	35	51	50	/e
383 Electrical machinery	27	44	48	/e
384 Transport equipment	34	38	18	
385 Professional and scientific equipment	1	1	1	/e
390 Other manufacturing industries	11	18	16	/e







For source, footnotes and comments see "Technical notes" above.

AFGHANISTAN	1975	1980	1985	1987	1988
MMP: /na,c (in million dollars)	3423	3503	3799	3921 /f	3987 /f
Growth rate /na,c (%)	5.26	-2.75	0.20	2.18 /f	1.69 /f
Per capita /na,c (in dollars)	222.6	218.1	230.0	225.4 /f	223.2 /f
MVA: /na,c (in million dollars)	196	233	266 /e	287 /f	299 /f
Growth rate /na,c (%)	7.48	-2.14	3.21 /e	4.46 /f	4.05 /f
Manufacturing share /na,c (%)	5.7	6.7	7.0 /e	7.3 /f	7.5 /f

ALBANIA	1975	1980	1985	1987	1988
MMP: /na,c (in million dollars)	2086	2850	3643 /e	3868 /f	3993 /f
Growth rate /na,c (%)	5.88	6.29	2.77 /e	3.14 /f	3.24 /f
Per capita /na,c (in dollars)	860.6	1043.6	1194.6 /e	1216.8 /f	1230.4 /f
MVA: /na,c (in million dollars)	807	1130	1483 /e	1662 /f	1762 /f
Growth rate /na,c (%)	4.99	6.08	5.36 /e	5.94 /f	6.02 /f
Manufacturing share /na,c (%)	38.7	39.7	40.7 /e	43.0 /f	44.1 /f

BAHAMAS	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	849	1166	1269	...	...
Growth rate /na,c (%)	-14.77	4.15	2.99	...	...
Per capita /na,c (in dollars)	4162.3	5550.9	5518.3	...	...
MVA: /na,c (in million dollars)	61	74	80 /e	...	...
Growth rate /na,c (%)	-9.73	4.40	2.99 /e	...	...
Manufacturing share /na,c (%)	7.2	6.3	6.3 /e	...	...

BARBADOS	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	687	861	837	888 /f	908 /f
Growth rate /na,c (%)	-2.09	3.86	0.26	2.94 /f	2.25 /f
Per capita /na,c (in dollars)	2792.7	3455.8	3309.5	3481.5 /f	3546.1 /f
MVA: /na,c (in million dollars)	67	91	79	95 /f	99 /f
Growth rate /na,c (%)	10.70	2.16	-8.70	4.60 /f	4.02 /f
Manufacturing share /na,c (%)	9.7	10.6	9.5	10.7 /f	10.9 /f

BELIZE	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	142	171	169	179 /f	184 /f
Growth rate /na,c (%)	0.71	4.39	1.02	3.24 /f	3.14 /f
Per capita /na,c (in dollars)	1080.2	1180.7	1037.4	1014.2 /f	1022.8 /f
MVA: /na,c (in million dollars)	19	22	24 /e	26 /f	27 /f
Growth rate /na,c (%)	-7.33	14.91	2.40 /e	5.14 /f	5.02 /f
Manufacturing share /na,c (%)	13.2	13.1	14.0 /e	14.5 /f	14.7 /f

BENIN	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1164	1163	1270	1318 /f	1345 /f
Growth rate /na,c (%)	-4.92	6.48	-5.00	2.06 /f	2.09 /f
Per capita /na,c (in dollars)	382.7	332.7	313.7	307.5 /f	309.5 /f
MVA: /na,c (in million dollars)	102	73	82 /e	82 /f	82 /f
Growth rate /na,c (%)	-7.84	7.43	-4.57 /e	0.02 /f	0.04 /f
Manufacturing share /na,c (%)	8.7	6.3	6.4 /e	6.2 /f	6.1 /f

For source, footnotes and comments see "Technical notes" above.

BERMUDA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	519	642	885	612 /f	622 /f
Growth rate /na,c (%)	3.74	4.95	0.88	1.76 /f	1.70 /f
Per capita /na,c (in dollars)	8238.1	9043.7	7535.7	7510.9 /f	7606.8 /f
MVA: /na,c (in million dollars)	67	86	87 /e	93 /f	96 /f
Growth rate /na,c (%)	0.97	4.17	4.69 /e	3.57 /f	3.36 /f
Manufacturing share /na,c (%)	13.0	13.5	14.6 /e	15.2 /f	15.5 /f

BHUTAN	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	123	129	169 /e	184 /f	191 /f
Growth rate /na,c (%)	6.38	-20.87	3.80 /e	4.14 /f	4.19 /f
Per capita /na,c (in dollars)	106.7	100.9	119.4 /e	124.1 /f	127.5 /f
MVA: /na,c (in million dollars)	2	3	5 /e	5 /f	6 /f
Growth rate /na,c (%)	-2.20	9.45	7.65 /e	7.64 /f	7.64 /f
Manufacturing share /na,c (%)	1.7	2.6	2.8 /e	3.0 /f	3.1 /f

BOTSWANA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	571	992	1686	1870 /f	...
Growth rate /na,c (%)	15.90	12.47	5.68	5.00 /f	...
Per capita /na,c (in dollars)	755.9	1084.3	1532.2	1606.5 /f	...
MVA: /na,c (in million dollars)	54	63	...	...	...
Growth rate /na,c (%)	28.16	26.71	...	...	...
Manufacturing share /na,c (%)	9.4	6.4	...	...	...

BRUNEI DARUSSALAM	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	2989	4848	4063	4413 /f	4619 /f
Growth rate /na,c (%)	0.36	-7.00	-0.28	4.56 /f	4.67 /f
Per capita /na,c (in dollars)	19157.7	24733.7	17215.3	17699.2 /f	17895.6 /f
MVA: /na,c (in million dollars)	424	573	352 /e	376 /f	390 /f
Growth rate /na,c (%)	31.79	-8.35	-0.98 /e	3.61 /f	3.70 /f
Manufacturing share /na,c (%)	14.2	11.8	8.7 /e	8.5 /f	8.4 /f

BURKINA FASO	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	967	1235	1142 /e	1211 /f	1246 /f
Growth rate /na,c (%)	2.38	6.82	1.21 /e	2.75 /f	2.87 /f
Per capita /na,c (in dollars)	173.7	200.5	164.5 /e	168.9 /f	166.2 /f
MVA: /na,c (in million dollars)	104	144	102 /e	102 /f	104 /f
Growth rate /na,c (%)	1.21	7.78	-8.52 /e	1.62 /f	1.89 /f
Manufacturing share /na,c (%)	10.8	11.7	8.9 /e	8.5 /f	8.4 /f

BURMA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	4304	5861	7803	8410 /f	8706 /f
Growth rate /na,c (%)	4.15	7.94	5.22	4.15 /f	4.21 /f
Per capita /na,c (in dollars)	141.4	173.5	210.0	215.4 /f	219.0 /f
MVA: /na,c (in million dollars)	423	668	767 /e	806 /f	837 /f
Growth rate /na,c (%)	9.29	7.46	4.90 /e	3.09 /f	3.77 /f
Manufacturing share /na,c (%)	9.8	9.5	9.7 /e	9.6 /f	9.5 /f

For source, footnotes and comments see "Technical notes" above.

BURUNDI	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	757	961	1059	1138 /f	1143 /f
Growth rate /na,c (%)	1.23	-0.67	8.65	5.44 /f	0.44 /f
Per capita /na,c (in dollars)	202.1	234.4	224.2	227.2 /f	221.4 /f
MVA: /na,c (in million dollars)	51	77	99 /e	113 /f	118 /f
Growth rate /na,c (%)	0.37	12.47	10.15 /e	8.05 /f	4.68 /f
Manufacturing share /na,c (%)	6.7	8.1	9.3 /e	9.9 /f	10.3 /f

CAPE VERDE	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	58	65	78 /e	80 /f	81 /f
Growth rate /na,c (%)	3.41	3.36	2.89 /e	1.14 /f	1.25 /f
Per capita /na,c (in dollars)	203.5	218.2	240.2 /e	238.4 /f	237.8 /f
MVA: /na,c (in million dollars)	3	4	...	...	...
Growth rate /na,c (%)	2.60	7.14	...	...	...
Manufacturing share /na,c (%)	5.7	5.6	...	...	...

CHAD	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1508	920	701	689 /f	...
Growth rate /na,c (%)	17.24	-4.93	16.81	-0.83 /f	...
Per capita /na,c (in dollars)	374.2	205.4	139.7	132.0 /f	...
MVA: /na,c (in million dollars)	111	84	51 /e	...	...
Growth rate /na,c (%)	7.41	-12.00	1.11 /e	...	...
Manufacturing share /na,c (%)	7.4	9.1	7.3 /e	...	...

CHINA	1975	1980	1985	1987	1988
NMP: /na,c (in million dollars)	212748	285255	443397	519616 /f	566852 /f
Growth rate /na,c (%)	8.32	6.39	12.30	7.22 /f	7.13 /f
Per capita /na,c (in dollars)	233.5	291.6	426.3	488.7 /f	517.9 /f
MVA: /na,c (in million dollars)	...	...	...	...	...
Growth rate /na,c (%)	...	...	...	...	...
Manufacturing share /na,c (%)	...	...	...	...	...

COMOROS	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	126	127	150 /e	157 /f	160 /f
Growth rate /na,c (%)	-11.71	7.29	2.17 /e	2.15 /f	2.23 /f
Per capita /na,c (in dollars)	388.8	332.3	338.5 /e	315 7 /f	312.1 /f
MVA: /na,c (in million dollars)	10	7	...	...	...
Growth rate /na,c (%)	-1.66	5.79	...	...	...
Manufacturing share /na,c (%)	8.0	5.2	...	...	...

CONGO	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1456	1706	2491	2584 /f	...
Growth rate /na,c (%)	0.77	12.97	-3.00	3.53 /f	...
Per capita /na,c (in dollars)	1077.0	1115.6	1431.7	1404.2 /f	...
MVA: /na,c (in million dollars)	84	128	143 /e	141 /f	...
Growth rate /na,c (%)	-1.59	17.31	-6.60 /e	0.63 /f	...
Manufacturing share /na,c (%)	5.8	7.5	5.7 /e	5.4 /f	...

For source, footnotes and comments see "Technical notes" above.

COSTA RICA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	3742	4831	4795	5139 /f	5351 /f
Growth rate /na,c (%)	2.10	0.75	0.95	4.05 /f	4.13 /f
Per capita /na,c (in dollars)	1904.4	2120.0	1844.2	1970.4 /f	2004.8 /f
MVA: /na,c (in million dollars)	573	899	882 /e	964 /f	1016 /f
Growth rate /na,c (%)	3.17	0.80	1.02 /e	5.28 /f	5.38 /f
Manufacturing share /na,c (%)	18.0	18.6	18.4 /e	18.8 /f	19.0 /f

COTE D'IVOIRE	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	7661	10576	10373	11350 /f	11865 /f
Growth rate /na,c (%)	8.04	6.50	4.90	5.10 /f	4.54 /f
Per capita /na,c (in dollars)	1117.4	1294.0	1057.4	1080.0 /f	1090.9 /f
MVA: /na,c (in million dollars)	894	1196	1327	1449 /f	1519 /f
Growth rate /na,c (%)	-1.40	3.50	10.38	5.36 /f	4.83 /f
Manufacturing share /na,c (%)	11.8	11.3	12.8	12.8 /f	12.8 /f

CUBA	1975	1980	1985	1987	1988
MMP: /na,c (in million dollars)	17887	20773	31253	32294 /f	33470 /f
Growth rate /na,c (%)	2.94	-5.21	4.58	2.58 /f	3.64 /f
Per capita /na,c (in dollars)	1916.7	2134.5	3113.4	3138.4 /f	3221.3 /f
MVA: /na,c (in million dollars)	7259	7835	14068 /e	14643 /f	15259 /f
Growth rate /na,c (%)	2.90	-3.24	7.05 /e	3.03 /f	4.21 /f
Manufacturing share /na,c (%)	40.6	37.7	45.0 /e	45.3 /f	45.6 /f

DJIBOUTI	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	348	339	392 /e	410 /f	420 /f
Growth rate /na,c (%)	11.28	-.72	2.51 /e	2.37 /f	2.39 /f
Per capita /na,c (in dollars)	1627.6	1094.8	1075.5 /e	1029.3 /f	1027.7 /f
MVA: /na,c (in million dollars)	24	29	28 /e	30 /f	30 /f
Growth rate /na,c (%)	9.29	2.98	1.92 /e	2.16 /f	2.23 /f
Manufacturing share /na,c (%)	7.0	8.4	7.3 /e	7.2 /f	7.2 /f

EQUATORIAL GUINEA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	128	61	66 /e	68 /f	...
Growth rate /na,c (%)	-28.07	-9.09	2.02 /e	2.09 /f	...
Per capita /na,c (in dollars)	400.0	173.3	167.3 /e	165.8 /f	...
MVA: /na,c (in million dollars)	9	3	...	...	...
Growth rate /na,c (%)	-8.46	-9.23	...	...	...
Manufacturing share /na,c (%)	6.9	4.9	...	...	...

FIJI	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1001	1204	1237	1311 /f	1364 /f
Growth rate /na,c (%)	2.26	-1.72	-2.90	1.24 /f	4.10 /f
Per capita /na,c (in dollars)	1737.5	1914.8	1790.6	1838.9 /f	1886.6 /f
MVA: /na,c (in million dollars)	101	132	128	114 /f	117 /f
Growth rate /na,c (%)	0.00	-7.95	-14.04	-3.46 /f	2.47 /f
Manufacturing share /na,c (%)	10.1	11.0	10.3	8.7 /f	8.6 /f

For source, footnotes and comments see "Technical notes" above.

FRENCH GUIANA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	204	183	147 /e	152 /f	156 /f
Growth rate /na,c (%)	-0.82	0.00	-2.91 /e	2.01 /f	2.50 /f
Per capita /na,c (in dollars)	3650.0	2652.2	1789.0 /e	1728.4 /f	1713.2 /f
MVA: /na,c (in million dollars)	9	11	11 /e	12 /f	12 /f
Growth rate /na,c (%)	0.98	4.17	2.45 /e	3.81 /f	4.25 /f
Manufacturing share /na,c (%)	4.2	6.0	7.4 /e	7.6 /f	7.8 /f

FRENCH POLYNESIA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	899	1140	1451 /e	1554 /f	1605 /f
Growth rate /na,c (%)	-4.90	0.48	3.84 /e	3.43 /f	3.33 /f
Per capita /na,c (in dollars)	6761.7	7702.0	8902.5 /e	9142.9 /f	9177.1 /f
MVA: /na,c (in million dollars)	71	91	124 /e	138 /f	146 /f
Growth rate /na,c (%)	5.89	1.77	4.75 /e	5.09 /f	5.34 /f
Manufacturing share /na,c (%)	7.9	8.0	8.6 /e	8.9 /f	9.1 /f

GABON	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	4400	4280	4499	5073 /f	5524 /f
Growth rate /na,c (%)	14.36	17.64	-2.00	8.49 /f	8.88 /f
Per capita /na,c (in dollars)	4386.4	4022.7	3908.7	4245.4 /f	4527.7 /f
MVA: /na,c (in million dollars)	189	280	...	...	...
Growth rate /na,c (%)	21.77	7.84	...	...	...
Manufacturing share /na,c (%)	4.3	6.5	...	...	...

GAMBIA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	259	240	253	274 /f	279 /f
Growth rate /na,c (%)	-4.46	-3.19	-8.70	1.86 /f	1.57 /f
Per capita /na,c (in dollars)	494.1	410.1	393.5	408.8 /f	405.7 /f
MVA: /na,c (in million dollars)	11	14	...	...	...
Growth rate /na,c (%)	38.09	92.36	...	...	...
Manufacturing share /na,c (%)	4.4	5.7	...	...	...

GUADELOUPE	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1123	1387	1530 /e	1635 /f	1679 /f
Growth rate /na,c (%)	-1.68	-4.68	5.12 /e	3.01 /f	2.67 /f
Per capita /na,c (in dollars)	3414.6	4240.7	4580.7 /e	4866.3 /f	4981.6 /f
MVA: /na,c (in million dollars)	...	...	..	...	...
Growth rate /na,c (%)	...	...	...	...	...
Manufacturing share /na,c (%)	...	...	...	...	...

GUINEA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1494	1764	2035	2113 /f	2155 /f
Growth rate /na,c (%)	2.90	5.60	2.60	1.20 /f	2.03 /f
Per capita /na,c (in dollars)	308.0	326.2	334.9	333.2 /f	332.6 /f
MVA: /na,c (in million dollars)	47	66	66 /e	70 /f	71 /f
Growth rate /na,c (%)	-5.22	2.70	2.76 /e	2.14 /f	2.66 /f
Manufacturing share /na,c (%)	3.2	3.1	3.3 /e	3.3 /f	3.3 /f

For source, footnotes and comments see "Technical notes" above.

GUINEA-BISSAU	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	166	164	174 /e	180 /f	183 /f
Growth rate /na,c (%)	3.10	-4.17	-0.74 /e	2.33 /f	1.50 /f
Per capita /na,c (in dollars)	248.5	190.4	185.2 /e	184.0 /f	182.9 /f
MVA: /na,c (in million dollars)	3	3	3 /e	3 /f	3 /f
Growth rate /na,c (%)	3.44	-5.08	0.89 /e	1.29 /f	1.21 /f
Manufacturing share /na,c (%)	1.7	1.9	1.8 /e	1.8 /f	1.7 /f

GUYANA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	604	582	510	527 /f	535 /f
Growth rate /na,c (%)	10.40	1.85	1.01	1.85 /f	1.65 /f
Per capita /na,c (in dollars)	774.1	683.8	534.7	538.9 /f	541.1 /f
MVA: /na,c (in million dollars)	52	64	...	...	...
Growth rate /na,c (%)	13.42	0.76	...	...	...
Manufacturing share /na,c (%)	8.7	10.7	...	...	...

HAITI	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1109	1462	1423	1422 /f	1451 /f
Growth rate /na,c (%)	1.12	7.20	1.09	1.48 /f	2.03 /f
Per capita /na,c (in dollars)	215.1	251.6	216.0	208.9 /f	209.7 /f
MVA: /na,c (in million dollars)	127	221	203 /e	201 /f	208 /f
Growth rate /na,c (%)	-8.25	13.98	3.94 /e	2.70 /f	3.21 /f
Manufacturing share /na,c (%)	11.4	15.1	14.2 /e	14.2 /f	14.3 /f

ICELAND	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	2549	2885	3103	3355 /f	3369 /f
Growth rate /na,c (%)	1.80	4.10	3.65	2.01 /f	0.41 /f
Per capita /na,c (in dollars)	11691.7	12652.2	12768.3	13693.3 /f	13637.7 /f
MVA: /na,c (in million dollars)	401	404	436	462 /f	464 /f
Growth rate /na,c (%)	2.27	-5.98	4.50	1.91 /f	0.36 /f
Manufacturing share /na,c (%)	15.7	14.0	14.1	13.8 /f	13.8 /f

JORDAN	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1790	3287	4315	4461 /f	4618 /f
Growth rate /na,c (%)	-0.83	8.23	3.01	2.66 /f	3.53 /f
Per capita /na,c (in dollars)	668.6	1124.5	1227.6	1175.5 /f	1172.5 /f
MVA: /na,c (in million dollars)	176	363	479	519 /f	547 /f
Growth rate /na,c (%)	23.45	10.42	2.24	4.57 /f	5.44 /f
Manufacturing share /na,c (%)	9.8	11.1	11.1	11.6 /f	11.8 /f

KOREA, DEMOCRATIC PEOPLE'S REPUBLIC	1975	1980	1985	1987	1988
NMP: /na,c (in million dollars)	9775	12730	16295 /e	18029 /f	18960 /f
Growth rate /na,c (%)	4.65	5.34	4.90 /e	5.15 /f	5.16 /f
Per capita /na,c (in dollars)	616.6	706.2	799.4 /e	846.6 /f	871.1 /f
MVA: /na,c (in million dollars)	...	...	...	...	...
Growth rate /na,c (%)	...	...	...	...	...
Manufacturing share /na,c (%)	...	...	...	...	...

For source, footnotes and comments see "Technical notes" above.

KUWAIT	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	22827	27682	24967	25412 /f	26743 /f
Growth rate /na,c (%)	-1.73	-9.67	-11.60	4.83 /f	5.24 /f
Per capita /na,c (in dollars)	22868.5	20059.3	13786.0	12831.3 /f	12949.6 /f
MVA: /na,c (in million dollars)	1322	1616	1932 /e	2108 /f	2226 /f
Growth rate /na,c (%)	22.35	3.25	1.28 /e	5.47 /f	5.57 /f
Manufacturing share /na,c (%)	5.8	5.9	7.7 /e	8.3 /f	8.3 /f

LAO PEOPLE'S DEMOCRATIC REPUBLIC	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	422	430	510 /e	526 /f	534 /f
Growth rate /na,c (%)	0.60	10.03	4.60 /e	1.24 /f	1.60 /f
Per capita /na,c (in dollars)	123.2	116.8	124.0 /e	121.8 /f	120.9 /f
MVA: /na,c (in million dollars)	69	42	...	...	...
Growth rate /na,c (%)	3.70	10.00	...	...	...
Manufacturing share /na,c (%)	14.1	9.8	...	...	...

LESOTHO	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	271	414	449	503 /f	533 /f
Growth rate /na,c (%)	-8.16	4.21	2.39	5.96 /f	5.97 /f
Per capita /na,c (in dollars)	228.6	308.8	295.4	312.5 /f	319.3 /f
MVA: /na,c (in million dollars)	11	19	...	...	...
Growth rate /na,c (%)	-7.85	15.99	...	...	...
Manufacturing share /na,c (%)	4.0	4.6	...	...	...

LIBERIA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	834	917	797	825 /f	843 /f
Growth rate /na,c (%)	-3.87	-6.29	-0.87	1.98 /f	2.05 /f
Per capita /na,c (in dollars)	527.4	489.9	363.9	365.5 /f	366.6 /f
MVA: /na,c (in million dollars)	68	77	80 /e	84 /f	86 /f
Growth rate /na,c (%)	-11.15	-21.21	-0.98 /e	3.49 /f	4.00 /f
Manufacturing share /na,c (%)	8.2	8.4	7.5 /e	7.7 /f	7.9 /f

LIBYAN ARAB JAMAHIRIYA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	23479	35592	27553 /e	29329 /f	31031 /f
Growth rate /na,c (%)	8.72	0.69	0.00 /e	4.36 /f	5.80 /f
Per capita /na,c (in dollars)	9662.1	11971.6	7643.1 /e	7850.4 /f	7896.9 /f
MVA: /na,c (in million dollars)	301	723	972 /e	1220 /f	1389 /f
Growth rate /na,c (%)	9.72	15.44	11.62 /e	12.96 /f	13.90 /f
Manufacturing share /na,c (%)	1.3	2.0	3.5 /e	4.2 /f	4.6 /f

LUXEMBOURG	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	4107	4823	4719	4975 /f	5108 /f
Growth rate /na,c (%)	-6.07	0.98	1.90	2.97 /f	2.66 /f
Per capita /na,c (in dollars)	11345.5	12701.4	12998.6	13447.1 /f	13804.8 /f
MVA: /na,c (in million dollars)	1230	1382	1763	1898 /f	1986 /f
Growth rate /na,c (%)	-18.79	-1.25	6.90	5.08 /f	4.62 /f
Manufacturing share /na,c (%)	30.0	28.9	37.4	38.1 /f	38.9 /f

For source, footnotes and comments see "Technical notes" above.

MALAWI	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	937	1155	1286	1349 /f	1394 /f
Growth rate /na,c (%)	6.53	-0.67	3.78	3.49 /f	3.37 /f
Per capita /na,c (in dollars)	181.4	194.0	182.4	182.0 /f	182.1 /f
MVA: /na,c (in million dollars)	142	155	185	207 /f	220 /f
Growth rate /na,c (%)	17.37	0.57	5.02	6.25 /f	6.31 /f
Manufacturing share /na,c (%)	15.1	13.5	14.6	15.3 /f	15.8 /f

MALAYSIA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	15740	23812	30424	31725 /f	33232 /f
Growth rate /na,c (%)	0.80	7.92	-1.02	3.50 /f	4.75 /f
Per capita /na,c (in dollars)	1279.0	1730.1	1955.6	1933.9 /f	1972.6 /f
MVA: /na,c (in million dollars)	2540	4518	5699	5564 /f	5764 /f
Growth rate /na,c (%)	2.96	11.68	-5.43	1.08 /f	3.59 /f
Manufacturing share /na,c (%)	16.1	19.0	18.4	17.5 /f	17.3 /f

MALDIVES	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	25	47	72 /e	81 /f	86 /f
Growth rate /na,c (%)	12.79	18.64	3.24 /e	0.02 /f	6.59 /f
Per capita /na,c (in dollars)	185.7	303.9	395.5 /e	425.1 /f	448.2 /f
MVA: /na,c (in million dollars)	1	2	...	...	...
Growth rate /na,c (%)	22.48	19.19	...	...	...
Manufacturing share /na,c (%)	2.8	4.0	...	...	...

MALI	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1123	1422	1432	1541 /f	1582 /f
Growth rate /na,c (%)	4.83	4.04	1.10	3.54 /f	2.68 /f
Per capita /na,c (in dollars)	178.5	202.5	177.2	180.5 /f	180.5 /f
MVA: /na,c (in million dollars)	90	109	97 /e	102 /f	103 /f
Growth rate /na,c (%)	1.37	1.50	-0.67 /e	1.87 /f	0.97 /f
Manufacturing share /na,c (%)	8.0	7.7	6.8 /e	6.6 /f	6.5 /f

MARTINIQUE	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1224	1444	1545 /e	1621 /f	1653 /f
Growth rate /na,c (%)	12.12	2.79	4.97 /e	2.24 /f	2.01 /f
Per capita /na,c (in dollars)	3719.8	4430.1	4709.1 /e	4926.1 /f	5025.2 /f
MVA: /na,c (in million dollars)	...	...	...	...	...
Growth rate /na,c (%)	...	...	...	...	...
Manufacturing share /na,c (%)	...	...	...	...	...

MAURITANIA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	761	829	898	932 /f	941 /f
Growth rate /na,c (%)	10.14	0.70	3.10	-0.19 /f	0.97 /f
Per capita /na,c (in dollars)	535.7	508.4	475.5	464.1 /f	454.5 /f
MVA: /na,c (in million dollars)	31	43	...	...	...
Growth rate /na,c (%)	2.74	-1.39	...	...	...
Manufacturing share /na,c (%)	4.1	5.2	...	...	...

For source, footnotes and comments see "Technical notes" above.

MAURITIUS	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1124	1132	1409	1473 /f	1508 /f
Growth rate /na,c (%)	1.43	-10.06	6.52	-0.86 /f	2.36 /f
Per capita /na,c (in dollars)	1295.4	1185.1	1341.6	1361.9 /f	1376.5 /f
MVA: /na,c (in million dollars)	131	147	198 /e	216 /f	226 /f
Growth rate /na,c (%)	3.51	-7.03	5.93 /e	1.02 /f	4.86 /f
Manufacturing share /na,c (%)	11.6	13.0	14.0 /e	14.7 /f	15.0 /f

MONGOLIA	1975	1980	1985	1987	1988
NMP: /na,c (in million dollars)	1090	1429	1928 /e	2042 /f	2116 /f
Growth rate /na,c (%)	6.15	3.43	2.58 /e	3.22 /f	3.62 /f
Per capita /na,c (in dollars)	764.5	869.3	1010.2 /e	1016.7 /f	1027.8 /f
MVA: /na,c (in million dollars)	222	357	...	...	...
Growth rate /na,c (%)	10.73	8.03	...	...	...
Manufacturing share /na,c (%)	20.4	25.0	...	...	...

MONTSERRAT	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	19	24	27	29 /f	30 /f
Growth rate /na,c (%)	4.40	10.00	4.67	2.78 /f	2.80 /f
Per capita /na,c (in dollars)	1583.3	2016.7	2241.7	2217.6 /f	2279.8 /f
MVA: /na,c (in million dollars)	1	1	2 /e	2 /f	2 /f
Growth rate /na,c (%)	6.31	10.73	9.93 /e	6.38 /f	6.97 /f
Manufacturing share /na,c (%)	3.6	5.2	6.0 /e	6.4 /f	6.7 /f

NAMIBIA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	2037	2661	2580	2824 /f	3006 /f
Growth rate /na,c (%)	1.03	4.75	0.60	5.54 /f	6.44 /f
Per capita /na,c (in dollars)	1723.4	1972.3	1664.8	1722.1 /f	1768.2 /f
MVA: /na,c (in million dollars)	109	129	...	...	...
Growth rate /na,c (%)	6.25	2.56	...	...	...
Manufacturing share /na,c (%)	5.4	4.8	...	...	...

NEPAL	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1626	1946	2306	2461 /f	2530 /f
Growth rate /na,c (%)	1.42	4.11	2.96	2.38 /f	2.83 /f
Per capita /na,c (in dollars)	125.1	132.7	139.9	140.3 /f	141.0 /f
MVA: /na,c (in million dollars)	49	78	112 /e	130 /f	140 /f
Growth rate /na,c (%)	-2.16	9.46	7.72 /e	7.86 /f	7.76 /f
Manufacturing share /na,c (%)	3.0	4.0	4.9 /e	5.3 /f	5.5 /f

NETHERLANDS ANTILLES	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	993	1250	1156 /e	1199 /f	1217 /f
Growth rate /na,c (%)	-4.09	4.06	1.64 /e	1.70 /f	1.54 /f
Per capita /na,c (in dollars)	4152.7	4960.3	4378.0 /e	4423.6 /f	4426.6 /f
MVA: /na,c (in million dollars)	...	...	. .	...	...
Growth rate /na,c (%)	...	...	...	...	...
Manufacturing share /na,c (%)	...	...	...	...	...

For source, footnotes and comments see "Technical notes" above.

NEW CALEDONIA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1201	1183	1105 /e	1108 /f	1120 /f
Growth rate /na,c (%)	6.50	-0.38	3.37 /e	-0.38 /f	1.11 /f
Per capita /na,c (in dollars)	9026.3	8507.2	7223.5 /e	7010.: /f	6866.9 /f
MVA: /na,c (in million dollars)	60	68	68 /e	70 /f	71 /f
Growth rate /na,c (%)	-1.04	1.97	1.03 /e	1.04 /f	1.29 /f
Manufacturing share /na,c (%)	5.0	5.8	6.2 /e	6.3 /f	6.3 /f

NIGER	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1644	2538	2670 /e	2854 /f	2939 /f
Growth rate /na,c (%)	-2.50	12.37	7.85 /e	3.57 /f	3.00 /f
Per capita /na,c (in dollars)	352.3	477.9	436.6 /e	438.0 /f	437.1 /f
MVA: /na,c (in million dollars)	78	94	90 /e	...	...
Growth rate /na,c (%)	7.48	4.68	1.49 /e	...	...
Manufacturing share /na,c (%)	4.7	3.7	3.4 /e	...	...

OMAN	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	4872	6981	11265	12419 /f	13316 /f
Growth rate /na,c (%)	24.42	6.04	6.00	4.50 /f	7.22 /f
Per capita /na,c (in dollars)	6360.8	6078.5	9070.1	5970.9 /f	6281.2 /f
MVA: /na,c (in million dollars)	12	45	...	...	...
Growth rate /na,c (%)	27.38	46.69	...	...	...
Manufacturing share /na,c (%)	0.2	0.8	...	...	...

PAPUA NEW GUINEA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	2586	2549	2838	3061 /f	3105 /f
Growth rate /na,c (%)	-1.63	-2.29	4.30	2.72 /f	1.42 /f
Per capita /na,c (in dollars)	959.1	826.1	808.4	828.9 /f	820.2 /f
MVA: /na,c (in million dollars)	161	197	234 /e	271 /f	284 /f
Growth rate /na,c (%)	5.43	-3.25	8.76 /e	6.33 /f	4.87 /f
Manufacturing share /na,c (%)	6.2	7.7	8.2 /e	8.8 /f	9.1 /f

PARAGUAY	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	2711	4448	4977	5077 /f	5216 /f
Growth rate /na,c (%)	5.32	11.44	3.97	1.00 /f	2.72 /f
Per capita /na,c (in dollars)	1009.1	1404.1	1351.8	1304.9 /f	1306.8 /f
MVA: /na,c (in million dollars)	426	733	759 /e	761 /f	762 /f
Growth rate /na,c (%)	-1.86	13.30	2.96 /e	-0.62 /f	1.50 /f
Manufacturing share /na,c (%)	15.7	16.5	15.2 /e	14.8 /f	14.6 /f

PUERTO RICO	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	11076	14480	16820	16314 /f	16660 /f
Growth rate /na,c (%)	-2.43	1.69	3.00	2.20 /f	2.12 /f
Per capita /na,c (in dollars)	3700.7	4526.4	4526.1	4586.6 /f	4626.1 /f
MVA: /na,c (in million dollars)	3377	5322	6869 /e	7386 /f	7782 /f
Growth rate /na,c (%)	-9.29	7.22	6.82 /e	5.61 /f	5.23 /f
Manufacturing share /na,c (%)	30.5	36.8	42.6 /e	45.3 /f	46.7 /f

For source, footnotes and comments see "Technical notes" above.

QATAR	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	8688	7829	7670 /e	8083 /f	8349 /f
Growth rate /na,c (%)	-16.49	2.87	3.03 /e	3.18 /f	3.17 /f
Per capita /na,c (in dollars)	38528.6	34795.0	24347.8 /e	23468.6 /f	23192.8 /f
MVA: /na,c (in million dollars)	176	258	...	...	...
Growth rate /na,c (%)	7.24	10.92	...	...	...
Manufacturing share /na,c (%)	2.7	3.3	...	...	...

REUNION	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1445	1988	2525 /e	2809 /f	...
Growth rate /na,c (%)	1.82	4.20	5.79 /e	5.49 /f	...
Per capita /na,c (in dollars)	2988.5	3918.0	4765.0 /e	5135.4 /f	...
MVA: /na,c (in million dollars)	142	190	231 /e	249 /f	...
Growth rate /na,c (%)	14.29	0.86	4.87 /e	3.66 /f	...
Manufacturing share /na,c (%)	9.8	9.5	9.1 /e	8.9 /f	...

ROMANIA	1975	1980	1985	1987	1988
NMP: /na,c (in million dollars)	23883	33866	40585	46116 /f	48101 /f
Growth rate /na,c (%)	10.32	2.98	5.90	5.95 /f	4.31 /f
Per capita /na,c (in dollars)	1129.4	1529.5	1762.4	1976.1 /f	2047.1 /f
MVA: /na,c (in million dollars)	11141	16939	21486	25133 /f	26856 /f
Growth rate /na,c (%)	11.48	6.24	6.13	7.61 /f	6.05 /f
Manufacturing share /na,c (%)	46.4	49.9	53.0	54.5 /f	55.4 /f

RWANDA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	788	1163	1357 /e	1434 /f	1476 /f
Growth rate /na,c (%)	9.55	7.92	3.13 /e	2.82 /f	2.88 /f
Per capita /na,c (in dollars)	180.8	226.1	223.5 /e	221.4 /f	219.9 /f
MVA: /na,c (in million dollars)	134	178	...	...	...
Growth rate /na,c (%)	5.83	5.98	...	...	...
Manufacturing share /na,c (%)	17.0	15.3	...	...	...

SAO TOME AND PRINCIPE	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	40	46	50 /e	51 /f	51 /f
Growth rate /na,c (%)	-9.46	2.43	0.81 /e	1.16 /f	-0.01 /f
Per capita /na,c (in dollars)	502.5	544.7	512.4 /e	491.3 /f	474.9 /f
MVA: /na,c (in million dollars)	2	2	2 /e	3 /f	3 /f
Growth rate /na,c (%)	-12.68	2.86	3.57 /e	2.16 /f	1.10 /f
Manufacturing share /na,c (%)	5.4	4.8	4.9 /e	5.0 /f	5.1 /f

SAUDI ARABIA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	74512	115862	108094	117680 /f	124381 /f
Growth rate /na,c (%)	0.26	10.11	-4.77	4.86 /f	5.78 /f
Per capita /na,c (in dollars)	10276.1	12373.3	9451.9	9496.9 /f	9882.3 /f
MVA: /na,c (in million dollars)	2633	5800	8648 /e	9825 /f	10869 /f
Growth rate /na,c (%)	-2.93	8.80	6.36 /e	7.22 /f	7.39 /f
Manufacturing share /na,c (%)	4.9	5.0	7.9 /e	8.4 /f	8.6 /f

For source, footnotes and comments see "Technical notes" above.

SEYCHELLES	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	102	147	138 /e	149 /f	154 /f
Growth rate /na,c (%)	0.79	-2.61	3.12 /e	3.54 /f	3.55 /f
Per capita /na,c (in dollars)	1766.6	2267.7	1830.4 /e	1820.5 /f	1885.4 /f
MVA: /na,c (in million dollars)	4	11	...	...	...
Growth rate /na,c (%)	18.67	27.33	..	...	...
Manufacturing share /na,c (%)	4.3	7.4	...	...	...

SIERRA LEONE	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1029	1231	1223 /e	1300 /f	1343 /f
Growth rate /na,c (%)	-3.03	6.20	1.70 /e	3.26 /f	3.32 /f
Per capita /na,c (in dollars)	338.0	373.4	338.5 /e	350.5 /f	357.3 /f
MVA: /na,c (in million dollars)	83	89	81 /e	86 /f	88 /f
Growth rate /na,c (%)	3.43	7.44	1.41 /e	2.81 /f	2.85 /f
Manufacturing share /na,c (%)	8.1	7.3	6.7 /e	6.6 /f	6.6 /f

SOMALIA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	1648	1586	2163	2330 /f	...
Growth rate /na,c (%)	14.70	-2.25	4.00	3.81 /f	...
Per capita /na,c (in dollars)	475.9	394.6	464.8	466.0 /f	...
MVA: /na,c (in million dollars)	61	91	...	...	...
Growth rate /na,c (%)	-6.25	2.14	...	...	...
Manufacturing share /na,c (%)	3.9	5.7	...	...	...

SUDAN	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	7358	8246	7875	8298 /f	8405 /f
Growth rate /na,c (%)	4.35	0.21	-7.00	3.58 /f	1.29 /f
Per capita /na,c (in dollars)	469.6	441.4	365.4	363.8 /f	358.1 /f
MVA: /na,c (in million dollars)	641	577	671 /e	759 /f	802 /f
Growth rate /na,c (%)	-1.84	12.50	1.31 /e	6.84 /f	5.65 /f
Manufacturing share /na,c (%)	8.7	7.0	8.5 /e	9.2 /f	9.5 /f

SURINAME	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	836	1045	992	1030 /f	1049 /f
Growth rate /na,c (%)	1.26	-3.22	-6.10	3.62 /f	1.86 /f
Per capita /na,c (in dollars)	2287.4	2943.1	2644.0	2724.1 /f	2760.6 /f
MVA: /na,c (in million dollars)	40	77	...	...	...
Growth rate /na,c (%)	0.29	-3.70	...	...	...
Manufacturing share /na,c (%)	4.8	7.3	...	...	...

SWAZILAND	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	446	598	686 /e	756 /f	780 /f
Growth rate /na,c (%)	6.90	4.98	6.74 /e	3.68 /f	3.20 /f
Per capita /na,c (in dollars)	920.7	1070.3	1068.7 /e	1083.6 /f	1086.4 /f
MVA: /na,c (in million dollars)	76	102	116 /e	130 /f	136 /f
Growth rate /na,c (%)	9.56	11.17	8.76 /e	5.32 /f	4.78 /f
Manufacturing share /na,c (%)	16.9	17.1	16.6 /e	17.2 /f	17.4 /f

For source, footnotes and comments see "Technical notes" above.

TOGO	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	986	1131	1010 /e	1104 /f	1125 /f
Growth rate /na,c (%)	-0.62	-4.53	3.01 /e	3.91 /f	1.90 /f
Per capita /na,c (in dollars)	429.0	442.7	341.2 /e	351.7 /f	346.3 /f
MVA: /na,c (in million dollars)	103	79	65 /e	65 /f	65 /f
Growth rate /na,c (%)	2.73	-3.19	-0.62 /e	0.01 /f	-0.83 /f
Manufacturing share /na,c (%)	10.7	7.0	6.4 /e	5.9 /f	5.7 /f

TONGA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	47	60	81 /e	82 /f	86 /f
Growth rate /na,c (%)	4.18	16.96	-1.68 /e	1.99 /f	4.61 /f
Per capita /na,c (in dollars)	538.6	621.6	746.1 /e	740.0 /f	766.3 /f
MVA: /na,c (in million dollars)	2	3	3 /e	3 /f	3 /f
Growth rate /na,c (%)	10.02	21.44	-1.33 /e	1.78 /f	4.02 /f
Manufacturing share /na,c (%)	4.4	5.3	3.6 /e	3.6 /f	3.6 /f

TRINIDAD AND TOBAGO	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	4644	6511	5664	5179 /f	5539 /f
Growth rate /na,c (%)	2.49	2.92	-5.61	-0.50 /f	6.95 /f
Per capita /na,c (in dollars)	4503.2	5945.7	4779.7	4231.3 /f	4452.6 /f
MVA: /na,c (in million dollars)	431	596	...	...	...
Growth rate /na,c (%)	-14.61	12.51	...	...	...
Manufacturing share /na,c (%)	9.5	9.1	...	...	...

UGANDA	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	14969	12442	14819	16754 /f	17606 /f
Growth rate /na,c (%)	-2.02	-3.40	-6.50	5.80 /f	5.09 /f
Per capita /na,c (in dollars)	1340.0	949.4	957.5	1008.0 /f	1026.6 /f
MVA: /na,c (in million dollars)	995	515	515 /e	587 /f	615 /f
Growth rate /na,c (%)	-13.85	6.10	-13.99 /e	5.85 /f	4.71 /f
Manufacturing share /na,c (%)	6.6	4.1	3.5 /e	3.5 /f	3.5 /f

UNITED ARAB EMIRATES	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	14224	29629	24630	26028 /f	27509 /f
Growth rate /na,c (%)	15.80	26.42	-4.50	2.00 /f	5.69 /f
Per capita /na,c (in dollars)	28165.5	30233.2	18660.4	17950.2 /f	18217.7 /f
MVA: /na,c (in million dollars)	127	1131	...	...	...
Growth rate /na,c (%)	50.80	64.87	...	...	...
Manufacturing share /na,c (%)	0.9	3.8	...	...	...

VANUATU	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	37	40	55 /e	59 /f	61 /f
Growth rate /na,c (%)	-4.89	-11.50	3.80 /e	3.84 /f	3.84 /f
Per capita /na,c (in dollars)	381.2	341.9	386.2 /e	402.0 /f	403.1 /f
MVA: /na,c (in million dollars)	2	2	2 /e	2 /f	2 /f
Growth rate /na,c (%)	-0.99	1.98	1.30 /e	1.03 /f	1.43 /f
Manufacturing share /na,c (%)	4.1	4.2	3.1 /e	3.0 /f	2.9 /f

For source, footnotes and comments see "Technical notes" above.

VIET NAM	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	4636	5380	6827	7471 /f	7686 /f
Growth rate /na,c (%)	4.58	5.30	3.60	3.41 /f	2.61 /f
Per capita /na,c (in dollars)	95.5	99.3	116.0	120.5 /f	121.3 /f
MVA: /na,c (in million dollars)	...	...	...	...	...
Growth rate /na,c (%)	...	...	...	...	...
Manufacturing share /na,c (%)	...	...	...	...	...

YEMEN (ARAB REPUBLIC)	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	2084	2768	3312	3824 /f	...
Growth rate /na,c (%)	11.03	3.75	3.00	5.16 /f	...
Per capita /na,c (in dollars)	394.5	462.8	483.6	531.9 /f	...
MVA: /na,c (in million dollars)	92	160	...	...	...
Growth rate /na,c (%)	10.30	7.69	...	...	...
Manufacturing share /na,c (%)	4.4	5.8	...	...	...

YEMEN, DEMOCRATIC	1975	1980	1985	1987	1988
GDP: /na,c (in million dollars)	421	868	742 /e	765 /f	773 /f
Growth rate /na,c (%)	-7.00	-7.31	2.93 /e	1.76 /f	1.05 /f
Per capita /na,c (in dollars)	264.5	359.2	347.0 /e	314.5 /f	308.6 /f
MVA: /na,c (in million dollars)	64	80	110 /e	121 /f	128 /f
Growth rate /na,c (%)	10.33	2.06	4.64 /e	5.29 /f	5.40 /f
Manufacturing share /na,c (%)	15.2	12.0	14.8 /e	15.8 /f	16.5 /f

For source, footnotes and comments see "Technical notes" above.