OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

(xxii) 147p. tables

GLOBAL FORUM ON INDUSTRY

Perspectives for 2000 and Beyond

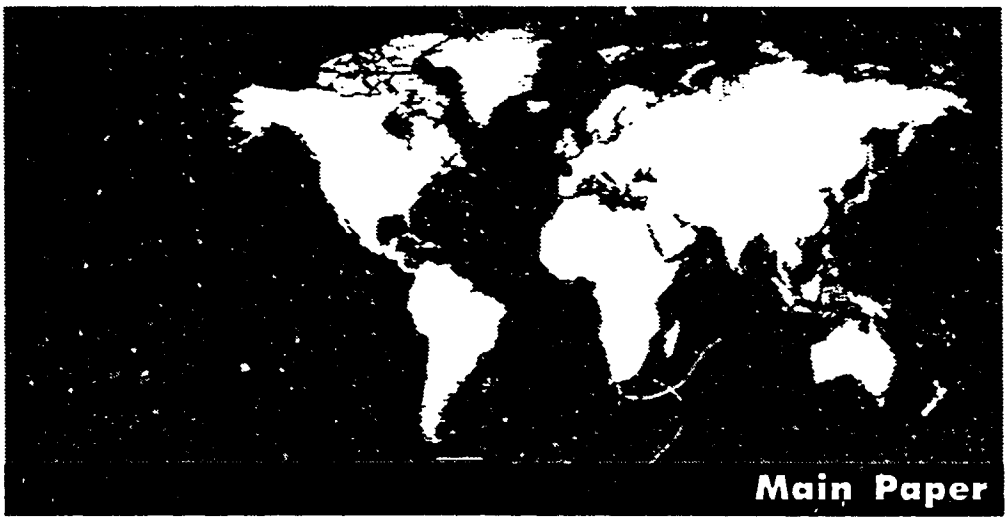
NEW DELHI, INDIA, 16–18 OCTOBER 1995

Distr.
LIMITED

ID/WG.542/1(SPEC.)
29 September 1995

ORIGINAL: ENGLISH

21354



Perspectives on industrialization: Global industrial partnerships, interdependence and competitiveness

Prepared by

the UNIDO Secretariat

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

V.95-57749

This document was prepared by the UNIDO Industrial Development Review Unit in cooperation with Professor Tony Hawkins, University of Zimbabwe.

CONTENTS

LIST OF ABBREVIATIONS

ACP	African, Caribbean and Pacific States
CMEA	Council for Mutual Economic Assistance
DFD	Design for disassembly
EDI	Electronic data interchange
EU	European Union
FDI	Foreign Direct Investment
FMS	Flexible manufacturing systems
GFCF	Gross fixed capital formation
GSP	Generalized System of Preferences
HDI	Human Development Index
IPRs	Intellectual property rights
IRS	Industry-related services
ISI	Import substitution industrialization
ISO	International Standards Organization
JIT	Just-in-time
LDCs	Least developed countries
MFA	Multi-fibre Arrangement
MOT	Management of technology
NAFTA	North American Free Trade Agreement
NEC	Non-equity cooperation
NIEs	Newly industrializing economies
NTBs	Non-tariff barriers
OPT	Outward processing trade
PDM	Product data management
R&D	Research and development
SMEs	Small and medium enterprises
TNC	Transnational corporation
TQM	Total quality management
TRIMs	Trade-related investment measures
TRIPs	Trade-related intellectual property rights

EXECUTIVE SUMMARY

INDUSTRIALIZATION AS THE MAINSPRING OF ECONOMIC GROWTH

1. Industrialization is the driving force of the development process. Industry and, more specifically, manufacturing is synonymous with development. Rich countries are more industrialized than poor ones, and all major economies have followed the industrialization route to prosperity. Living standards are highest and social development greatest in highly industrialized States, while at the other end of the spectrum, the least developed countries (LDCs) are those where manufacturing value-added (MVA) accounts for less than 10 per cent of GDP.

2. Industrialization is more than the engine of economic growth; it is also the catalyst for the technological, financial and socio-economic transformation of the developed-market economies of North America, the European Union and Japan. Economic growth, driven by industrialization, has multiplier effects across and within economies (see Chapter 8), and contributes not just to improved living standards but also to cultural change and reduced rates of population growth. Technological development is most rapid in manufacturing and related service activities; countries that neglect their industrial sectors run the risk not just of being left behind technologically, but of being vulnerable to the vagaries of commodity price fluctuations and, for much of the past 25 years, deteriorating terms of trade (see Chapter 1).

3. Over the past 50 years, industrialization has transformed the economies of the OECD countries socially as well as economically, and in the past two decades the same process has reached an advanced stage in some newly industrializing economies, especially, but not only, in East and South-East Asia. While the developing countries' share of global MVA has more than doubled since 1960, rising from 8.6 per cent to an estimated 21.3 per cent in 1995, progress has been uneven. The main gains have been confined to a relatively small handful of mainly Asian economies, including China (see Chapter 2).

4. At the same time, industry's catalytic role in the development process is changing in response to the new global pattern of rapid and accelerating technological change, sweeping trade liberalization, far-reaching deregulation of markets - including the privatization and commercialization of State-owned enterprises - and the globalization of international business.

5. Consequently, the pattern and nature of industrialization have changed radically over the past two decades, with far-reaching implications for national industrial policy and for corporate strategies at the enterprise level. In the Uruguay Round era, economic decision-making, at national and firm level, is increasingly influenced by crossborder considerations. Rapidly growing interdependence means that decision-makers cannot ignore trends and developments beyond their national borders. The concept of the domestic market, which was at the heart of industrialization strategies in the 1960s and 1970s, has lost much of its meaning in the single market of the European Union and in the North American Free Trade Agreement (NAFTA). National markets are being regionalized, and the national firms are increasingly being challenged by foreign rather than domestic competitors as the progressive implementation of the Uruguay Round Agreements means that trade barriers are lowered.

6. Competition intensifies as industries and firms are stripped of their protective barriers, highlighting the need for enhanced competitiveness at both enterprise and national levels. Business is responding to this new order by globalizing many of its activities, seeking locations where costs are lowest, where sourcing is most efficient, where labour is most productive, where skills are readily available and where market access is guaranteed.

7. The new challenges are all the more difficult to meet because the pace of change has accelerated - and in the case of technological progress continues to quicken (see Chapter 4) - while product, strategy and policy life-cycles shorten. At the same time the nature of competitive advantage has changed. In the twenty-first century, countries will be forced to reduce this reliance on factor-driven comparative advantages - such as a rich natural resource base, plentiful low-cost labour, abundant cheap energy - as the launch pad for industrial development. National entrepreneurial capability, and the development of innovative skills, technology and market access, often linked to external linkages through foreign direct investment (FDI) and non-equity forms of crossborder business cooperation, have become key sources of competitive advantage for developing countries and a number of transition economies.

A WIN-WIN FORMULA

8. The implications of the changed industrial environment for developing countries are obvious; those States that fail to lock into the global integration process risk being left behind socially as well as economically. The implications for the developed market economies are no less stark. No nation can isolate itself behind tariff walls or other barriers. Even if it were feasible, prosperous nations cannot afford to disregard the plight of the developing countries. The increased proportion of the global aid budget earmarked for emergencies in the developing world is a reminder that where problems are left to fester and spread, one country's crisis soon takes on a regional, if not an international, dimension. Funds invested now in industrial projects that generate jobs and alleviate poverty help prevent subsequent economic, social and humanitarian crises.

9. Unemployment, political instability, civil unrest, drought and disaster in Africa, Asia, Latin America, the Middle East or the countries in transition quickly translate into social problems in Europe or North America. National boundaries do not block the crossborder migration of the unemployed, the dispossessed, the refugees and the sick. Drug trafficking and money laundering is as much - if not more - a crisis for the industrialized countries as for the developing world.

10. Fortunately, globalization is not a zero-sum game. Enhanced global competition and the growing cross-border mobility of capital, technology and skills heighten interdependence by forcing firms to consider new and different ways of carrying out value-adding activities in different countries where labour, transport, production or marketing costs are lower. Because production - and service - costs are frequently considerably lower in developing countries and the economies in transition than in the industrialized world, there are often substantial cost savings to be made from outsourcing activities.

11. For their part, the developed market economies benefit from increased market opportunities generated by rapid *per capita* income growth in developing countries and economies in transition. Growth in the developing world accounts for roughly half the increase in exports from industrialized countries to that area since 1985. Projections suggest that growth in developing countries could account for up to three-quarters of the increase in their imports from industrialized economies over the next decade.

12. Precisely how industrialized-country firms penetrate such markets - by direct export, licensing technologies and product brand names, joint ventures or FDI in wholly owned subsidiaries - will depend on a whole host of considerations, including the policy environment of the host economy, its location *vis-à-vis* the main markets, its skills and technological capability and the pattern of its resource endowment. Some of these options - such as non-equity ties - might benefit developing countries considerably more than direct imports from industrial countries. Industrial policy - in the very broadest sense of appropriate macroeconomic strategies and targeted selective interventions - has a major role to play in ensuring that developing economies exploit these opportunities to the full.

13. The most vulnerable countries will be those whose "interdependence coefficient" is low; those least integrated with the global economy in terms of exports, FDI and non-equity links; and those for whom manufacturing accounts for less than one-tenth of GDP. The challenge for the next decade is how to integrate small, technologically backward economies with no industrial base to speak of with the developing-world high flyers. A failure to do so would not just perpetuate and exacerbate the widening gap between third world haves and have nots, but expose the global economy to the negative aspects of interdependence. If this is allowed to happen, a potential win-win situation could all too easily degenerate into a lose-lose scenario.

THE NEW PATTERN OF GLOBAL INDUSTRY

14. While the new global business order has its origins in the reduced role of the State - embodied in trade liberalization, deregulation and privatization - many other influences are also at work. These include:

- The accelerating pace of technological progress - possibly the most important single determinant of competitive advantage (see Chapter 4).

- The new emphasis on core competencies in large businesses giving rise to the "de-layering" and "rightsizing" of manufacturing industry, and the outsourcing and externalizing of many activities that were previously conducted in-house, with adverse repercussions on the level of direct employment in industry. General Electric of the United States of America reports that it has trebled output since 1980, while halving its workforce (see Chapters 1 and 8).

- The quickening pace of globalization reflected in the explosive growth of FDI over the past decade, the emergence of competitive national enterprises and industrial groups in newly-industrializing developing countries, and the widening

range of non-equity links, especially crossborder coalitions and strategic alliances, as well as joint ventures, licensing and technology agreements (see Chapter 3).

- The shifting centre of gravity of global industry as the East Asian cluster - comprising Japan, China and successive waves of newly industrializing Asian countries - builds market share at the expense of the developed market economies. The share of global MVA of the latter declined from 86 per cent in 1970 to an estimated 76 per cent in 1995 and is expected to fall further to 67.6 per cent by 2005. The share of the countries in transition has fallen from more than 4 per cent in 1970 to 2.3 per cent in 1995, while developing countries have raised their share from 10.3 per cent to 21.3 per cent in the past 25 years. More than 80 per cent of these gains were achieved by the South-East and East Asian economies, including China, whose market share rose more than fivefold from 2.1 per cent in 1970 to 11 per cent in 1995 (see Chapter 2).

- With the exception of East and South-East Asia, the service sector has grown faster than any other sector of the economy. Manufacturing industry's share of global GDP fell from 28.8 per cent in 1960 to 22.2 per cent thirty years later. The major declines occurred in North America (a fall of 10 percentage points to 18.5 per cent), Western Europe (down 5.7 points to 23.7 per cent) and Japan, where manufacturing's share in GDP fell 5.5 points to 29.1 per cent (see Chapter 2). This trend is one result of the outsourcing of industry-related services as manufacturing companies restructure their operations to cut costs, enhance efficiency and boost competitiveness (see Chapter 6).

- The rapid growth of financial markets in the developing countries and the countries in transition associated with the liberalization of capital flows, giving rise to substantially enhanced crossborder flows of portfolio investment channelled through emerging stock markets (see Chapter 3).

- The political and economic revolution and subsequent far-reaching industrial restructuring in the countries in transition in eastern and central Europe.

- The resurgence of regionalism, most apparent in the deepening and widening of the European Union (EU), but also in the development of NAFTA, the creation of the Asia Pacific Economic Cooperation (APEC) forum and the period of intense activity since 1990 in developing new regional economic integration agreements (see Chapter 5).

- The disillusionment with the strategy of import-substitution-industrialization (ISI) and subsequent widespread adoption of market-oriented policies emphasizing trade liberalization, deregulation and privatization, often under pressure from donor countries and the multilateral institutions (see Chapter 6).

- The enhanced emphasis on export-driven industrial growth which, in turn, underscores the need for development of technological capability and upgrading and improved competitiveness in manufacturing industry (see Chapters 5 and 6).

- The increased urgency of measures to achieve environmentally sustainable economic growth (see Chapter 7).

- The growing role of small and medium-sized enterprises (SMEs) in industrial development, in exporting and, specifically, job creation (see Chapters 6 and 8).

- The role of rural industry both in creating jobs and contributing towards greater gender equality and social integration (see Chapter 8).

THE CHANGING NATURE OF INDUSTRIAL DEVELOPMENT

15. Taken together, these forces and developments mean that over the next two decades the pattern and nature of industrial development will be very different from that of the past, although industrialization will continue to be the driving force of the development process. Industry's dynamic role in generating economic growth, employment and social progress cannot be separated from that of the service sector, with which it is closely integrated. A feature of recent industrialization is the externalizing and outsourcing of activities by manufacturing industry proper to subcontractors supplying industry-related services. Through these linkages with services, and also with agriculture and construction, manufacturing has substantial multiplier effects across the entire economy (see Chapter 1).

16. Global industrial growth has slowed markedly over the past 30 years, falling from an annual 6.2 per cent in the 1960s to 3.7 per cent in the 1970s, 2.8 per cent in the 1980s and 1.4 per cent during the 1990-94 period. The slowdown has been most marked in the industrialized economies - where growth has slowed from 5.8 per cent a year in the 1960s to 0.9 per cent per annum in the early 1990s - and in Eastern Europe, where output fell by 13.6 per cent per annum in the first four years of the 1990s having registered growth of more than 8 per cent annually in the 1960s and 1970s (see Chapter 2).

17. Developing countries fared better; MVA growth held above 6.5 per cent a year throughout the period, except for the 1980s, when it averaged 4.3 per cent annually. However, growth rates varied widely across regions, with Asia (including China and the Indian subcontinent) performing far better than Latin America and Tropical Africa. In this latter region, MVA growth has not kept pace with population expansion since the 1960s, while in Latin America and the Caribbean, strong growth of 6.3-7.1 per cent a year in the 1960s and 1970s - the heyday of import substitution - was followed by falling output in the 1980s and modest 3 per cent annual growth in the 1990-1994 period. Growth in South-East and East Asia has also slowed - from more than 11 per cent in the 1960-80 period to an average of 7.7 per cent in the past 15 years.

18. The declining share of manufacturing in GDP has been confined mainly to the developed-market economies of North America, western Europe and Japan. In North America, the contribution of manufacturing to GDP fell from 25.6 per cent in 1970 to 17.8 per cent in 1990, while in western Europe and Japan, industry's share declined from 30.4 per cent to 23.8 per cent, and from 36 per cent to 29 per cent respectively. However, these data must be interpreted cautiously, since the outsourcing of industry-related services implicit in much of the recent restructuring of industry distorts

the 20-year comparison. Because such services are heavily dependent on output growth in manufacturing and because their reclassification as tertiary services rather than manufacturing activities is more a matter of definition than of structural change, there is a danger of so-called deindustrialization being exaggerated. This danger is enhanced by the fact that these declines in industry's share in GDP, despite an absolute increase in output, reflect the impact of structural change both within manufacturing itself, and between industry and other sectors, which have resulted in the growth rates of some other sectors overtaking the rate of manufacturing growth, even though the latter has remained positive in almost all cases.

19. One region - sub-Saharan Africa - has been left behind: its tiny share of global MVA fell from 0.4 per cent in 1970 to 0.3 per cent in 1994, and there is some evidence to suggest that structural adjustment programmes, few of which include explicit industrialization strategies, have contributed to the lacklustre performance of manufacturing in the region since the mid-1970s. In ten out of 18 countries for which data are available, the share of manufacturing in GDP fell between 1970 and 1993 (see Chapter 6).

20. The challenges now facing industrializing and restructuring countries are heightened by four trends:

- The slower growth rate of "early" industry, in which developing countries have a comparative advantage, relative to the expansion of high technology, skills- and capital-intensive manufacturing;

- The rapid, accelerating pace of technological progress, which is affecting all industries, including those traditionally classified as technologically mature (labour-intensive) sectors. This has raised the spectre of technological unemployment, although there is little evidence of this as yet (see Chapter 4);

- The increasing importance of labour quality in the attraction of FDI, joint ventures and non-equity links with international companies. There is mounting evidence that the availability of higher quality personnel is a more significant determinant of industrial potential than many other physical attributes (see Chapters 3 and 6); and

- The growing realization that industrial development is not be achieved only from the outside by foreign TNCs, or foreign aid/investment. All the evidence points to a major and increasing role for indigenous enterprise, often at the small- and medium-enterprise level, emphasizing clusters and industrial districts, through technology transfer, technological and skills upgrading, and the development of competitive and sustainable indigenous industrial capacity.

INTERDEPENDENCE AND INTEGRATION

21. Foreign trade and increased integration with the world economy through FDI, joint ventures and non-equity cooperation are the main forces driving industrialization in the 1990s. Those countries that have globalized the most by opening up their

countries to foreign trade, investment and non-equity external links have also achieved the fastest industrial and GDP growth. Some of the stagnation experienced by countries and regions that have not yet participated significantly in the globalization process, such as sub-Saharan Africa and some less-developed countries, is explained by their failure - or inability - to integrate more fully with the world economy by increasing and diversifying their exports, and mobilizing investments including portfolio and FDI inflows.

22. Globalization reflects growing crossborder interdependence and cooperation driven by trade and capital flows. Increasingly, TNCs are adopting global and regional strategies and their offshore investment and location decisions are driven by three crucial considerations: cost reductions, efficiency gains and market access. This has meant that the bulk of FDI and non-equity co-operation (NEC) is attracted by those countries that are part of a strong regional cluster (such as the EU, NAFTA or South and South-East Asia), or have large fast-growing domestic markets and/or a resource endowment and policy framework that makes them profitable locations on cost and efficiency grounds (see Chapter 3).

23. Developing countries seeking to build competitive advantage in the face of intensified global competition, the liberalization of world trade and the widening technological and skills gap (between the least-developed economies and the rest of the world in particular) must:

- Upgrade technologically, necessitating heavy investment in both hardware and software, with a particular emphasis on skills development; and/or

- Industrialize by exploiting their low-cost, locational advantages, such as a rich raw material base, cheap energy, or static if not declining real wages (see Chapter 4). Countries with a rich resource base in agriculture and minerals have the opportunity to follow a resource-based industrialization strategy, developing the capacity to process and beneficiate raw materials, thereby adding value and enhancing their bargaining power in world markets.

24. Technological upgrading is the route to dynamic comparative advantage, involving the development of new skills and capacity as undertaken so successfully by the newly industrializing Asian economies. It implies:

- The more effective transfer of technology from industrialized to developing countries; and

- Institution- and capacity-building to create the skills base necessary for technology absorption, diffusion and adaptation.

25. Contrary to many optimistic predictions, industrial automation has not yet lowered entry barriers to, or scale economies in, many industries. In mechanical engineering, for instance, automation has led to greater concentration and oligopoly rather than enhancing the activities of SMEs. However, while the retention of conventional technologies may be more appropriate for developing countries with a weak skills base and large-scale unemployment, such a strategy could well act as a brake on technological

advance. Developing-country competitiveness depends crucially on technological upgrading, with the more advanced developing countries moving upmarket into higher-tech activities (see Chapter 4).

26. For developing countries, the greater scope for crossborder vertical integration is an important, positive aspect of globalization. Globalization helps to promote subcontracting and offshore manufacturing activities. However, for this to happen, developing countries need to open their economies to enterprise-level linkages of different kinds, including links with TNCs and medium-sized firms in the developed market economies. The latter are more likely to prefer a subcontracting or licensing relationship than the TNCs, who usually prefer FDI with majority ownership of foreign affiliates.

IMPLICATIONS FOR INDUSTRY OF THE URUGUAY ROUND AGREEMENTS

27. Developing countries as a whole will benefit from tariff cuts implemented by industrialized countries and, to a lesser extent, by developing nations, while also gaining from the reduction in tariff escalation, which currently discriminates against imports of manufactures into OECD economies. At the same time, most African, Caribbean and Pacific countries are likely to face negative effects, particularly during the short term, resulting from the erosion of existing preferential arrangements, and they will need to carry out major restructuring in potential growth sectors and enterprises, to achieve greater competitiveness and export-oriented growth.

28. The abolition of the Multi-Fibre Arrangement (MFA) as part of the Uruguay Round Agreements will benefit the more efficient developing-country manufacturers of clothing and textiles, although the main impact will not be felt until 2005 because the reforms are backloaded. China and India are likely to be among the main beneficiaries, although on balance more developing countries seem likely to lose than to gain market shares, underlining the need for them to focus on improving their competitive capability.

29. The phase-out of trade-related investment measures (TRIMs) will have a significant impact on developing countries, in that Governments will no longer be able to use such policies to boost domestic value-added and insist that foreign investors give priority to exports. In general, the TRIMs agreement means that performance requirements cannot be imposed on foreign investors. With the prohibition of such provisions, host Governments will have to seek alternative ways of inducing foreign investors to expand local content and value-added, and boost exports. At the same time, however, TRIMs will maintain the pressure on developing countries to liberalize their investment regimes as part of their drive to attract new investment.

30. The trade-related aspects of intellectual property rights (TRIPs) agreement may well have a more severe impact, especially in high-technology sectors, working to the disadvantage of developing countries in two main respects: countries wishing to place and sell products covered by patents will be forced into licensing agreements involving royalty payments to patent owners; while research and development activities may be stifled since the TRIPs agreement is likely to inhibit "reverse engineering" - the process

by which industrial country products are copied and adapted for developing-country usage (see Chapter 5).

31. The reduction of Most-Favoured Nation (MFN) tariffs under the Uruguay Round will divert trade away from African, Caribbean and Pacific (ACP) suppliers to other developing countries, as well as producers in the countries in transition. Preference erosion is expected to be most severe in the EU market, where ACP exporters enjoy their greatest preferential advantages. However, as a proportion of total ACP exports to the world, the ACP preference erosion loss will be tiny, at just 0.6 per cent.

32. ACP exporters will suffer from the phasing out of the MFA agreement, with total industrial export losses assessed at $317 million or 14 per cent of their overall losses. ACP producers of clothing and textiles are forecast to lose their market share to their highly competitive Asian rivals.

33. The clothing and textile sectors in the countries in transition - most notably the former Soviet Union, Bulgaria, the Czech Republic and Slovakia - will also gain from the MFA phase-out. Industry in the Baltic States, the Czech Republic, Hungary, Poland, Romania and Slovakia, which appear to have a comparative advantage in manufacturing and semi-manufacturing, should also benefit from enhanced access to industrial country markets.

34. Although resurgent enthusiasm for regional economic integration among emerging economies is not justified by its disappointing track record, many countries now believe that they have little option but to seek closer economic ties with their neighbours. As a result, there has been a marked increase in the number of regional integration agreements, with 33 being notified to the General Agreement on Tariffs and Trade (GATT) between 1990 and 1994. Evidence suggests that such arrangements complement rather than compete with multilateral trade liberalization, while also enabling developing countries to strengthen their bargaining power (see Chapter 5).

ENVIRONMENTAL POLICIES

35. The relationship between (domestic and international) environmental policies and industrial competitiveness is a complex one. This issue has become an important concern for the industrializing countries of Latin America and the Caribbean. Firms in developing countries fear that stricter environmental standards in developed countries will result in a loss in market share and export earnings due to higher compliance and production costs.

36. There may be short-term adverse effects on certain sectors or firms in developing countries, but the impacts at the macro level are insignificant. In the medium to long term, the competitive position of efficient firms in export markets will most likely improve due to improved quality and environmental standards. Empirical evidence shows that the effects of stringent environmental norms on the competitiveness of individual firms will vary depending on a number of factors including: the type of industry and its share in export markets; firm size and location of firms; degree of openness of the economy and rate of economic growth; availability of infrastructure

facilities especially for small firms; and availability of timely information on foreign standards and environmental regulations. Competitiveness is more likely to suffer in small firms and companies operating in natural resource-intensive industries.

37. Eco-labelling has the potential in the short run to reduce the export opportunities of developing countries, assuming that it becomes a significant marketing tool in developed countries. Developing countries lack the pertinent information and infrastructure (certification and accreditation bodies) needed to qualify for many eco-labelling schemes. Their firms have limited access to cleaner technologies and may incur relatively high compliance costs in meeting the requirements for eco-labelling schemes, which are becoming even greater with the growing use of process-related criteria for awarding eco-labels. The ISO/DIS 14000 standard has the potential to overcome some of these negative impacts. However, more efforts in the areas of international labels, mutual recognition, certification, equivalency, transparency, participation and technical assistance are needed to ensure that eco-labelling requirements are not perceived to be, or do not become, barriers to trade.

38. Whereas it is difficult to quantify the impacts of international environmental agreements on competitiveness, the Montreal Protocol on Substances that Deplete the Ozone Layer attempts to reimburse incremental costs through financial assistance. The impacts of environment-related NAFTA clauses on competitiveness are still unclear. However, the existence of parallel provisions for technical and financial assistance provides a reasonable cushion for lessening adverse impacts.

39. Policy responses at the sectoral, national and international levels are necessary to mitigate and alleviate fears about the adverse consequences of stricter environmental regulations on the competitive position of industry in developing countries. Response options include: economic instruments and border tax adjustments, harmonization of environmental policies, environmental/industrial policy integration, facilitation of cleaner production technologies, and a host of measures to lessen the competitiveness impacts of eco-labelling requirements.

SOCIAL IMPLICATIONS OF INDUSTRIAL DEVELOPMENT

40. SMEs will play an increasingly important role in terms of output, exports and, especially, employment. Such a growth pattern, with its strong trickle-down and linkage effects with the rest of the economy, will have positive social implications. Industrial districts and clusters, which enable groups of small firms to exploit economies of scale and enhance collective efficiency, will strengthen and diversify the industrial base of developing economies. By dint of subcontracting and other non-equity relationships, SMEs can be expected to expand their export activities significantly (see Chapters 6 and 8).

41. Direct employment creation in industry has slowed as a consequence of economic progress, structural change, industrial restructuring and technological advance. While the restructuring and outsourcing of services previously performed in-house has meant job losses, the indirect job-creation capability of manufacturing has been much understated.

Research shows that the indirect employment effects of investment in industry are large relative to direct effects resulting from inter-industry and cross-sector linkages.

42. In the 1970s and 1980s, foreign direct investment, joint ventures and non-equity links were the main engine of employment growth, along with rapid job creation in the services sector (especially the public sector), and high levels of informal sector absorption of potential employees. Today, this pattern has changed in three main respects:

- Low-cost unskilled and semi-skilled labour is less likely to attract foreign participation than in the past. Instead, FDI and joint ventures are attracted by high-quality, skilled personnel. On the whole, investment in modern, scale-effective plants creates fewer - and higher-quality - jobs than in the 1970s and 1980s.

- Public-sector employment creation has slowed and, in many cases, turned negative as State-owned enterprises are privatized, invariably with substantial retrenchment of labour. At the same time, in the less-developed countries in particular many Governments have been forced to trim their public service workforce in an effort to curb fiscal deficits.

- The advantages of informal sector development are assessed more critically than in the past.

43. Manufacturing contribution to improved social conditions and reduced income inequality depends on a host of considerations, in particular the pattern of industrial development and the policy framework within which it takes place. Social progress is not guaranteed, the evidence cited in Chapter 1 notwithstanding. Trickle-down linkage effects were invariably weak in those countries that followed capital- and/or natural-resource-intensive growth paths. Trickle-down effects and social progress have been far greater where a country's development strategy has targeted agriculture, labour-intensive industry or services.

44. For a number of reasons, industrialization is unlikely to generate direct employment on the same scale as in the 1960s and 1970s. In the late 1990s and beyond, employment creation and poverty alleviation will have to be tackled in a very different global business environment - one in which the scope of national industrial policy may become increasingly circumscribed (see Chapters 1, 5 and 6).

45. With integrated international production, manufacturers establish individual value-adding activities in different locations, leading to greater labour market interdependence and a new international division of labour. Greater crossborder interdependence between TNC affiliates and enterprise-level non-equity links means that competitive business activities can be located in different countries and, in some instances, outsourced to subcontractors. The resulting relocation and interdependence of jobs highlights the much enhanced role of education and training in attracting new investments and developing technological skills and capability. Labour quality is increasingly influential in location decisions of foreign investors and partners, and countries able to provide the high-level skills required are much more likely to attract

foreign direct investment and participation in high value-adding activities than countries that are still reliant on low-cost, low-productivity personnel.

46. Efforts to devise a socially optimal industrial growth path for developing countries are constrained by the need to ensure increased competitiveness. Industries in the developing world can no longer rely on "lower order" competitive advantage - in the form of natural resources and low-cost labour. Increasingly, competitive advantage is based on technological capability, the continuous upgrading of production techniques, quality and design, human skills, flexible production systems and aggressive marketing.

47. In narrowing the policy options available to national Governments, globalization and the liberalization of trade and investments are channelling developing countries towards a different industrialization path from that taken by OECD countries. For the less-developed countries in particular, a dual pattern of integrated industrial growth may be needed, comprising externally oriented industrial development driven by export-dominated activities integrated with a vibrant medium, small-scale and micro-enterprise sector, focusing on subcontracting and other supplier linkages with the external sector while also satisfying domestic demands for goods and services including in less-developed and rural regions. Because small firms are typically more labour-intensive, the SME sector including micro enterprises, can play a vital role in poverty alleviation by generating jobs and income for the most vulnerable communities, as well as providing an essential element in the value-added chain of manufacturing activities.

48. Until relatively recently, reliance on small-scale and micro enterprises was seen as an indicator of underdevelopment, and the fostering of such enterprises was justified on social rather than economic grounds. Micro enterprises, in particular, were to be encouraged so as to achieve job generation, equitable income distribution and poverty alleviation rather than for any major contribution to economic efficiency and competitiveness.

49. The conjuncture of disillusionment, especially in Africa but also in Latin America and Asia, with industrialization driven by capital-intensive and large-scale enterprise, and growing anxiety about the failure of such investments to generate enough jobs to keep pace with labour force growth has contributed to the revival of emphasis on the key role of SMEs. Three vehicles for SME participation in the globalization process have attracted growing attention:

- Subcontracting relations with large firms;

- The development of industrial districts and firm clusters, especially in Italy (see Chapter 6); and

- Township and Village Enterprises (TVEs) in China (see Chapter 8).

50. As far as globalization is concerned, participation in exports has been a striking feature of recent SME development. In Taiwan Province of China, the share of SMEs in total exports is 56 per cent, in China itself more than 50 per cent and for East Asia

as a whole about 40 per cent - more than double the estimated 20 per cent for SMEs in OECD countries.

51. SME contributions to exports take various forms, ranging from subcontracting to direct exports, sometimes via associated firms or export market intermediaries. Korean data show a marked increase in direct exports, not just of traditional products like woven textiles, but also more technologically advanced items like auto parts and metal-cutting equipment.

52. Research shows that SME support programmes can make a substantial contribution to job creation. In a study of five sub-Saharan economies, it was found that 43 per cent of the increase in employment during the 1980-91 period occurred in small enterprises employing less than 50 people, while in Colombia, India, Indonesia, Kenya, the Philippines, United Republic of Tanzania and Zambia, SMEs employing up to 50 workers absorb more than half the industrial workforce.

53. In this context rural industrialization is an attractive policy option for a number of reasons:

- Small rural firms use labour-intensive techniques and employ relatively unskilled people;
- They maximize utilization of local raw materials as well as unskilled workers;
- They are often a vehicle for developing entrepreneurship and upgrading entrepreneurial skills;
- They provide the basic needs requirements of the rural population; and
- They contribute to improved gender equality by employing a high proportion of women.

INDUSTRIAL POLICY

54. The impact of national economic policies is becoming diluted as economies are liberalized and decontrolled, and nation States become more interdependent. At the same time, economic policy is converging on the middle ground as policy-makers eschew extreme interventionist or free market solutions.

55. The debate on industrialization strategies has shifted decisively over the past decade; the disagreements of the 1970s over inward-looking versus outward-oriented industrial policy have been replaced by a dialogue on the most effective strategies for building competitive advantage at a time of accelerating technological progress, global liberalization and heightened market competition.

56. The difficulties inherent in designing strategies appropriate to a rapidly changing global business environment, especially at a time when the impact of industrial policy may be reduced by the globalization process, cannot be exaggerated. As Governments

liberalize, privatize and deregulate, the range and nature of national strategies and policies tend to become increasingly complex. Policies designed to foster specific sectors or industries will have to be adjusted within the framework of regional economic interdependence.

57. Against this background, the nature and role of industrial policy are changing; the Uruguay Round Agreements limit the use of tariff and non-tariff measures to protect infant industries; TRIMs restricts the use of trade-related measures to influence the pattern of FDI; industry location decisions are influenced more by growing crossborder linkages and the availability or otherwise of skilled labour than by government fiscal incentives.

58. Policy makers have chiefly responded by:

- Shifting industrial policy "upstream" away from interventions designed to protect and promote a specific industry or sector to more general strategies aimed at boosting economy-wide competitiveness indirectly - e.g. increased investment in infrastructure, education and R&D, improved transport facilities, greater support for technology development and technological transfer, along with a broader and more efficient range of industry-related service activities.

- Generally shifting away from inward-focused intervention in support of industries serving the domestic market towards enterprises targeting export markets.

- Putting greater emphasis on regional objectives - policies designed to help backward regions within a country, or backward countries within a region.

- Providing increased emphasis on industrial promotion, competitiveness and development of innovative technological capability at the enterprise level, including the restructuring and privatization of existing enterprises particularly in the countries in transition and in those developing economies with large State-owned enterprises and greater technological and institutional support for SMEs. This is possibly the field providing the greatest potential for industrial intervention in developing countries.

59. The industrial policy debate has focused on the extent and manner in which developing economies as a group can replicate the East Asian model of rapid, sustained, export-driven economic growth. Because there is no single East Asian model to emulate and no firm consensus on precisely which form of intervention will optimize industrial and economic growth in developing countries, industrial policy is best viewed as a menu of options. Furthermore, policies that succeeded under different global market conditions in the 1970s and 1980s may no longer be appropriate.

60. Two clear conclusions stand out:

- The need for some selective, targeted interventions; and

- The importance of outward-oriented strategies, whereby a country's manufacturing sector is driven by the discipline of market competition.

61. The more advanced the developing country, the greater the range of choice. In the least-developed countries with tiny markets, weak infrastructure and a poor skills and technology base, there may be little option but to focus on simple, consumer-based industries, initially at least. Given their small markets, their prospects for attracting major FDI inflows (other than into natural resource industries) are poor. For such countries, the option of shutting-out technology and FDI has no appeal, and they can do little more than seek to foster labour-intensive operations and develop an export-platform strategy, as in Mauritius.

62. Domestic rivalry is a prerequisite for competitiveness, underlining the role of competition policy in achieving competitive domestic markets. Technological upgrading and human capital investment are crucial to competitiveness in the 1990s and beyond.

63. Clusters and industrial districts have an important role in the development of globally competitive SMEs. Such is the pace of technological and organizational change that policies must be flexible and dynamic. Measures that succeeded in the 1980s may have already lost their viability.

64. Incentives are more likely to succeed than sanctions. Efforts to constrain FDI or limit technology imports run the risk of deterring investment. In an increasingly borderless world, potential foreign investors may merely take their operations elsewhere.

65. Structural adjustment programmes should include a specific strategy for manufacturing. The expectation that manufacturing will blossom in the absence of a coherent strategy has not been borne out by African experience.

66. In industrialized and transition economies as well as developing economies, industrial restructuring, including privatization, will only succeed if the policy framework is appropriate. In the past, interventionists have focused on picking winners, but in the 1990s and beyond, policy makers are required to anticipate losers - to forecast "sunset" as well as "sunrise" industry situations - and devise policies to mitigate the impact of industrial closures and retrenchments.

67. One of the most important lessons of the East Asian experience is that intervention worked where it was carried out in close coordination with the private sector within the framework of a market-driven economy. Industrial policy responded to the problems and needs of private enterprise rather than seeking to impose elaborate schemes according to the dictates of grandiose national plans.

68. Ultimately, competitiveness succeeds or fails at the enterprise rather than the national level. Governments can - and should - create an enabling environment for business and investment, but the choices of what to make and sell, and how and where to do it, must be left to entrepreneurs.

69. Industrial policy must have a social dimension. The economic integration of all segments of the population - disadvantaged groups from different social, ethnic and economic backgrounds - will require greater efforts than in the past.

OUTLOOK AND CONCLUSIONS

70. In 1975, the General Conference of UNIDO held at Lima set a target for the developing-country share of global MVA; the so-called Lima target was 25 per cent by the year 2000. This target is likely to be surpassed - the developing-country share had reached 20.3 per cent by 1994 - and the latest projections suggest that the developing world's share in global MVA will reach 30.6 per cent by 2005, while its share in global exports of manufactured goods will increase from an estimated 24 per cent in 1995 to 29 per cent at the turn of the century and to more than 35 per cent by 2005 (see Chapter 2).

71. UNIDO's baseline scenario assumes moderate GDP growth of 2.6 per cent a year in the G-5 countries along with continued global economic reform and trade liberalization, as well as low transport costs and moderate real interest rates. Under the baseline scenario, the industrialized countries' share of global MVA will continue to decline over the next decade, reflecting the fact that industrial production in the developing countries will grow by almost 7 per cent a year compared with just over 2 per cent per annum in the developed economies. MVA growth will accelerate in all developing regions over the forecast period, but East and South-East Asia will continue to grow far faster than any other region. As a result, the latter's share in global MVA will rise from 11 per cent in 1995 to more than 19 per cent in a decade's time. The developing countries' share of world MVA is set to grow rapidly from 21.5 per cent in 1995 to 30.6 per cent by the year 2005, although almost all of this growth will emanate from the high-performing Asian economies.

72. The scenario also suggests that the share of MVA in global GDP will rise marginally to 22.5 per cent in 2005 from 22 per cent at present. This reflects a sharp increase in the developing countries, where the share of MVA in GDP is expected to rise to 25.5 per cent from 21.3 per cent at present. Once again the trend is most marked in Asia, but industry's share of GDP is also forecast to improve in all other developing regions except Latin America.

73. The baseline scenario points to a strong growth of manufactured exports by developing countries, whose market share will rise from 24 per cent at present to more than 35 per cent by 2005. Again, the vast bulk of the increase in market share reflects greater market penetration by the East Asian countries, including China. Their share will rise from 17.8 per cent to 29 per cent over the period, at which stage they will account for more than 80 per cent of developing world exports of manufactured goods.

74. The analysis of industrial growth perspectives, during the next decade and beyond, highlights certain important conclusions:

75. First, the pace of industrialization and technological development in developing countries continues to be extremely uneven. Although spectacular industrial and export

growth has taken place in certain East Asian countries and, to a lesser extent, in some Latin American economies, industrial growth has continued to be slow in most other developing economies and has even deteriorated in sub-Saharan Africa. The technology gap between industrialized countries and most developing countries also continues to increase rapidly, particularly with respect to the application and development of new, generic technologies such as informatics, biotechnology and new materials.

76. Second, the impact of global economic developments and trends with respect to technological innovations, globalization, and liberalization of trade and investment following the Uruguay Round Agreements, is likely to be highly significant for developing countries, as also for transition economies. Enterprises from these countries need increasingly to compete in international markets. Industrial subsectors and niche areas with export potential will need to be identified and such enterprises must not only upgrade their technology usage and product quality but develop innovative capability for products, processes and related services in external markets.

77. Third, industrial policy reforms in developing countries and transition economies will need to be increasingly export-oriented and Governments in these countries will need to undertake selective policy interventions to redress market failures and facilitate industrial restructuring. It will also be necessary for Governments to ensure that the social objectives of industrialization are adequately achieved. This will require special emphasis on the promotion of SMEs and also of micro enterprises in less-developed regions, including rural areas, to provide increased employment and income to vulnerable sections of the population, particularly women. A more proactive role for Governments may be particularly necessary in African countries, and in some countries in other regions, where this pursuit of increased competitiveness and sustainability of industrial growth, following the Uruguay Round, will necessitate considerable restructuring of industrial subsectors and enterprises.

78. Finally, the industrial growth perspectives emphasize the necessity for specialized industrial services through international institutional support. The development and upgrading of technological capability, the enhancement of competitive export-oriented production and marketing, the industrial restructuring of potential-growth subsectors and of export-oriented enterprises, the promotion of external linkages and alliances, and the key and changing role of Governments in developing countries undoubtedly require specialized support services of increasing complexity and magnitude. The pattern of industrialization in the increasingly competitive global environment must be based on an integrated industrial strategy covering interrelated functions, services and programmes. It is vital, for this purpose, that well-defined technological and other support functions are provided at the international level to transition economies and developing countries so as to ensure that competitive and sustainable industrial growth can be achieved in these countries during the next decade. It is in this context that the role of UNIDO should be considered.

UNIDO AND THE NEW PATTERN OF GLOBAL INDUSTRY

79. Increasing globalization and liberalization of trade and investment flows will inevitably add significantly to the complexities of achieving competitive and sustainable

industrial growth in developing countries. Greater interdependence implies increased cooperation and partnership, and the need for increased technical cooperation with developing countries and transition economies to enable them to achieve their industrial objectives. As the process of liberalization and deregulation gather pace, there will be a growing need for international assistance to provide a wide range of specialized industry-related services with respect to policies, institutional support and enterprise-level assistance.

80. Interdependence implies cooperation and partnership, and globalization itself is an exercise in crossborder cooperation and links of various kinds. In the 1990s, and beyond, UNIDO is committed to a larger role with respect to policy advisory services and the reorientation of industrial support institutions to reflect a greater emphasis on the development of private enterprise in a market-driven environment.

81. While private enterprise will be in the driving seat in the twenty-first century, a key role for UNIDO is envisaged as a catalyst, promoter and facilitator of industrial development:

- UNIDO has a crucial role to play in technology transfer and in the technological upgrading of developing countries, especially the less-developed States. UNIDO is ideally placed to facilitate crossborder flows of ideas, information and technologies and more so than private-sector entities. This is one area where market failure is endemic. It is also an area where developing countries are exposed to severe competitive disadvantage, highlighting the need for UNIDO to facilitate technology transfer and assist in technology upgrading and human capital investment.

- All over the world, policy makers attach great importance to the potential of SME development. UNIDO's long record in the field of SME promotion and the many advantages it can draw upon from its global operations underline the contribution it can make in this area.

- Given the growing importance of foreign direct investment in the global economy, UNIDO's experience in investment promotion is an invaluable asset, especially for developing countries seeking to attract foreign investment. The Organization's activities in investment promotion and technology transfer will need to be expanded significantly so that it can develop and strengthen networks to establish linkages between partners in different countries. At present, no international institution provides such a facility.

- Industrial restructuring is taking place in most regions and UNIDO has the capacity to ensure that the lessons learned from privatization or restructuring in one country are available to others engaged in the same process.

- Industrial policy is a complex area. UNIDO's international exposure means that it can draw on the experiences of other member States, thereby facilitating the transfer of "experience" across borders and strengthening demonstration effects.

- UNIDO is also committed to the substantial expansion of programmes to support entrepreneurial development and institution building, especially, but not only, in Africa.

82. Assistance of the kind proposed will strengthen market forces and private enterprise. Fundamentally, UNIDO aims at improving the efficiency of markets through the dissemination of information, diffusion of technology, upgrading of skills, enhancement of competitiveness, twinning of potential partners, facilitation of SME development, rural industrialization, and promotion of investment in industry.

83. UNIDO has launched seven major programmes covering:

- Strategies, policies and institution-building for global economic integration.

- The linkage of industry with agriculture in Africa and the least-developed countries (LDCs).

- Energy use and the environment, capacity-building for environmentally sound industrialization, the establishment of cleaner production centres, the transfer of environmentally friendly technologies, and improving the efficiency of energy use in industry;

- The enhancing of innovation, technology, productivity and quality for international competitiveness.

- Industrial information.

- Policies and networking for small- and medium-sized enterprises.

- Rural industrialization.

84. UNIDO is uniquely positioned to provide a comprehensive programme of services and support for industrial evolution in economies in transition and in developing countries. Given the central role of private enterprise in accelerating industrialization and economic growth, UNIDO is fostering linkages with private-sector organizations and institutions - such as chambers of commerce and industry - with a view to training staff, supplying equipment, providing advice and developing information services, and thereby helping to build capacity. With the emerging complex pattern of global industry in the next decade and thereafter, the demand for UNIDO's specialized services for industry are expected to be greatly enhanced. These will extend not only to policy advisory services but to institutional support services and the development of increased technological and competitive capability for industrial enterprises in these countries to compete in international markets.

CHAPTER 1. INDUSTRIALIZATION AND DEVELOPMENT

GLOBAL INTERDEPENDENCE: A WIN-WIN FORMULA

1. The global industrial scene has undergone considerable transformation and far-reaching changes in recent years. Revolutionary technological development, particularly in informatics, biotechnology and new materials are having a major impact on products and processes, and on industrial organizations and management, in most production and service sectors. The liberalization of investment and technology flows are bringing about increasing globalization of markets and of production and marketing arrangements. The Uruguay Round Agreements herald a new era of liberalization of global trade. The policy response of developing countries and countries in transition from centrally-controlled economies has, almost invariably, taken the form of increased market orientation and greater emphasis on private-sector development. The interplay of economic, technological and other factors in this new setting is expected to result not only in enhanced global interdependence but the development of new partnerships and relationships between enterprises in different countries.

2. The global search for new markets, new opportunities for investment, new ways of cutting costs and of sourcing inputs emphasizes growing interdependence in the world economy. Today, few Governments, enterprises or labour unions make important strategic decisions without first taking explicit account of events and developments beyond their national borders. When a German motor vehicle manufacturer considers investing abroad it must take account not just of the attitudes and policy of the host Government, but also of its own Government at home, its shareholders and its workforce. When a transnational corporation (TNC) launches a new product, mounts a fresh advertising campaign or cuts prices in North America it knows it may spark retaliation by one of its competitors in many different markets around the world.

3. There are few better examples of growing interdependence than the manner in which, during the recession of the early 1990s, there was a shift in the comparative role of increased economic growth from the industrialized north and west to the high-performing economies of East and South-East Asia. While real GDP in the Group of Seven countries was growing at less than 2 per cent annually during 1991-1994, several East Asian economies were expanding at over 8 per cent a year, not only increasing their share of global economic activity but also creating new market opportunities for recession-stressed enterprises in other regions, including the industrialized economies and countries in transition. Developing economies provided markets for some three-quarters of the increase in world exports, and United States exports to emerging economies grew at 10 per cent annually during 1991-1993 - five times as fast as United States sales to other industrial economies.

4. Today nothing happens in isolation; the Mexican financial crisis of 1994/95 had temporary adverse ramifications not just for some of its neighbours but also for emerging markets generally as well as for the United States dollar. Similarly, recent research on global economic performance contrasts the positive spillover effect of fast-growing regional clusters in East and South-East Asia with the adverse contagious effects of generalized stagnation in many parts of sub-Saharan Africa.

5. While the lesson for developing countries is obvious - those who fail to lock into the global integration process risk being left behind industrially and in socio-economic terms - the implications for the developed market economies are equally stark. No country can isolate itself behind tariff walls or other barriers. Even if it were feasible, prosperous nations cannot afford to disregard the plight of the least developed countries. The increased proportion of the global aid budget earmarked for emergencies in the developing world is a reminder that where problems are left to fester and spread, one country's crisis soon takes on a regional, if not an international, dimension. Funds invested now in industrial projects that generate jobs and alleviate poverty help prevent subsequent economic, social and humanitarian crises.

6. Unemployment, political instability, civil unrest, drought and disaster in Africa, Asia, Latin America, the Middle East or the countries in transition quickly translate into social problems in Europe or North America. National boundaries do not block the crossborder migration of the unemployed, the dispossessed, the refugees and the sick. Drug trafficking and money laundering are as much - if not more - a crisis for the industrialized countries as for the developing world.

7. The international community should not lose sight of the socio-political dimensions of global interdependence. The 1994 *World Competitiveness Report* quotes the remark of a developing country minister to a western colleague:

> "If you don't want to take our products today then tomorrow you will have to take our people".[1/]

8. Fortunately, globalization is not a zero-sum game. Enhanced global competition and the growing crossborder mobility of capital, technology and skills heightens interdependence by forcing firms to consider locating different value-adding activities in different economies where labour, transport or marketing costs are lower. Cost-price differences between developing and industrial countries are roughly twice the average of those between industrialized economies, underscoring the extent to which specialization and efficiency gains accrue to the developed market economies when they buy from, or produce in, developing countries.

9. Because the costs of providing services in the developing economies and also in the countries in transition - including research and development, software design and data processing - are far lower than in North America, western Europe and Japan, there are substantial cost savings to be made from outsourcing such activities.

10. For their part, the developed market economies benefit from increased market opportunities generated by rapid *per capita* income growth in the developing countries and countries in transition. Roughly half the increase in industrialized country exports to the developing world since 1985 is attributable to developing economy growth alone. Projections suggest that growth in developing countries could account for up to three-

---

1/ World Economic Forum, *The World Competitiveness Report, 1994*, p. 13.

quarters of the increase in their imports from industrialized economies over the next decade.

11. The participation of foreign investors in such markets may take various forms, ranging from direct export to licensing of technologies and product brand names; joint ventures or foreign direct investment (FDI) in wholly-owned subsidiaries. This will depend on a whole host of considerations, including the policy environment of the host economy, its location *vis-à-vis* the main markets, its skills and technological capability and the pattern of its resource endowment. Some of these options - such as non-equity ties - might benefit developing countries considerably more than direct imports from industrial countries. Industrial policy - in the broad sense of appropriate macroeconomic strategies and targeted selective interventions - has a role to play in ensuring that developing economies exploit these opportunities to the full.

12. The World Bank's scenarios suggest that developing countries will account for 38 per cent of world output growth during the 1995-2010 period, up from 22 per cent in the 1980s. Their share of global output will rise from 21 per cent in 1994 to 27 per cent by 2010, and by then they will account for 56 per cent of global consumption and 57 per cent of worldwide capital formation.

13. Fears that industrial economies are being deindustrialized ("hollowed out") by the relocation of manufacturing value-added in developing countries are not supported by the evidence. Over the past quarter of a century, net FDI flows to the developing world amount to only 2 per cent of the capital stock of industrialized economies and, while net capital outflows may reduce capital formation in the developed market economies, they also have a positive feedback effect in the form of demand for industrialized-country exports.

14. Although unrestricted crossborder flows of speculative capital have destabilized currencies and even Governments, there are real gains to be made from financial integration. Industrialized country investors buying shares on emerging stock markets can both increase their rate of return while maintaining or even reducing their risk exposure by dint of intelligent portfolio diversification. At the same time, the inflow of portfolio funds deepens emerging stock markets, improving market liquidity, broadening market access for developing world companies and lowering their cost of capital. Here too there are gains on both sides, especially since portfolio investment may be the forerunner of non-equity links, joint ventures and FDI. However, the Mexican experience of 1994/95 is a reminder to developing country Governments to monitor such flows which have their downside in the form of sudden and substantial reverses that impose a heavy burden on the host country's balance of payments, its exchange rate and macroeconomic stability.

15. The recent focus on the distribution of the gains from trade and capital market integration risks losing sight of one vital aspect. Developing economies are not a homogeneous group of countries sharing the benefits of integration and interdependence. The challenge for the next decade is not only that of narrowing the income gap between the industrialized North and the developing South, but also of tackling the fast-growing differential between social and economic standards in newly industrializing Asia - and

to a lesser degree - Latin America - and those in the least developed countries, especially sub-Saharan Africa.

16. The most vulnerable countries appear to be those whose "interdependence coefficient" is lowest; those least integrated with the global economy in terms of exports, FDI and non-equity links; those for whom manufacturing accounts for less than one tenth of GDP. The challenge is how to integrate small, technologically backward economies, with a limited industrial base, with the developing world high flyers. A failure to do so would not just perpetuate and exacerbate the widening gap between haves and have nots among developing countries but expose the global economy to the negative aspects of interdependence. If this is allowed to happen, a potential win-win situation could all too easily degenerate into a lose-lose scenario.

INDUSTRIALIZATION AS THE MAINSPRING OF ECONOMIC GROWTH

17. Industry - and, more specifically, manufacturing - is synonymous with development. Rich countries are more industrialized than poor ones, and all major economies have followed the industrialization route to prosperity. It is no accident that in the LDCs the share of manufacturing value-added (MVA) is typically less than 10 per cent of GDP, compared with an average of 41 per cent in the high-performing economies of East Asia. Industrialization is the centrepiece of the development agenda, especially in least developed countries (LDCs), where it must drive economic transformation.

18. The East Asian newly industrializing economies (NIEs), like other countries with weak or narrow natural resource bases, had little option but to industrialize in order to generate employment, earn foreign exchange and raise living standards. Technological development is most rapid in manufacturing and related service activities, and States that neglect their industrial sectors run the risk not just of being left behind technologically, but of being vulnerable to the vagaries of commodity price fluctuations and, for much of the past 25 years, deteriorating terms of trade.

19. Over the past 50 years, industrialization has transformed the economies of the OECD nations socially as well as economically, and in the past two decades the same process has reached an advanced stage in some newly industrializing economies, especially, but not only, in East and South-East Asia. While developing countries' share of global MVA has more than doubled since 1960, rising from 8.6 per cent to an estimated 21 per cent in 1995, progress has been uneven. The main gains have been confined to a relatively small handful of mainly Asian economies, including China.

20. UNIDO's constitution, adopted in April 1979, describes industrialization as a dynamic instrument for growth, which is essential if developing countries are to make rapid economic and social progress, and living standards and the quality of life of people in all countries are to improve. UNIDO's primary objective is the furtherance and acceleration of industrial development in the developing countries, and the promotion of industrialization and cooperation at global, regional, national and sectoral levels. This task has become all the more urgent with the emerging global pattern of industry, the phenomenon of "jobless growth" in many economies, increasing economic and social

interdependence, and the widening gap between successful emerging economies and those, particularly in sub-Saharan Africa, that continue to stagnate.

21. At the same time, industry's catalytic role in the development process is changing in response to rapid, accelerating technological change, sweeping trade liberalization, far-reaching deregulation of markets - including the privatization and commercialization of State-owned enterprises - and the globalization of international business.

22. The importance and relevance of industrialization for developing countries and economies in transition are highlighted by a number of factors outlined below.

1. Industry's role as a generator of resources

23. Industrialization is more than the engine of economic growth; it is also responsible for the technological, financial and socio-economic transformation of the developed-market economies of North America, the European Union and Japan. Economic growth, driven by industrialization, has multiplier effects across and within economies, and contributes not just to improved living standards but to cultural change and lowered rates of population growth. In addition to the improvements in income and output achieved via industrial development, a developing country benefits enormously from the diversification and modernization of its economic base, involving the adoption of new and higher value-added activities.

2. Industry as a promoter of structural change

24. The share of MVA in a country's GDP is a broad indicator of structural change. The share of agriculture declines sharply during the transition as value-added shifts from primary production to manufacturing and services.

25. Economies typically follow an S-shaped industrial growth path, with structural change starting at low *per capita* income levels when manufacturing's share of GDP is 10 per cent or even less. The pace of structural change then accelerates and rising incomes reach a peak at intermediate income levels. Thereafter, industrial growth flattens out as service activities become the lead sector of the economy.

26. The composition of manufacturing output also alters considerably during the process of structural change. **Early** industries - such as food processing, clothing and textiles - take root at low income levels and satisfy basic needs. Typically, their share in GDP remains static during the transition, at around 7-8 per cent. Within manufacturing, their share declines, except where industries become major exporters.

27. **Middle** industries, supplying intermediate inputs to sectors such as chemicals, non-metallic minerals, plastics and petroleum refining typically double their share in GDP from 3 per cent to 6 per cent. Their expansion is largely a function of the development of inter-industry relations, and can be fuelled by rapid primary-sector growth in agriculture, energy and mining.

28. **Late** industries account for most of the increased share of manufacturing's increased share in GDP during the later, higher-income phase of structural change. Normally, this group includes some intermediate items (such as paper), producers of equipment and machinery, and consumer durables. At low income levels, these industries typically account for less than 3 per cent of GDP, but reach 10 per cent by the end of the rapid transition stage.[2]

29. The pattern and rate of structural change will also be influenced by market size, a country's pattern of resource endowment and the thrust of economic policy. In addition, structural change is associated with shifts in comparative advantage, which moves from natural resource-intensive to labour-intensive and subsequently capital- and skills-intensive activities.

3. Industrialization and technological change

30. Industrialization is synonymous with technical progress. Invariably, if not inevitably, late industrializers are also technologically backward economies with low living standards and a workforce primarily engaged in low value-added activities. Increasingly, both the pace and nature of industrialization depend on a country's human capital endowment rather than its natural resource base; countries that fail to reach the industrialization threshold thus risk a vicious circle of under-development.

31. In terms of demand, industrial development creates opportunities for technological advance, and for the creation and use of skilled workers. On the supply side, manufacturing growth is unlikely to progress beyond the "early-middle" stage without the heavy investment in technology and human capital that is an essential prerequisite of competitiveness in the 1990s.

32. Technical services that are crucial to the industrial development process are becoming increasingly complex - and costly. Enterprises that fail to keep pace with technological advances are condemned to lose market share in an increasingly competitive global economy. UNIDO has a vital role to play in providing advisory and technical services, while simultaneously helping developing countries to improve their own indigenous capability in this vital field.

4. Industry linkages

33. Forward and backward linkages with primary production in agriculture, energy and mining are highly developed, even in some LDCs; more importantly, however, manufacturing has spawned a comprehensive network of linkages with the service activities, and especially information services, that are a crucial element in technological progress in industry.

---

[2] Moshe Syrquin and Hollis Chenery, "Three Decades of Industrialisation", *World Bank Economic Review*, Vol 3, No 2, May 1989.

34. Linkages between manufacturing and the construction sector are particularly strong, while construction plays a vital complementary role in capital formation. Connections with agriculture are especially important during the initial phase of industrialization, when agricultural expansion stimulates demand for industrial products, at the same time supplying food for the industrial workforce and raw materials for agro-based activities, and earning the foreign exchange needed to finance imports of capital equipment, spares and components. Industry expands by supplying farmers with intermediate inputs such as agricultural machinery and implements, irrigation equipment, harvesters, chemicals and pesticides.

35. However, East Asian data show that manufacturing utilization of agricultural inputs falls sharply as industrialization moves towards higher value-added and more capital-intensive activities.[3/]

5. Industry and services

36. Industry is normally taken to be synonymous with manufacturing, but the term "industrialization" has a broader meaning, embracing a wider spectrum of productive activities linked to, or stimulated by, manufacturing proper. In recent years, manufacturing has spawned a comprehensive network of linkages with service activities and especially information services, which play a central role in technological advance. Industrialization stimulates a wide range of industry-related services, including consultancy, design, engineering, market research, quality control, software development and numerous, diverse financial and information processing services.

37. Direct employment creation in industry has slowed as a consequence of economic progress, structural change, industrial restructuring and technological advance. While the restructuring and outsourcing of services previously performed in-house by industry has meant job losses, the indirect job-creation capability of manufacturing has been much understated. Research shows that because of inter-industry and cross-sector linkages, the indirect employment effects of investment in industry are large relative to its direct impact.

38. During the early stage of industrial development, when inter-industry linkages are weak and *per capita* incomes low, indirect job creation is very limited. In the early stages of development, such services are either undeveloped or provided at informal-sector level, but they become increasingly integrated into the formal economy as the development process gathers momentum. Output and employment associated with personal services (the leisure industry, domestic services, repairs and maintenance) are driven by the indirect income-induced effects of manufacturing development The same applies to the provision and sophistication of social services.[4/]

39. As linkages develop, so increasing numbers of indirect jobs are created because of industrial growth. Industry-related services (IRS) cover a wide range of activities from

---

3/ UNIDO, *Industry and Development - Global Report 1992/93.*

4/ V. Richardson, *Industry, Employment and Income Generation*, UNIDO, 1995 (mimeographed).

consultancy to design and engineering, software development, quality control, market research, R&D, and a broad range of financial, legal and information-processing services. The process of externalizing such services, as part of industrial restructuring, has been termed relocating the "industrial brain" - the functions associated with the development, technological updating and management of industrial relations - from industry proper to the suppliers of services.[5/] Knowledge is estimated to account for 70 per cent of the development costs of an industrial product but for 90 per cent of services costs.

40. In the 1980s there was a dramatic expansion in such outsourced or externalized operations, and thus a massive redistribution of employment from manufacturing industry to the services sector - itself heavily reliant on manufacturing sector demand. In the United States, industrial employment held steady at 34 million people during the 1980s while service-sector employment increased by 25 per cent to 92 million jobs. Many - perhaps most - of these jobs were created in small and medium-scale enterprises (SMEs) as major corporations restructured and outsourced support services.

41. In the European Union, industrial employment fell nearly 20 per cent to 38 million people during 1980-89 despite manufacturing investment of $1.3 billion (1985 prices), but this loss of 8 million jobs was more than offset by the creation of 10 million new posts in services, which took total employment there to 63 million people.

42. IRS have become an important contributor to productivity and efficiency improvements:

- Specialized technological services, previously available only to large firms, can now be bought-in by SMEs, thereby accelerating the pace of technology diffusion;

- The process of technology transfer has been revolutionized, enabling developing countries to access technology in a more flexible and efficient manner; and

- New firms no longer need to be self-sufficient in service operations but can purchase them in the marketplace, thereby reducing entry barriers to corporate formation.

43. The unbundling of technology in this way is a major advantage for developing-country firms, which are now able to upgrade gradually on a piecemeal basis, thereby lowering threshold costs and entry barriers to high-tech activities. But because the service sector is undeveloped in most of the developing world, large firms and parastatals still perform many of these tasks in-house, and States must import services from specialist suppliers offshore.

44. Table 1.1 puts the 1990 value of IRS in the global economy at $3.29 trillion, of which the developing-country share was just 18 per cent. Low-income economies, excluding China and India, accounted for 4 per cent of the total.

5/ UNIDO, *Development of Industry-Related Services in the Magreb Union* 1992.

45. The table assumes IRS costs of 15 per cent of gross fixed capital formation (GFCF) and "optimal" IRS spending to support production activities of five times IRS expenditures during the pre-investment and investment stages.

Table 1.1. Estimated value of industry-related services (IRS) in the global economy, 1990 ($ billion)

Grouping	GDP	GFCF	As percentage of GDP	IRS for investment stage[a]	"Optimal" IRS[b]
World	22,299	4,383	..	658	3,290
Low-income economies (including India and China)	916	183	20	27	135
Middle-income countries	2,438	610	25	92	460
Total developing countries	3,354	..	..	119	595
High-income countries	15,316	3,590	22	539	2,695

Source: UNIDO, *UNIDO and Industry Related Services*, 1993.

a/ Gross fixed capital formation of 15 per cent.
b/ IRS for investment multiplied by five.

46. Developing countries as a whole have a negative trade balance in services, relying heavily on foreign suppliers, although the NIEs have developed consulting and contracting services. In 1990, the IRS requirement for developing-country capital formation of $790 billion was estimated at $120 billion (or 15 per cent of GFCF). In the same year, developing countries are estimated to have imported $73 billion of IRS, implying that approximately two-thirds of their requirements for new investment projects were supplied from offshore.

6. Industrialization and exports

47. Since the mid-1970s, world trade volumes in manufactures have grown substantially faster than exports of primary products, while, until 1993, the terms of trade moved decisively in favour of exporters of manufactured goods. Between 1977 and 1994, the export volumes of manufactures from developing countries grew at more than 10 per cent per annum compared with 4 per cent a year for exports of primary products. Over the same period, the prices of manufactured exports by G-5 countries (ie France, Germany, Japan, the United Kingdom and the United States) more than doubled while the commodity price index for 33 non-fuel exports declined marginally.

48. Accordingly, developing-country exporters of manufactures benefited from both robust growth in sales volume and materially higher prices. Even after the strong 1994 recovery in commodity prices, the ratio of primary product prices to those of manufactures had narrowed from 2.44:1 in 1977 to 1.08:1 in 1994.

49. Not only are export markets for manufactures growing more rapidly, but industrial exporting exposes developing-country firms to the competition and discipline necessary for technological upgrading. Traditionally, developing-country exporters have been largely confined to commodity markets where the major determinants of competitiveness are cost, price and to a lesser extent delivery dates. The transition to industrial exports involves broader-based international competition covering design, style, quality, durability and after-sales service, and this necessitates a higher and more diversified skills and technology capacity than in commodity industries.

50. Manufactured exports contribute to development by:

- Generating the increased foreign-currency earnings needed to finance invisibles payments, including debt-service, and essential imports of capital equipment;

- Enabling manufacturers to escape the constraint of a small domestic market and secure scale economy and experience effects, thereby cutting costs and boosting efficiency; and

- Enabling firms to "grow" comparative advantage rather than be locked into dependence on resource-driven advantages.

7. Industrialization and poverty alleviation

51. Poverty alleviation heads the policy agenda in most developing countries. Given the often disappointing track record of "trickle-down" effects, many Governments have implemented industrial policies - such as rural industrialization, regional development, and the promotion of small and medium-sized enterprises (SMEs) - that are targeted specifically at poverty alleviation.

52. Experience suggests that while a formal industrial strategy may not always be a cost-effective vehicle for combating poverty, industrial development is certainly of vital importance in job creation and additional income generation. In one of China's poorest regions, the Government took the enabling environment route, investing in infrastructure and leaving it to entrepreneurs to decide where and how they wished to develop. Today, poverty has been significantly reduced and southern China's economy has enjoyed one of the fastest growth rates in the world. Industrial development can - and will - alleviate poverty where appropriate policies are applied. UNIDO data show a strong correlation between income growth and social development:

- Infant mortality rates fall sharply as *per capita* incomes rise to about $2,000 (in 1980 dollars), and continue to decline (albeit more slowly) as incomes increase further;

- Life expectancy increases sharply when *per capita* incomes reach the $2,000 level, before flattening out and rising less steeply;

- The percentage of the population living in poverty falls as *per capita* income rises to $2,000;

- Daily calorie intakes rise strongly with *per capita* incomes;

- Adult illiteracy declines from around 70 per cent in the poorest countries to below 20 per cent when *per capita* incomes exceed $1,500; and

- Primary school enrolments are positively correlated with income per head up to $1,000, when they start to flatten out. Secondary school enrolment ratios rise steeply up to *per capita* incomes of $2,500, thereafter growing more slowly until income levels reach $7,000.

53. While relationships between income *per capita* and GDP do not necessarily reflect the impact of industrialization, Table 1.2 illustrates the linkage between manufacturing's share of GDP and income per head. The beneficial social effects of rising *per capita* incomes are thus also correlated with industrial development.

Table 1.2. Income levels and industrialization, 1993

Income group	Manufacturing's share in GDP, percentage
Low-income (excluding China and India)	13[a/]
China	38
India	17
Lower middle-income	18
Upper middle-income	21
Sub-Saharan Africa	16[a/]
South Asia	17[a/]
East Asia and Pacific	30[a/]

Source: World Bank, *World Development Report, 1995.*

a/ *Weighted.*

54. Half the variance in *per capita* GDP growth in 63 countries located in five developing regions is explained by just two variables—growth in manufacturing value-added, and in exports of manufactures. Thus, once economies begin to industrialize rapidly, MVA, GDP *per capita* and manufactured exports expand together.[6/]

8. Industry's contribution to socio-economic progress

55. Industrial development contributes to social development by creating jobs and producing appropriate goods at low prices to satisfy the basic needs of the poor and disadvantaged. Basic needs cannot be satisfied without rapid, sustained economic

6/ UNIDO Background paper, John Humphrey, *Industrialization in Developing Countries: The Challenges of Employment and Social Integration* (ID/WG.542/29 (SPEC.)).

growth. Few economies are capable of achieving such GDP growth without increased industrialization (the exceptions being those countries with a very rich resource base in energy or minerals). Strategies aimed at promoting socio-economic development require complementary policies to balance rural and urban growth, primary and industrial production, and labour-intensity with capital-intensive production technologies.

56. It is notable that the successful East Asian economies have not just achieved sustained rapid growth but have reduced inequality at the same time. Table 1.3 contrasts the increase in the Human Development Index (HDI) of East Asian States with that of developing countries as a whole and of sub-Saharan Africa, where industrialization has lagged, in particular.

Table 1.3. HDI values by region, 1960-1992

	1960	1970	1980	1992	Increase[a/]
All developing countries	0.260	0.347	0.428	0.541	0.281
LDCs	0.165	0.209	0.251	0.307	0.142
Sub-Saharan Africa	0.200	0.255	0.306	0.357	0.157
East Asia	0.255	0.379	0.484	0.653	0.397
East Asia excluding China	0.416	0.547	0.686	0.861	0.446

Source: United Nations Development Programme, *Human Development Report, 1994.*

a/ Absolute increase in HDI value, 1960-92.

57. The HDI grew fastest in East Asia (excluding China), more than doubling over the period. When China is included, the East Asian index rises by 0.397 points, well above the total for developing countries as a whole (0.281), LDCs (0.142) and sub-Saharan Africa (0.157). The report's list of top ten HDI performers during the 1960-92 period includes four East Asian industrializing economies - the Republic of Korea, Malaysia, Thailand and China.

58. At national level, too, there is a striking correlation between industrial development, measured by the share of manufacturing in GDP, and improved human development (see Table 1.4).

Table 1.4. Industrialization and social development

Country	Increase in manufacturing share of GDP in percentage points, 1970-1993	Absolute increase in HDI 1960-92
Hong Kong	8	0.314
Korea, Republic of	8	0.461
Malaysia	..	0.464
Singapore	8	0.317

Sources: United Nations Development Programme, *Human Development Report, 1994;* World Bank, *World Development Report, 1995;* UNIDO database.

59. The fact that those developing countries which have grown most rapidly are also those which adopted conscious policies designed to accelerate industrial development is also important. "A number of rapidly growing South-East and East Asian economies (Republic of Korea, Malaysia, Taiwan Province of China, Indonesia and Singapore) did not leave industrial development to the dictates of the free market even if they have often been anxious to impose market discipline on companies through trade policies with a net outward bias".[7/]

9. Industry and employment generation

60. Since 1965, industry's share of global employment has risen from 19 per cent to 31 per cent, while industrial employment in developing countries rose from 11 per cent to 15 per cent of the workforce between 1965 and 1990/92. Again, the most impressive gains were achieved in the newly industrializing countries (NICs), with industrial employment rising from 15 per cent to 36 per cent in the Republic of Korea, from 27 per cent to 35 per cent in Singapore and from 22 per cent to 29 per cent in Mexico. A similar trend is displayed by the second wave of NICs, i.e. Malaysia, Thailand and Indonesia.

61. Table 1.5 emphasizes not just the correlation between rapid industrialization and changing employment patterns but also the linkages between employment shares in manufacturing and the level of human or social development. Countries classified as medium human-development nations have more than doubled the ratio of manufacturing to total employment, while in low human-development regions and sub-Saharan Africa, declining shares of agricultural employment have not been matched by rising numbers of industrial jobs.

7/ *Ibid.*

Table 1.5. Industrial employment, 1965-92
Percentage of labour force in various sectors

Region/country	Agriculture 1965	Agriculture 1990/92	Industry 1965	Industry 1990/92	Services 1965	Services 1990/92
World	57	13	19	31	24	56
All developing countries	72	58	11	15	17	27
LDCs	83	73	6	8	11	19
Sub-Saharan Africa	79	67	8	8	13	25
Medium human-development	73	46	11	25	16	29
Low human-development	74	64	10	10	16	26
China	81	73	8	14	11	13
Hong Kong	6	1	53	35	41	64
India	73	62	12	11	15	27
Indonesia	70	56	9	14	21	30
Korea, Republic of	55	17	15	36	30	47
Malaysia	58	26	13	28	29	46
Mauritius	37	16	25	30	38	54
Mexico	49	23	22	29	29	48
Singapore	6	-	27	35	67	65
South Africa	32	13	30	25	38	62
Sri Lanka	56	49	14	21	30	30
Thailand	82	67	5	11	13	22

Source: United Nations Development Programme, *"Human Development Report, 1994"*.

10. Industrialization and rural development

62. The dispersal of manufacturing activities to less developed areas is accompanied by increased income-generating opportunities that have the added advantage of strengthened backward and forward linkages to the agriculture and services sectors. The establishment of medium, small and micro enterprises that are relatively more labour-intensive than large-scale manufacturing plants achieves greater national and local trickle-down effects in terms of job creation and reduced income inequality.

63. Industrial decentralization also fosters networks or clusters of SMEs providing inputs and services, often on a subcontracting basis. In addition, the spread of industry to backward areas will generate demand for public investment in physical and social infrastructure - such as schools, clinics, housing and roads - with beneficial socio-economic effects for the community.

11. Industrialization and gender equality

64. Various studies have blamed industrialization for the marginalization of women from formal-sector employment. Computer technology is said to erode developing-country comparative advantage based on cheap labour provided by female blue-collar employees, although the recent increased flow of foreign direct investment to low-wage

and low-cost countries, especially in Asia, suggests ongoing employment opportunities for women.[8/]

65. On the other hand, the changing nature of skill requirements can mean the displacement of female labour, even in expanding industries. Thus, in Malaysia, the adoption of modern management techniques in semiconductor production resulted in much-enhanced productivity but also led to reduced reliance on women workers. Whereas in the first phase of development of the Malaysian electronics industry up to 80 per cent of the workforce were women, the proportion had fallen to 67 per cent in 1986 and is even lower today.

66. In the pioneer days of Thailand's electronics industry, employers needed "the nimble fingers of women workers" to connect tiny wires to a semiconductor. In the 1990s, the same task is carried out by a machine, and as many as ten machines are controlled by a single worker.

67. The evidence is ambiguous; in the printing and publishing industry the introduction of electronic techniques led to an increased proportion of female employees in Denmark and the United States, while in some of the major foreign-owned banks in India 70 per cent of the workforce are women, compared with 5 per cent 25 years ago.

68. Clearly, it is unwise to generalize, since the pattern and nature of industrialization will have major implications for gender equality. In Mauritius, for example, industrial development in the form of achieving an export-oriented garments sector led to full employment, and work opportunities for women increased dramatically. In general, the more labour-intensive the process, the greater the reduction in gender inequality.

8/ UNIDO Background Paper, Swasti Mitter, *Does New Technology Bode Well for Working Women? An Evaluation and Analysis* (ID/WG.542/10 (SPEC.)).

CHAPTER 2. THE PRESENT AND FUTURE STATE OF WORLD INDUSTRY

69. Historically, industrialization has been a function of market size. Countries with large populations and/or high income per head have industrialized earlier and faster than small, poor nations. Over the past 25 years, however, a growing number of developing countries have bucked the trend, managing to develop large, dynamic manufacturing sectors - as measured by the share of manufacturing value-added (MVA) in GDP - primarily by becoming part of the globalization process, which has enabled them to industrialize despite small domestic markets.

70. Nevertheless, industrialization in the developing world has been an extremely uneven process. While the developing economy share of global manufacturing production doubled from 10.3 per cent in 1970 to 20.8 per cent in 1994 (Table 2.1), almost all this increase came from one region — South-East and East Asia including China, whose share rose almost fivefold from 2.1 per cent to 10.3 per cent, while the rest emanated from the Indian subcontinent (0.6 points) and North Africa and West Asia (1.9 points).

Table 2.1. Regional shares in global manufacturing production, 1970, 1980, 1990 and 1994

Region	1970	1980	1990	1994
Developed countries	85.6	79.7	78.1	76.6
Developing countries including China[a/]	10.3	14.8	17.0	20.8
Latin America	5.0	6.5	4.8	5.1
Tropical Africa	0.4	0.3	0.3	0.3
North Africa and West Asia	1.5	2.4	3.0	3.4
Indian subcontinent	0.8	0.9	1.3	1.4
East and South-East Asia	2.1	4.2	7.3	10.3

Source: UNIDO Issue Paper, *State of World Industry and Scenarios for the Post-2000 Period* (ID/WG.542/3 (SPEC.)).

Economic power is shifting

71. The most striking feature of world economic growth in the past decade has been the gradual shift of economic power from Europe and North America to the East Asian cluster of Japan and the newly industrializing countries (NICs) of East and South-East Asia. While Western Europe and North America have maintained their share of global MVA over the past 20 years, the East Asian cluster (excluding China) more than doubled its share from 10.9 per cent in 1975 to 22.5 per cent in 1994. If China is

included, the 1994 share of the East Asian cluster rises to 27.3 per cent (no directly comparable figures are available for 1975).

Table 2.2. Regional shares in world MVA, 1975 and 1994

Region	1975	1994
North America	24.7	24.9
Western Europe	32.7	33.2
Japan	9.3	16.9
Eastern Europe and former USSR	17.1	2.9
Latin America and the Caribbean	6.5	5.2
Tropical Africa	0.5	0.3
North Africa and Western Asia	1.3	3.4
Indian subcontinent	1.1	1.4
China	n/a	4.8
East and South-East Asia	1.6	5.6

Source: UNIDO, *Industrial Development - Global Report, 1995.*

72. This shift in the global location of industry has been accentuated by the—temporary—steep decline in industrial activity in the countries in transition, that is, the former centrally planned economies of eastern and central Europe. Their share of MVA collapsed from more than 17 per cent in the mid-1970s to an estimated 2.9 per cent in 1994.

Table 2.3. Share of manufacturing value added in GDP, 1960, 1970 and 1990
(Current prices and $ exchange rates)

Region	1960	1970	1990	+ or -
World	28.9	28.1	22.2	-
Developed market economies	29.0	28.2	22.6	-
Developing countries	19.4	18.9	19.6	+
North America	28.5	25.3	18.5	-
Western Europe	29.4	30.4	23.7	-
Eastern Europe and former USSR	42.4	42.2	36.8	-
Japan	34.6	36.0	29.1	-
Latin America	21.5	23.8	23.0	+ -
Tropical Africa	8.4	10.2	9.5	+ -
North Africa	12.9	12.1	12.3	-
Western Asia	12.4	13.1	12.5	+
Indian subcontinent	12.3	12.8	15.3	+
East and South-East Asia	15.2	19.0	26.4	+

Source: UNIDO Issue Paper, *State of World Industry and Scenarios for the Post-2000 Period* (ID/WG.542/3 (SPEC.)).

73. The main explanation for the declining share of MVA in GDP in the developed market economies (Table 2.3) appears to have been the shift in private consumption spending from manufactured goods to higher income-elasticity services, including tourism, and lower levels of gross fixed capital formation. The relocation from some regions in North America, western Europe and Japan to the developing countries of manufacturing in industries like steel, leather goods and textiles was another factor.

74. With the exception of Asia and Tropical Africa, MVA growth has slowed markedly since the mid-1970s, which represented a watershed in the pattern and pace of global industrialization (Table 2.4). Indeed, between 1970 and 1990 the share of manufacturing in global GDP fell 6.6 percentage points from 28.8 per cent to 22.2 per cent (Table 2.3), with the main losses occurring in the developed-market economies of North America, western Europe and Japan.

Table 2.4. World growth rates of MVA, 1970-94
(1990 US dollars)

Region	1970-80	1980-90	1990-94
North America	2.3	2.5	2.9
Western Europe	2.6	1.5	-0.1
Japan	5.2	5.8	0.0
Eastern Europe and former USSR	6.9	1.4	-13.2
Latin America and the Caribbean	6.3	-0.1	3.0
Tropical Africa	2.1	2.6	0.8
North Africa	6.1	5.6	1.4
Western Asia	8.8	5.1	5.5
Indian subcontinent	4.2	6.9	3.8
China	10.2	8.7	16.4
East and South-East Asia	11.4	8.5	6.3
Developing countries (including China)	7.5	4.3	6.6
World	3.7	2.8	1.4

Source: UNIDO database.

75. In developing countries as a whole, MVA growth increased marginally from 7.3 per cent a year in the 1960s to 7.5 per cent annually in the 1970s, before falling sharply to 4.3 per cent in the 1980s. Only in Asia did the share of manufacturing in GDP increase significantly, highlighting the yawning gap between South-East and East Asian countries (excluding China) - where MVA growth averaged 9.7 per cent a year during the 1965-90 period - and developing countries as a whole, where MVA growth averaged 5.8 per cent annually.

76. By the late 1970s, structural constraints on industrialization had become greatly accentuated in many developing countries. Limited domestic markets, the inadequacies of the import-substitution-industrialization (ISI) strategy, a failure - except on the part of the newly industrializing economies - to break into export markets and the impact of destabilizing exogenous shocks, most notably the two oil price crises, resulted in a global debt crisis, and in de-industrialization and falling incomes and employment in many countries.

There is no unique industrialization model

77. No single influence explains the success of South-East and East Asia, although the region's outward-orientation and capacity to compete with OECD players was undoubtedly a major factor. Thus Brazil's average annual GDP growth rate of 2.1 per cent (between 1980 and 1993) contrasts starkly with the Republic of Korea's 9.1 per cent a year. A major reason for the contrast is that the Republic of Korea's open economy, with an export:GDP ratio of 38 per cent, enabled it to generate extra resources to cope with debt-service payments far more effectively than Brazil, which had an export:GDP ratio of only 7 per cent.[1/] The most successful economies were those that best exploited globalization by rapidly expanding their exports of manufactured goods and attracting substantial inflows of foreign direct investment (Chapter 3).

78. In the 1990s, industrial development is increasingly driven by the forces of globalization—itself the product of worldwide liberalization and deregulation, rapid technological progress, and new systems of structuring and managing business. The pace of industrial expansion is closely correlated with foreign trade growth, specifically exports of manufactures, and foreign investment inflows, not just direct investment but also non-equity links and portfolio investment.

79. Unfortunately, the benefits of globalization have been largely restricted to a handful of East Asian and Latin American countries, whose outward orientation of trade and investment policies has enabled them to increase integration with the global economy. The challenge of the latter half of the 1990s and beyond is to broaden the globalization process so that it extends to the vast majority of less and least developed nations, especially, but not only, in Africa and the Middle East. The enormity of the challenge is illustrated by the comparison between industrial performance in East and South-East Asia and that in Tropical Africa (Table 2.5).

Table 2.5. Selected indicators: East and South-East Asia, and Tropical Africa, 1970-1993

Region	1970-80	1980-90	1990-93
East and South-East Asia			
GDP growth rate	8.1	7.1	6.3
MVA growth rate	11.4	8.5	6.3
MVA share of GDP	23.3	26.4	26.5
Labour productivity growth rate	3.1	5.9	3.9
Tropical Africa			
GDP growth rate	3.0	2.3	1.2
MVA growth rate	2.1	2.6	0.2
MVA share of GDP	9.6	9.9	9.8
Labour productivity growth rate	-0.2	1.1	-2.2

Source: UNIDO, *Industrial Development Report, 1995.*

1/ UNIDO Background Paper, John Humphrey, *Industrialization in Developing Countries: The Challenges of Employment and Social Integration* (ID/WG.542/29 (SPEC.), p. 10.

80. While manufacturing has been the driving force behind both economic growth and export expansion in East and South-East Asia, MVA per head in Tropical Africa has declined continuously for a quarter of a century while manufacturing's share of GDP remains below 10 per cent.

Structural change

81. Table 2.6 highlights the difficulties faced by late industrializers. The industries in which they are able to develop comparative advantage - processed foods, beverages and tobacco, clothing and textiles, footwear and some intermediate products - account for no more than one-quarter of world MVA. The fast-growth industries - such as electrical and non-electrical machinery, transport equipment, and chemicals - are dominated by industrialized and newly industrializing countries and account for more than 40 per cent of global output. Developing countries are also disadvantaged by the fact that the fastest growing sectors of manufacturing have been skill- and technology-intensive industries, such as scientific goods and plastics.

Table 2.6. Share of MVA of main industries, 1994

Industry	Percentage share in total MVA
Food	10.0
Beverages	2.3
Tobacco manufactures	1.7
Textiles	3.8
Clothing	2.1
Leather and fur products	0.3
Footwear	0.5
Wood and cork products	1.6
Furniture	1.4
Paper and paper products	3.1
Printing and publishing	5.0
Industrial chemicals	5.2
Other chemicals	5.7
Petroleum refineries	2.7
Miscellaneous coal/petroleum products	0.3
Rubber products	1.3
Plastics	3.0
Pottery, china and glass	1.3
Other non-metallic minerals	2.8
Iron and steel	3.7
Non-ferrous metals	1.5
Metal products	5.7
Non-electrical machinery	10.4
Electrical machinery	10.4
Transport equipment	10.2
Professional and scientific goods	2.7
Other	1.4

Source: UNIDO, *Industrial Development - Global Report, 1995.*

82. Table 2.7 illustrates the industrial sectors in which developing country manufacturers are building market share showing that share gains have been greatest in resource-intensive sectors (iron and steel, non-metallic products, petroleum refineries, coal and petroleum products and non-ferrous metals) and in labour-intensive,

technologically mature activities - leather and fur products, footwear, clothing, textiles and pottery. At the same time, developing countries have made substantial relative market share gains in some higher-technology activities, such as transport equipment and electrical machinery.

Table 2.7. Share of developing countries (including China) in global MVA, 1975 and 1994

Industry	1975	1994	Change in market share (percentage points)
Leather and fur products	22.5	43.0	+ 20.5
Textiles	26.8	40.6	+ 13.8
Petroleum refineries	28.6	39.0	+ 10.4
Footwear	20.0	39.0	+ 19.0
Tobacco manufactures	39.4	38.0	- 1.4
Iron and steel	13.5	36.8	+ 23.3
Non-metallic mineral products	18.3	33.0	+ 14.7
Clothing	14.5	32.5	+ 18.0
Pottery, china and earthenware	20.4	32.5	+ 12.1
Beverages	24.5	32.0	+ 7.5
Non-ferrous metals	13.0	26.0	+ 13.0
Rubber products	19.8	24.6	+ 4.8
Miscellaneous petroleum and coal products	11.6	24.3	+ 12.7
Other manufactures n.e.s.	13.7	24.0	+ 10.3
Glass and glass products	12.8	21.5	+ 8.7
Industrial chemicals	14.0	21.0	+ 7.0
Food manufacturing	16.1	20.9	+ 4.8
Other chemical products (including pharmaceuticals)	19.5	19.3	- 0.2
Electrical machinery	9.7	16.9	+ 7.2
Plastic products	16.1	16.8	+ 0.7
Transport equipment	8.1	16.0	+ 7.9
Metal products - excluding machinery	13.1	15.6	+ 2.5
Wood and cork products	13.1	15.4	+ 2.3
Paper and paper products	12.2	15.2	+ 3.0
Furniture and fixtures	11.9	14.3	+ 2.4
Non-electrical machinery (including office machines)	10.3	13.5	+ 3.2
Printing and publishing	9.8	9.0	- 0.8
Professional and scientific goods	5.6	7.6	+ 2.0

Source: UNIDO Issue Paper, *State of World Industry and Scenarios for the Post-2000 Period* (ID/WG.542/3 (SPEC.)), Table 5.

83. However, among developing countries, only East and South-East Asia have increased their market share in capital- and technology-intensive activities, while developing countries as a whole have made most progress in textiles, clothing and footwear, where MVA growth rates have been below average in recent decades.

84. Thus in footwear, where developing countries account for 39 per cent of global production (see Table 2.7), output declined by 1.4 per cent a year during the 1980s, and by 1.2 per cent annually during the 1990-93 period. Similarly, in textiles, where developing countries control 40.6 per cent of global production, output was flat during the 1980s, falling 1.1 per cent a year between 1990 and 1993.

85. Sluggish demand growth notwithstanding, developing countries have built impressive market shares over the past 20 years. However, the sectors in which developing countries have increased their market share the most account for less than

a quarter of world production. In other words, developing countries are building market share mainly in sectors that command small - or declining - shares of global production.

The de-linking of employment from growth

86. The period from the 1950s to 1975 marked the "golden age" of manufacturing development in developing countries. Industry diversified as new sectors developed and, for a long period, the ISI strategy generated growth in both manufacturing output and employment.

87. Until the mid-1970s, the manufacturing sector grew sufficiently rapidly in developing countries to create enough new jobs to keep pace with non-agricultural employment growth as a whole. In sub-Saharan Africa and South-East and East Asia, employment growth in the period 1965-80 far exceeded the underlying growth rate of non-farm employment. Similarly, in Latin America, the Caribbean and South Asia, growth in manufacturing employment accelerated in the 1970s, creating jobs more rapidly than other non-agricultural sectors.[2/]

88. The first oil price crisis, the subsequent world recession, rampant inflation and the third world debt crisis signalled the end of the golden age and the onset of a new, ominous period of jobless growth. With the exception of South-East and East Asia, MVA growth and industrial employment generation in developing economies slowed after 1975, while in the first half of the 1980s manufacturing employment actually fell in South Asia, Latin America and sub-Saharan Africa.

89. Even so, up to 1980 the growth rate of direct employment in manufacturing exceeded that of the non-agricultural work force (Table 2.8), which has averaged 3.9 per cent a year since 1950. Industrial development also generated substantial indirect employment in the services sector (Chapters 1 and 8).

90. The employment elasticity of industrial growth in developing countries has been estimated at between 0.4 and 0.7 over the last three decades - which means that for every 10 per cent increase in MVA, industrial employment rose between 4 and 7 per cent. However, recently employment elasticity has fallen significantly in many developing economies reflecting accelerating technological progress and the diverging rates of growth between slow-expansion,low-technology labour-intensive industries and rapid-growth, high-tech sectors where employment elasticities are low.[3/]

2/ UNIDO Background Paper, Humphrey, *op. cit.*

3/ UNIDO Issue Paper, *State of World Industry and Scenarios for the Post-2000* (ID/WG.542/3 (SPEC.)).

Table 2.8. Manufacturing employment, 1965 - 1990
(Percentage growth per annum)

Region	1965-70	1970-75	1975-80	1980-85	1985-90	1965-90
Sub-Saharan Africa	6.0	5.8	4.8	-0.4	-1.1	3.0
South Asia	2.0	3.9	4.0	-0.7	3.5	2.5
South-East and East Asia (excluding China)	6.3	7.4	7.5	3.4	4.1	5.9
China	..	..	2.6	4.1	5.3	..
Latin America and the Caribbean	2.6	5.8	4.4	-0.6	-0.3	2.3
Developing countries (excluding China)	3.4	5.6	5.1	1.0	2.1	2.1

Source: UNIDO database.

91. The slowdown in direct employment generation in manufacturing is partly a function of structural change, explained by the shift away from labour-intensive industrialization since 1975. Employment growth in sectors like food, textiles, leather and furniture - the usual industrialization "entry point" for LDCs - has been relatively slow and their share of employment has declined in all but three of the 15 countries listed in Table 2.9 (the exceptions being Kenya, Mauritius and Sri Lanka).

92. While traditional labour-intensive activities have lost ground, employment in machinery and equipment industries has grown strongly, particularly in the more advanced developing countries. In 1975, Singapore was the only one of the 15 economies in Table 2.9 to have more than one-quarter of its industrial work force engaged in sector 38 (machinery and equipment), but by 1990 the number of such economies had increased to seven, reflecting two distinct trends:

- Growing employment in labour-intensive activities in the electrical and electronics industries; and

- Industrial deepening as the non-electrical machinery and transport equipment sectors developed.[4/]

Divergent regional trends

93. Structural change has been greatest in Asian industry, with the employment share of labour-intensive sectors falling sharply from 56 per cent in 1975 to 45 per cent in 1990. The main shift was towards the machinery sector, where employment trebled.

94. A similar, less marked trend occurred in Latin America, though here the main shift was from labour-intensive jobs to intermediate goods industries such as chemicals,

4/ UNIDO Background Paper, Humphrey, *op. cit.*

paper and printing, rubber, plastics, non-minerals and metals, and petroleum refining. This reflected the region's strong resource base and reliance on ISI until the mid-1980s. In South Asia, India moved towards machinery and equipment activities but Sri Lanka increased its dependence on labour-intensive operations. In sub-Saharan Africa, employment in labour-intensive industries fell marginally in three sectors but increased in two.

Table 2.9. Manufacturing employment by sectors, selected developing countries, 1975 and 1990

Country or area	Employment in sectors 31-38		Sectoral distribution (%)[a]					
			Sectors 31-33		Sectors 34-37		Sector 38	
	1975	1990	1975	1990	1975	1990	1975	1990
	(Thousand)							
Ethiopia	60	102	80.5	79.4	17.4	18.0	2.1	2.6
Kenya	99	164	54.7	56.4	20.8	23.4	24.5	20.1
Mauritius	21	104	67.4	88.9	12.7	7.0	19.9	4.1
Zimbabwe	144	181	55.0	52.5	22.0	27.6	23.0	19.9
Tropical Africa	1,341	1,567	66.5	69.8	20.8	20.0	12.8	10.2
India	5,650	7,265	49.5	44.0	32.1	30.4	18.5	25.6
Sri Lanka	187	231	67.1	69.6	22.6	24.6	10.3	5.8
Indian sub-continent	6,655	9,268	55.1	51.2	25.8	27.8	19.2	20.9
Hong Kong	660	686	59.3	51.4	16.5	17.9	24.2	30.7
Indonesia	869	2,619	73.9	66.7	18.8	23.2	7.3	10.0
Korea, Republic of	1,298	2,890	48.8	32.6	28.5	28.1	22.7	39.3
Malaysia	283	823	46.6	35.8	29.5	25.6	23.9	38.6
Singapore	187	344	30.3	16.1	18.0	16.6	51.7	67.3
South-East and East Asia	5,709	12,351	54.9	47.9	23.6	23.9	21.5	28.2
Colombia	442	517	52.6	46.9	29.6	36.6	17.8	16.5
Ecuador	73	111	64.9	56.5	30.2	30.7	4.9	12.8
Mexico	413	1,060	34.7	29.6	41.5	42.6	23.7	27.8
Venezuela	324	458	47.6	42.4	33.6	39.1	18.8	18.5
Latin America and Caribbean	9,906	11,699	48.7	48.2	26.1	28.4	25.1	23.4

Source: UNIDO Background Paper, Humphrey, *Industrialization in Developing countries: The Challenges of Employment and Social Integration* (ID/WG.542/29 (SPEC.)), Table 1.4; and UNIDO database.

a/ Sectors 31-33: food products, textiles and clothing leather, wood and furniture. Sectors 34-37: paper, chemicals, rubber, plastics, metals. Sector 38: metal products, machinery and equipment (electrical and non-electrical).

Competitiveness as the engine of growth

95. While increased global trade and foreign investment flows have constituted major elements of the globalization process, it is global competitiveness which has emerged as the principal engine of industrial growth and of exports of manufactured products. Since 1986, international trade in goods and non-factor services (exports plus imports) as a proportion of developing economy GDP has risen from 33 per cent to 43 per cent, while FDI inflows have increased sixfold.

96. The share of merchandise exports between developing countries increased from 30.8 per cent in 1980 to 39 per cent by 1993. And developing countries' exports are no longer dominated by primary commodities - manufactures now account for almost 60 per cent of such exports, up from a tiny 5 per cent in 1955. Their share of world exports of manufactures more than quadrupled from 5 per cent in 1970 to 22 per cent in 1993.

Table 2.10. Developing countries' share of exports, selected industrial product groups, 1992

Product categories	Percentage share
Textiles and clothing	22.0
Electrical machinery	14.0
Metals	11.0
Mineral products, precious metals and stones	9.5
Non-electrical machinery	9.0
Other manufacturing	8.5
Leather, rubber, footwear and travel goods	7.5
Chemicals and photographic supplies	7.0
Wood, pulp, paper and furniture	5.7
Transport equipment	3.0
Fish and fish products	2.8

Source: General Agreement on Tariffs and Trade (GATT), *An Analysis of the Proposed Uruguay Round Agreement with Particular Emphasis on Aspects of Interest to Developing Countries*, November 1993.

97. Simultaneously, developing countries have become increasingly important markets for industrialized countries, increasing their share of world imports of manufactured goods from 5.5 per cent in 1970 to 17.2 per cent in 1991 (Table 2.11).

Table 2.11. Regional structure of exports of world manufactures, 1992

	Exports to developed countries		Exports to developing countries	
	$ billion	Percentage	$ billion	Percentage
Developed countries	1,480	54	550	20
Developing countries	330	12	370	14
World	**1,810**	**66**	**920**	**34**

Source: GATT, *International Trade Statistics*, 1993.

98. Not only have manufactured exports been rising as a proportion of total developing country exports, but exports of manufactures have grown more rapidly than MVA - albeit from a tiny base - in all developing regions except sub-Saharan Africa (Table 2.12).

Table 2.12. Growth of MVA and manufactured exports, 1965-90
(Percentage in constant 1990 dollars)

Region	MVA	Export of manufactures	Number of countries
Sub-Saharan Africa	225	132	24
South Asia	279	507	4
South-East and East Asia	640	1,116	8
China	222	2,300	1
Latin America	168	265	21
All developing countries (excluding China)	271	617	62

Source: UNIDO database.

99. However, here too the process has been uneven. While the export:GDP ratio for 27 developing countries virtually doubled between 1960 and 1990, rising from 15 per cent to 28 per cent, it declined in sub-Saharan Africa, was barely changed in South Asia and only started to increase modestly in Latin America from 1975. Most of the increase came from South-East and East Asia, and this trend would have been even more clear-cut had Taiwan Province of China been included.

100. Relatively few developing countries, almost all of them in Asia and Latin America, have managed to join the exclusive club of industrial exporters. In 1990, manufactured exports accounted for at least one-fifth of export revenues in only seven of thirty sub-Saharan African countries (Central African Republic, Comoros, Gambia, Mauritius, Senegal, Sierra Leone and Zimbabwe). In Asia and the Pacific, the ratio of manufactured exports ranged from 36 per cent in Indonesia to 92 per cent in the Republic of Korea. Even more striking is the fact that the manufactured exports of 30 sub-Saharan countries in 1990 totalled $3.5 billion - less than 40 per cent of Indonesia's industrial exports and only 5 per cent of the figure for the Republic of Korea.

Outlook

101. In 1975, the UNIDO General Conference held at Lima set a target for the developing country share of global MVA of 25 per cent by the year 2000 - the Lima target. With the developing country share having reached 20.8 per cent by 1994, this target is likely to be surpassed and the latest projections suggest that the developing countries' share in world MVA will reach 30.6 per cent by the year 2005, while their share in global exports of manufactured goods increases from an estimated 24 per cent in 1995 to 29 per cent at the turn of the century and over 35 per cent by 2005.

102. UNIDO's baseline scenario is based on the assumption of moderate GDP growth of 2.6 per cent annually in the G-5 countries along with continued global economic reform and trade liberalization as well as low transport costs and moderate real interest rates. Under the baseline scenario, world GDP growth will accelerate from 2.1 per cent annually during the 1990-1995 period (Table 2.13) to 2.9 per cent a year between 1995 and 2000 rising to 3.2 per cent annually in the 2000 to 2005 period.

103. In the developing countries, growth will be maintained at 4.7 per cent a year over the five years to the year 2000 (compared with 4.8 per cent annually in the first five years of the 1990s), before accelerating to 5.4 per cent a year between 2000 and 2005. Once again, the pattern will be very uneven with growth of 7.5 per cent in East and South-East Asia, including China, but less than three per cent in Tropical Africa and Latin America. Strong regional growth in East and South-East Asia will raise its share of global GDP to 13.4 per cent by the year 2005 - just over half the total for the developing world of 27 per cent.

Table 2.13. Baseline scenario - GDP growth rates and percentage shares, 1990-2005

Region	1990-95	1995-2000	2000-2005
Developed countries	1.7	2.5	2.4
Eastern Europe and former USSR	-8.7	0.7	1.7
Developing countries (including China)	4.8	4.7	5.4
Latin America	3.1	2.5	2.9
Tropical Africa	1.3	2.2	2.4
North Africa/West Asia	3.0	2.8	3.0
Indian subcontinent	4.3	5.0	5.5
East and South-East Asia (including China)	8.1	7.2	7.9
World	2.1	2.9	3.2
Shares in global GDP	**1995**	**2000**	**2005**
Developed countries	76.0	74.2	71.6
Eastern Europe and former USSR	1.7	1.6	1.4
Developing countries (including China)	22.3	24.2	27.0
Latin America	5.0	4.8	4.8
Tropical Africa	0.7	0.7	0.7
North Africa and West Asia	5.5	5.5	5.4
Indian subcontinent	2.1	2.2	2.6
East and South-East Asia (including China)	8.8	10.8	13.4

Source: UNIDO Issue Paper, *State of world Industry and Scenarios for the Post-2000 Period* (ID/WG.542/3 (SPEC.)), Table A.1.

104. The industrialized countries' share of global MVA will continue to decline over the next decade reflecting the substantially faster growth of developing country industrial production of almost 7 per cent annually compared with just over 2 per cent in the developed economies. MVA growth will accelerate in all developing regions over the forecast period, but with East and South-East Asia continuing to grow faster than any other region. As a result, the latter's share in global MVA will rise to over 19 per cent

by the year 2005 from 11 per cent in 1995. The developing countries' share of world MVA will grow rapidly from 21.5 per cent in 1995 to 30.6 per cent by the year 2005, with almost all of this growth emanating from the high-performing Asian economies.

105. The scenario suggests that deindustrialization will be reversed over the decade with the share of MVA in global GDP rising marginally to 22.5 in the year 2005 from 22 per cent at present, reflecting a sharp increase in the developing countries where the share of MVA in GDP rises from 21.3 per cent at present to 25.5 per cent. Once again the trend is most marked in Asia but industry's share of GDP improves also in all other developing regions except Latin America. Eastern Europe's share in global MVA falls over the period from 2.3 per cent to 1.8 per cent and deindustrialization continues with the share of MVA in manufacturing declining from 29.5 per cent to 26.8 per cent in 2005 (Table 2.14).

Table 2.14. MVA growth rates and percentage shares, 1990-2005

Region	1990-95	1995-2000	2000-2005
Growth rates of MVA			
Developed countries	1.2	2.2	2.0
Eastern Europe	-12.6	-0.1	1.2
Developing countries	6.6	6.5	7.4
Latin America	2.8	2.2	2.6
Tropical Africa	1.3	3.4	3.7
North Africa and West Asia	4.6	6.1	6.2
Indian subcontinent	4.1	5.5	6.0
East and South-East Asia including China	10.5	8.9	9.6
World	1.7	3.1	3.4
Percentage shares in MVA	**1995**	**2000**	**2005**
Developed countries	76.2	72.7	67.6
Eastern Europe	2.3	2.0	1.8
Developing countries	21.5	25.3	30.6
Latin America	5.1	4.9	4.7
Tropical Africa	0.3	0.3	0.3
North Africa and West Asia	3.4	3.9	4.5
Indian subcontinent	1.4	1.6	1.8
East and South-East Asia	11.0	14.5	19.2
Percentage shares of MVA in GDP			
Developed countries	22.1	21.7	21.3
Eastern Europe	29.5	28.0	26.8
Developing countries	21.3	23.2	25.5
Latin America	22.6	22.3	22.0
Tropical Africa	9.7	10.2	10.9
North Africa and West Asia	13.5	15.8	18.5
Indian subcontinent	15.3	15.5	15.7
East and South-East Asia	27.5	29.6	32.0
World	22.0	22.2	22.5

Source: UNIDO Issue Paper, *State of World Industry and Scenarios for the Post-2000 Period* (ID/WG.542/3 (SPEC.)), Table A.2.

106. The baseline scenario points to strong growth of manufactured exports by developing countries whose market share rises from 24 per cent at present to over 35 per cent by 2005. Again, the vast bulk of the increase in market share reflects greater market penetration by the East Asian countries, including China. Their share rises from 17.8 per cent to 29 per cent over the period, at which stage they will account for over 80 per cent of developing world exports of manufactured goods. (Table 2.15)

Table 2.15. Baseline scenario: Manufactured exports, 1995, 2000 and 2005
(Percentage shares)

	1995	2000	2005
Developed countries	75.2	70.3	64.0
Developing countries	24.1	29.0	35.5
Latin America	2.8	2.6	2.5
Tropical Africa	0.3	0.3	0.3
North Africa and West Asia	1.6	1.8	1.9
Indian subcontinent	1.1	1.3	1.5
East and South-East Asia	17.8	22.7	29.0

Source: UNIDO Issue Paper, *State of World Industry and Scenarios for the Post-2000 Period* (ID/WG.542/3 (SPEC.)), Table A.2.

107. In a rapidly-changing, restructuring world economy such scenarios must be treated with caution, given the many imponderables surrounding future trends. In such an exercise it is simply impossible to take full account not just of such imponderables, but also of qualitative issues such as the impact of economic reform and restructuring throughout the world, and the medium-term effects of the Uruguay Round Agreements.

108. Structural change in manufacturing and between manufacturing and other sectors, most notably services, will accelerate in response to the pressures released by liberalization, deregulation and globalization. Industrialization patterns will also be affected by the legacy of past policies. In many countries, import-substitution-industrialization left a manufacturing sector populated by large, inefficient and overly diversified firms. Two different patterns of industrial development are envisaged as Governments in these post-ISI countries open up their economies to global competition.

- Those industries that cannot be sustained in the new liberalized environment will undergo wholesale restructuring In India, some economists believe that trade liberalization is undermining hi-tech activities, shifting production and exports to resource-based industries,[5] while in Brazil, firms manufacturing computers and peripherals have been forced t restructure, increasing their reliance on imports.

5. R. Nambiar and G. Tadas: "Is Trade De-Industrialising India?", *Economic and Political Weekly*, 15 October 1994.

- Liberalization and enhanced competition will force those firms that remain viable to abandon past diversification strategies, narrow their product range and focus on areas of core competence. This is likely to mean some vertical disintegration as firms are forced into increased specialization.

109. Macroeconomic stability must be maintained during the restructuring phase. Manufacturing has suffered in those Latin American countries that restored price stability with policies which resulted in real exchange rate appreciation, thereby undermining industrial competitiveness.

110. Appropriately sequenced trade liberalization, underpinned by policy support for industrial restructuring, will force firms to upgrade, freeing them from dependence on low-quality, high-cost domestic inputs, while encouraging management to invest in broadening and deepening its skills base. But liberalization and restructuring invariably have their downsides as productivity improvements lead to job losses. Accordingly, large-scale industry is unlikely to generate many new jobs in countries undergoing restructuring "for some time to come".

111. While countries like China and India, which are also restructuring, face job losses arising from productivity growth, they stand to gain enormously from the eventual phase-out of the Multi-Fibre Arrangement (MFA) in 2005. The huge success of the cotton textile industry in Tiruppur in south India underlines the potential for strong export-led growth in those Asian countries that are able to exploit improved market access in the developed-market economies.

South-East Asia

112. Restructuring is taking place between South-East and East Asia and other lagging regions as well as within the region itself. Rising real wages in the first wave of newly industrializing economies (NIEs) - Hong Kong, the Republic of Korea, Singapore and Taiwan Province of China - compounded by exchange rate appreciation, forced industrialists to seek low-labour cost locations elsewhere in the region (see Chapter 5). This not only opened up new opportunities for low-wage late-starters such as Malaysia, Indonesia, Thailand and Viet Nam, but also for crossborder vertical integration (Box 2.1).

113. The same process is likely to repeat itself as productivity and real wages rise in the second tier of NIEs (Malaysia, Thailand and Indonesia), and activity will shift to lower labour-cost locations such as China, Viet Nam and South Asia.

Box 2.1
Crossborder vertical integration in Asian industry

Manufacturing industry is becoming increasingly integrated across national borders as industrialists locate various activities from the production (value-added) chain in locations where the cost is lowest. The process is illustrated by the production of women's blouses in Asia, which encompasses three distinct stages of diminishing technological complexity—production of synthetic fibre, fabric manufacture and production of the blouses themselves.

- Between 1978 and 1987, the Republic of Korea emerged as an exporter of fibre alongside the leading Asian exporter, Japan.

- In the same period, China and the Republic of Korea became significant exporters of fabric as Japan's importance declined.

- The simplest part of the value-added chain, blouse manufacture, shifted from Hong Kong to China, Indonesia, Sri Lanka and Malaysia.

Source: UNIDO Background Paper, John Humphrey, *Industrialization in Developing Countries: The Challenges of Employment and Social Integration* (ID/WG.542/29(SPEC.)).

Sub-Saharan Africa

114. Unfortunately, there are, as yet, few signs of a similar process taking place in sub-Saharan Africa. Small, low-income populations make for tiny fragmented markets; the region has lagged behind the rest of the world in investing in human capital and physical infrastructure, and political instability is greater in Africa than elsewhere.

115. The region also suffers four other distinct disadvantages:

- It does not belong to any regional cluster and is therefore denied the spill-over effects that Asian countries, Latin America and southern, central and eastern Europe and the Mediterranean countries enjoy from Japan, the NIEs, the North American Free Trade Agreement (NAFTA) and the European Union respectively. Instead, sub-Saharan Africa suffers from a "contagion" effect - the knock-on effects of stagnant output and income throughout the region. It is conceivable, though by no means certain, that the emergence of the new South Africa will generate a positive cluster effect, especially in southern Africa, but South Africa itself is entering a period of intensive industrial, social and political restructuring that may inhibit its capacity to become an engine for regional economic growth.

- Much of African industry was developed in the 1960s and 1970s, during the ISI phase, behind high tariff walls and tight import controls. Import-substitution strategies have failed to provide the basis for structural diversification and self-sustained economic development. The structure of GDP has not changed significantly over the past decade and manufacturing still accounts for less than 10 per cent of GDP. The absence of domestic linkages and the persistence of dual economies is reflected in the large gap between the subsistence sector and the industrial enclave dependent on imported capital, equipment and skills. Large manufacturing enterprises were often established as public corporations under heavy protection against outside competition. Technology took the form of "turnkey factories with limited scope for employment creation and training".[6] Sub-Saharan Africa, including its more industrialized countries (Box 2.2), has entered a phase of wrenching restructuring, whose initial effects, as in Latin America, include some de-industrialization and a shift in export activity towards resource-based operations, especially energy and mining.

- Africa is the one region that, according to most assessments of the Uruguay Round, will not benefit from global trade liberalization. This is largely because it is less integrated with the global economy than any other region, and also because it will lose privileged access to OECD markets as African, Caribbean and Pacific (ACP) and Generalized System of Preference (GSP) margins are eroded (see Chapter 5).

- In the medium term, most sub-Saharan countries lack the technical, professional and managerial skills base - as well as the physical infrastructure - to exploit the benefits of globalization. Competition in the 1990s is human resource-intensive, whereas Africa's competitive advantage is largely confined to its rich physical resource base (minerals and metals, oil and gas and agricultural potential) and plentiful low-cost, but unskilled, labour.

116. Indeed, the region has failed to make progress even in labour-intensive industries. Very little footwear is exported from Africa, and the continent accounts for less than one per cent of global clothing and textile production. Only one country - Mauritius - is a significant exporter of clothing, and it will face tough new competition with the abolition of the MFA agreement early in the twenty-first century (Chapter 5). African countries have only a narrow window of opportunity to build a presence in this market before the MFA is finally abolished in 2005.

---

[6] UNIDO, *Participation of Women in Manufacturing*, Vienna, 1995.

Box 2.2
Restructuring South African industry

The one African country most likely to make the breakthrough to newly industrializing economy status in the near future is South Africa. Following the successful transition to majority rule in 1994, the new Government of National Unity launched an ambitious Reconstruction and Development Programme (RDP) designed to narrow income and wealth gaps between black and white and rich and poor, while generating the many thousands of jobs needed to solve the country's chronic unemployment crisis.

A recent report on industrial competitiveness, prepared by a United States-based consultancy group, Monitor, for the National Economic Development and Labour Council, identifies the major structural, policy and organizational changes needed if South African industry is to become competitive in global markets. Monitor found that in practically every South African industry, identical products are being manufactured "at substantially lower cost or higher quality" by firms in other countries.

Its report warns that the pressure to compete has become all the more urgent with the signing of the World Trade Organization (WTO) accord, and lists the five most important action points:

Create strong, coordinated industrial clusters. Such clusters are generally weak in South Africa, which lacks sophisticated suppliers of machinery, R&D capability, and strong training, design and consultancy services. The most developed cluster is in the sugar industry, where R&D, machinery and training institutions are strong.

- The country's export profile reflects the weakness of vital industrial and supporting functions. Competitive advantage is strongest in upstream (i.e. primary and basic processing) activities, followed by production for final consumption. Only 5 per cent of exports are from "industrial supporting" activities compared with 28 per cent in the Republic of Korea, and 12 per cent in Brazil and Taiwan Province of China. South Africa's industrial structure is closer to that of a developing-world economy than a newly industrializing Asian economy.

- South Africa has very few competitive machinery manufacturers (a fact that is reflected in its low level of machinery exports), while only in advertising, accounting and legal services is there strong industrial back-up.

continued

Box 2.2 (continued)

- Transport costs are high. Iscor, a globally competitive steel manufacturer, is a low-cost producer (with a production cost of $462 a ton against a world average of $505), but it costs $41/ton to move the steel to the ports and a further $31/ton to transport it to Europe.

- Data on South African industry and business are poor.

- Clusters must be coordinated. South African textiles and clothing industries should cooperate to compete globally rather than fighting amongst themselves.

Action: foreign direct investment should be targeted at addressing cluster weakness, with Government playing a coordinating role where necessary. Transport costs must be lowered.

Develop world-class strategic capability. South African industry is production-driven rather than marketing- or competition-oriented. Teamwork, just-in-time (JIT) manufacturing, total quality management (TQM) and activity-based costing are rarely used.

- Many firms ignore customer needs because they assume that only price and delivery dates, rather than quality and service, are important.

- Many companies are "stuck in the middle", having failed to make a clear-cut choice between low cost and high quality. The result is broad product lines and highly complex manufacturing systems. This complexity increases costs.

- South African business is vulnerable to competitors which focus on high-volume activities and undercut South Africans on cost and price, partly because technology and equipment is often outdated, while few firms are using modern industrial techniques.

Action: enhance management-training facilities at South African universities.

continued

Box 2.2 (continued)

Develop strong, integrated skills, machinery and work organization. In metal products, productivity is one-quarter to one-third of that in OECD economies. This is the result of obsolete equipment and poorly trained workers. For example, while labour costs per hour in vehicle assembly are low ($5.60 as against $6 in Mexico and $38 in the United States), labour hours per worker are more than double those in Mexico and the United States.

Action: install modern equipment, institute appropriate training programmes and encourage employees to work in teams.

Stimulate domestic competition and ensure high levels of inter-firm rivalry. Weak competition policy, high levels of protection, low levels of foreign investment, a dearth of small and medium-sized operators and high levels of State ownership have stunted competition.

- Low rivalry is the norm in many South African industries. Concentration in the construction industry, for instance, leads to higher costs.

- Even where there is intense competition this is often misdirected, as in clothing and textiles, where the two industries compete against each other rather than with foreign suppliers.

Action: policies recommended to enhance competition include privatization, fostering foreign investment, developing small/medium-scale businesses, sharpening up corporate disclosure and governance policies, reforming the Johannesburg Stock Exchange's listing requirements and using government purchasing policies to boost competition. Export subsidies should be abolished and protective tariffs lowered (although this is happening already).

Create a capable bureaucracy. Some government policies—such as the General Export Incentive Scheme (now being phased out), quotas, subsidies and tariff policy—are obstacles to increased competitiveness.

- In housing it takes two years to get permit approval, as against three months in Chile.

- Customers rate the effectiveness of government departments and non-government organizations as "very low".

Action: institute quick, low-cost policy administration.

continued

Box 2.2 (continued)

Policy recommendations

According to Monitor, the Government must frame its industrial strategy "with a far greater understanding" of how global competitive advantage is created in an industry. The consultancy group also advises that:

- Beneficiation is only appropriate in some - not all - industries.

- The regional market should be used to secure scale advantages.

- The country should focus on export markets—such as Latin America, the Middle East and South Asia - that welcome South African-style products. There is a danger in focusing too much on the EU and North American markets.

- Policy should be simple, stable and neutral across industries so as to avoid lobbying

- On the administrative side, policy needs be implemented quickly and at low cost.

It also warns of the difficult, and often painful, choices that the new Government will have to make, such as:

- State-of-the-art capital-intensive techniques versus rapid job-creation;

- Widespread consulting versus active decision-making. This is an area where President Mandela's consensual style of decision-making could have a high economic cost;

- A narrow, focused, product range versus serving all the requirements of the community;

- More jobs versus lower costs and consumer prices; and

- Increased industrial concentration and scale advantages versus greater rivalry and competition.

Source: Business Africa: Economist Intelligence Unit, May 1995.

CHAPTER 3. GLOBALIZATION AND INDUSTRIALIZATION

The borderless world

117. Since the mid-1970s, the fastest-growing countries have been those that have managed to industrialize by developing a competitive advantage in manufactured exports to the point where industrial exports have become the engine of growth. This pattern of growth, characterized by a growing share of manufacturing value-added (MVA) in GDP and a rising ratio of exports - and specifically exports of manufactures - to GDP, marked the first phase of globalization of developing countries. The process has since broadened to include the fast-expanding role of industrial groups and firms from several developing countries that have achieved rapid growth of production and exports. The process has led to increased flows of inward foreign direct investment (FDI), the proliferation of joint ventures and increasing sophistication of non-equity technology and marketing links between transnational corporations (TNCs) from industrialized economies and affiliated or unrelated firms in developing countries, the expansion of portfolio investment flows, and the integration of production, distribution, R&D and other corporate activities across national borders. Globalization refers also to the increasing mobility of ideas, information flows and consumer tastes.

118. Globalization is the corporate business response to the changed and changing international business environment. The process has its roots in four key developments, the first two of which are arguably the most important:

- Policy changes in the world economy, specifically the liberalization of trade and capital flows, the deregulation of markets, and privatization, which has opened up new investment opportunities in most countries;

- Accelerating technological progress that has changed the rules of the game for both TNCs and for host developing countries and enterprises in these countries;

- New organizational structures within companies, in part made feasible by technological advances in the information and communications industries; and

- The shift of economic power from the north and west to the developing countries, especially in Asia - a result, as much as a cause, of globalization.

119. The liberalization of most economies in the developing world has radically changed the rules of the game for Governments as well as corporations. Ironically, by facilitating globalization, policy changes have contributed to a significantly reduced role for Governments. As business globalizes, international business operations become increasingly more important as compared to the role of Governments, including those of developing countries.

120. The growing role of TNCs is also underscored by estimates that TNCs control at least one-third of the world's private-sector capital stock, while between 33 per cent and 50 per cent of world trade is conducted between TNC affiliates on an intra-firm basis.[1]

121. At the same time, national economic and social policies are also being increasingly circumscribed by the role and activities of international organizations such as the International Monetary Fund and the World Bank and in the future, by the World Trade Organization with respect to global trade.

Table 3.1. Trends in world trade integration, 1971-1996

Indicator/region	1971-85	1986-90	1991-93	1994-96
World trade growth[a/]	3.7	6.1	3.9	7.7
World output growth	3.2	3.3	1.1	3.0
Speed of integration[b/]	0.5	2.8	2.9	4.7
High-income OECD countries	0.3	3.2	0.8	4.2
Developing countries	-0.6	0.6	6.7	5.0
Sub-Saharan Africa	-1.5	-0.7	0.4	1.4
East Asia	1.0	1.4	5.8	5.1
South Asia	-0.4	-0.2	4.1	3.2
Europe and Central Asia	0.0	-2.1	7.3	8.3
Middle East and North Africa	-1.5	3.1	0.3	0.9
Latin America and Caribbean	-1.6	2.0	9.6	2.8

Source: World Bank, *Global Economic Prospects and the Developing Countries*, 1995.

a/ Growth rate of the sum of merchandise export and import volumes.
b/ Growth rate of trade minus growth rate of output

Globalization — an opportunity as well as a threat

122. The globalization process itself is both an opportunity and a threat for developing countries, since it opens the way for small, low-income countries to industrialize in a manner that was not possible when inward industrialization policies were in vogue in the 1960s and 1970s. At the same time, it is clear from the correlation between export expansion, inflows of foreign investment, and industrial and economic growth that countries that have been unable to integrate - sub-Saharan African countries being the most prominent example - are being left behind.

123. Globalization implies that trade expands faster than output; while industrial investments, particularly FDI grows even more rapidly than trade.

1. UNIDO Background Paper, Nagesh Kumar, *Foreign Direct Investment, Technology Transfer and Exports of Developing Countries* (ID/WG.542/6 (SPEC.)).

124. Table 3.1 shows how the pace of integration (defined as the growth rate of foreign trade minus the growth rate of GDP) has accelerated internationally since the mid-1980s, with the Asian and Latin American regions participating in the process far more vigorously than sub-Saharan Africa or, to a lesser extent, North Africa and the Middle East.

Table 3.2. FDI inflows (net) as a percentage of exports, 1980-1994, selected years

Years	1980	1987	1990	1992	1994
All developing countries	0.7	2.1	2.8	4.6	6.7
East Asia and Pacific	1.3	2.7	4.4	6.4	10.2
South Asia	0.8	1.3	1.4	1.4	1.4
Latin America and the Caribbean	4.8	4.6	4.4	7.0	8.5
Middle East/North Africa	-1.5	1.0	1.0	1.1	1.5
Sub-Saharan Africa	0.0	2.2	1.0	2.2	2.7
Eastern Europe and Central Asia	0.0	0.0	0.2	3.1	7.4

Source: World Bank, *World Debt Tables, 1994/95.*

125. Table 3.2 illustrates the growth of FDI relative to exports in developing countries; this aspect of globalization has also progressed more rapidly in East and South-East Asia, Latin America and, most recently, eastern Europe, while the other regions lag behind. Greater openness - the relaxation of restrictions covering FDI, trade liberalization and payments reform, the abolition of quantitative import restrictions, and the reduction and harmonization of tariffs - was a precondition for this process.

126. The main forces driving globalization are broadly similar to those underpinning international trade growth. Firms adopt new and different strategies designed to maximize profits within the context of a changed international economic environment. The principal elements which dominate the process are international trade; industrial investments, particularly FDI, and international inter-firm cooperation, including non-equity cooperation (NEC) such as strategic alliances, licensing, franchising and subcontracting arrangements.

127. Hitherto, the process has been dominated by corporations from OECD countries, with increasingly active participation by dynamic industrial enterprises and groups from East and South-East Asian economies, including China, and some Latin American countries. In all probability, India and South Africa will also become part of this process in the near future.[2/]

2/ UNIDO Background Paper, Peter Gundlach and Erich Nunnenkamp, *Globalization of Manufacturing Activity: Evidence and Implications for Industrialization in Developing Countries* (ID/WG.542/13 (SPEC.)).

128. Developing countries that have successfully participated in the globalization process share two common characteristics:

- A policy environment conducive to mobilization of industrial investments, particularly FDI; and
- A plentiful supply of educated workers capable of competing with low- and medium-skilled labour in industrialized economies.

The corporate response

129. The corporate response to the new policy environment of the 1990s depends on:

- Industry-specific considerations, notably cost structures, market drivers, government policies and the competitive environment.

- Global strategy levers - the different ways in which corporate strategies can be globalized Strategy levers include the participation policy of firms in global operations in different markets, their product strategy, where and how they locate different operations, and the way in which they respond to competitive moves by rival corporations.

- The capacity of an enterprise to implement such strategies, which will in turn depend on its tangible and intangible resources, including financial and human resources, control over technologies and brand-names.

- The firm's assessment of the benefits and costs of globalization, which will depend substantially on organizational considerations that are crucial to the successful exploitation of global strategies.

130. The ability of foreign investors to locate an increased proportion of their value-adding activities in developing countries and the capacity of enterprises in developing countries to absorb such inflow and to participate in export-oriented manufacture constitute key elements in the globalization process for developing countries. The process is driven by the rapid advance of information technology, the growing trend towards the convergence of demand patterns (the globalization of markets) and intensified competition in international markets. In the past 15 years, the process of crossborder integration has become increasingly sophisticated and complex.

- In the simplest strategies, stand-alone affiliates or multi-domestic subsidiaries of TNCs serve national markets, operating with a high degree of autonomy from the parent company and undertaking most value-added activities within the country concerned;

- As trade and capital flows are liberalized, international communications improve, scale economies increase and global competition intensifies, so new patterns of integration have evolved, implying increased globalization;

- Simple integration involves outsourcing of production, either by locating manufacturing or assembly activities offshore (foreign direct investment) or by subcontracting operations to foreign suppliers or participation in joint ventures, licensing, franchising and other contractual arrangements involving production and operation in developing countries;

- Complex integration goes beyond outsourcing and manufacture in other countries to locate value chain activities in those markets where the benefit-cost ratio is greatest. Thus data-processing accounting, finance or R&D activities may be located in one or other developing country.

Foreign direct investment

131. FDI has become the single most important component of private external resource flows to developing countries, accounting for 40 per cent of private transfers in 1993. Inward investment in developing countries has increased dramatically in the 1990s, reaching 39 per cent of global FDI inflows in 1993; the value of such flows is estimated to have increased from $71 billion in 1993 to $80 billion in 1994.

132. East and South-East Asia's share of the developing world's stock of inward investment more than doubled in the five years to 1993, reaching 49.2 per cent and accounting for in excess of 60 per cent of such inflows during the 1991-93 period. Table 3.3 shows that the region's share of global inward FDI doubled between the early 1980s and 1991-1993, reaching 25.7 per cent in 1993/94.

133. The region's share of FDI inflows is distorted by China's dominance - with an inflow of $27.5 billion in 1993 and over $30 billion in 1994, China became the single largest recipient of global investment (see Table 3.4). A second notable feature is the strong growth in ASEAN inflows, relative to those attracted by the newly industrializing economies (NIEs) of Hong Kong, the Republic of Korea, Singapore and Taiwan Province of China.

134. Disparities in FDI flows extend to countries as well as regions. Over the past decade, the ten largest host developing countries have consistently attracted between two thirds and four fifths of developing country inward investment. The highly uneven nature of FDI flows is illustrated in Table 3.5, which shows that the composition of the ten largest developing host nation economies is largely similar to the pattern of inward stocks. The two main exceptions are Brazil and Saudi Arabia, whose large stocks of inward FDI were accumulated in earlier years. Neither country features as a major recipient in 1993.

Table 3.3. FDI inflows and stock in developing countries 1981-1993

Region	Annual average inflow 1981-85	1986-90	1991-93	Inflow 1993	Inflow 1994[a]	Stock 1993
Developing countries[b]						
Value ($billion)	13.1	25.3	54.1	70.8	79.7	494.0
Share of the world total (%)	25.9	16.0	32.3	38.6	39.0	23.1
Africa						
Value ($billion)	1.7	2.8	3.1	3.2	3.8	48.3
Share of the world total (%)	3.4	1.8	1.9	1.8	1.8	2.3
Share of developing-country total (%)	12.9	11.2	5.7	4.6	4.7	9.8
Latin America and the Caribbean						
Value ($billion)	5.9	8.0	17.1	19.5	22.1	167.6
Share of the world total (%)	11.6	5.1	10.2	10.6	10.8	7.9
Share of developing-country total (%)	44.7	31.7	31.6	27.5	27.7	34.1
West Asia						
Value ($billion)	0.4	0.4	0.7	0.5	0.7	29.4
Share of the world total (%)	0.9	0.3	0.4	0.3	0.4	1.4
Share of developing-country total (%)	3.4	1.7	1.3	0.8	0.9	6.0
East, South and South-East Asia						
Value ($billion)	4.9	13.8	32.9	47.2	52.4	245.0
Share of the world total (%)	9.8	8.7	19.6	25.7	25.7	11.4
Share of developing-country total (%)	37.6	54.4	60.7	66.7	65.7	49.2
The Pacific						
Value ($billion)	0.1	0.2	0.1	0.2	0.6	2.4
Share of the world total (%)	0.3	0.1	0.1	0.1	0.3	0.1
Share of developing-country total (%)	1.1	0.7	0.3	0.3	0.7	0.5
Memorandum:						
Least developed countries (LDCs)						
Value ($billion)	0.2	0.6	0.4	0.5	0.6	8.1
Share of the world total (%)	0.4	0.4	0.3	0.3	0.3	0.4
Share of developing-country total (%)	1.4	2.3	0.8	0.7	0.7	1.6
Developing countries excluding China						
Value ($billion)	12.3	22.4	39.8	43.3	49.7	433.6
Share of the world total (%)	24.3	14.2	23.8	23.6	24.4	20.4
Share of developing-country total (%)	93.9	88.5	73.6	61.2	62.4	88.3

Source: UNCTAD.

a/ Estimate.

b/ Includes industrially less developed countries in Europe (Gibraltar, Malta and the former Yugoslavia).

Table 3.4. FDI inflows to Asia and the Pacific, 1981-1993
Annual average, $ million

Region/country	1981-85	1986-90	1991-93	1991	1992	1993
All East, South and South-East Asian economies	4,930	13,758	32,865	20,739	30,656	47,198
China	850	2,853	14,346	4,366	11,156	27,515
East, South and South-East Asian economies excluding China	4,080	10,905	18,519	16,373	19,500	19,684
Newly industrializing economies	2,231	6,940	9,317	7,813	10,210	9,929
Hong Kong[a/]	576	1,945	1,419	538	2,051	1,667
Korea, Republic of	117	676	727	1,116	550	516
Singapore	1,349	3,333	6,149	4,888	6,730	6,830
Taiwan Province of China	189	987	1,022	1,271	879	917
ASEAN[b/]	1,661	3,405	8,487	8,039	8,590	8,832
Indonesia	236	599	1,754	1,482	1,777	2,004
Malaysia	1,083	1,126	4,237	3,999	4,469	4,351
Philippines	63	493	512	544	228	763
Thailand	279	1,188	1,948	2,014	2,116	1,715
Other countries	189	559	714	522	699	922
of which:						
Afghanistan[a/]	0.1	0.1	-	-0.3	0.4	-
Bangladesh	-	2.2	6.4	1.4	3.7	14
Cambodia	-	-	23	-	33	37
India[a/]	59	182	188	145	147	273
Lao People's Democratic Republic	0.3	2.4	21.7	8	9	48
Myanmar[a/]						
Nepal[a/]	0.1	1.9	0.7	2.2	-	-
Pakistan	77	175	313	257	335	347
Sri Lanka	42	40	122	48	123	195
Viet Nam[a/]	6.2	5.6	12	32	0.1	3.7
The Pacific	139	184	150	138	121	190
West Asia	445	432	696	504	1,038	547
Total	5,514	14,373	33,710	21,382	31,814	47,936

Source: UNCTAD.

a/ FDI from Development Assistance Committee member countries only.
b/ Singapore is included among the newly industrializing economies and Brunei Darussalam in the total for "other countries".

Table 3.5. The ten largest host developing economies, FDI flows and stock, 1993
($ million)

Host economy	Flows	Host economy	Stocks
All developing economies	70,812		494,418
Total ten largest developing host economies	57,105		336,996
Percentage share of ten largest developing host economies in total inflows to developing economies	81	Percentage share of ten largest host economies in total inward stock of developing economies	68
China	27,515	China	57,172
Singapore	6,830	Singapore	50,805
Argentina	6,305	Indonesia	44,146
Mexico	4,901	Mexico	41,912
Malaysia	4,351	Brazil	40,371
Indonesia	2,004	Malaysia	26,936
Thailand	1,715	Saudi Arabia	22,463
Hong Kong	1,667	Argentina	21,701
Taiwan Province of China	917	Hong Kong	17,669
Nigeria	900[a]	Thailand	13,824
Memorandum:			
Percentage share of the nine largest host economies, excluding China	42		57

Source: UNCTAD.

a/ Estimated.

FDI flows to the countries in transition are growing

135. Investment inflows to the countries in transition in central and eastern Europe increased 22 per cent in 1993 to $6 billion, taking the region's stock of inward FDI to $14 billion. In 1991/92 FDI inflows to the region averaged over 7 per cent of gross domestic capital formation, significantly higher than the 4.5 per cent for developing countries as a whole. By the end of 1993, TNCs had established some 50,000 affiliate companies in the countries in transition with the Czech Republic, Hungary and Poland accounting being the main destinations. However, although the region's stock of FDI grew from less than $1 billion in 1990 to $14 billion in 1993, it remains tiny at less than 1 per cent of the global total and 2.8 per cent of the developing world's stock of $494 billion.[3/] Indeed, in 1992, China and Mexico each had FDI inflows that were well above those reported by the transition economies as a whole.[4/]

3/ UNCTAD: *Recent Developments in International Investment and Transnational Corporations*, Geneva, February 1995.

4/ H. Muegge and G. Assaf, *UNIDO and the Economies in Transition: The Challenge of Economic Recovery and Technical Assistance*. MOCT-MOST 5, 1995, page 237.

136. After five years of transition, the volume of FDI flows to these countries has not only been very unevenly distributed across countries, but it has also been "much lower than expected".

Government policy and FDI

137. Table 3.5 underscores the extent to which the explosion of FDI flows has benefited only a tiny handful of the more advanced developing countries, despite government efforts in most developing countries to liberalize investment regimes so as to attract increased capital inflows. The direction of FDI flows is determined more by the growth potential and level of prosperity of host economies than by government policies and incentives.[5/]

138. While the role of liberalization, deregulation and privatization in attracting FDI should not be underestimated, a 1992 study covering 42 countries during the 1982-88 period emphasizes the importance of the quality of infrastructure, market size and level of industrialization in attracting FDI by TNCs based in the United States.[6/] By contrast, incentives such as tax breaks were found to have little impact on inward investment.

139. An analysis of export-oriented FDI by American TNCs in 1982, identifies the major determinants of inflows as:

- A pool of low-cost labour;
- The existence of established industrial infrastructure and capability;
- The availability of natural resources; and
- Export-processing zones.

140. "The overall international orientation of the host economy or other aspects of government policy such as incentives and performance requirements do not appear to influence significantly the location of export-oriented production".[7/] In the last decade, however, labour quality, rather than low-cost labour, has become the major determinant of inward investment. For foreign investors, the local availability of highly qualified personnel is of crucial importance, without whom there is little justification for locating an industrial operation.

141. However, selective policies, such as those in export-intensive and high-tech activities, may improve the quality of FDI inflows. At present, the distribution of such flows is extremely uneven across countries. Developing countries able to negotiate preferential access to major trading blocs - i.e. east European and Mediterranean

---

5/ UNIDO Background Paper, Nagesh Kumar, *Foreign Direct Investment, Technology Transfer and Exports of Developing Countries: Trends and Policy Implications* (ID.WG.542/6 (SPEC.)).

6/ *Ibid.*

7/ *Ibid.*

countries with the EU, and Mexico with Canada and the United States - enjoy a substantial advantage over other regions.

142. Similarly, by creating a critical mass in terms of market size while enhancing growth potential, regional economic integration among poorer countries could also become an increasingly important determinant of FDI and other capital inflows. Unfortunately, however, past experience suggests that such regional groupings give rise to the polarization of investment and industrialization, resulting in inequitable patterns of growth within the regional groups.

143. Technology import policy needs to strike a "delicate balance" between discouraging domestic R&D investment and fostering a false sense of complacency. While a "too liberal" policy towards technology imports under licensing and FDI may discourage local technological effort, a restrictive, regulatory policy may make local enterprises complacent about the need for constant upgrading.

Joint ventures and non-equity linkages

144. While the data on joint ventures and non-equity cooperation (NEC) are limited, it is clear that this has become a fast-growing channel for global cooperation and technology transfer, though to date, the bulk of this has taken the form of linkages between enterprises in developed economies. One study finds that over 95 per cent of "strategic" technology alliances, where R&D considerations are uppermost, are between enterprises in industrialized countries, while such arrangements comprise just 1.5 per cent between developed-country and developing-country enterprises.[8/]

145. Similarly, about 90 per cent of technology-transfer agreements and 85-90 per cent of payments for technology are estimated to be between firms in industrialized economies, though substantial technology transfer has occurred between these corporations and their partners in several developing countries, particularly in Asian and Latin American economies, especially in the automotive, capital goods, and consumer electronics subsectors. However, such transfers primarily relate to technology and know-how and are generally much less R&D-intensive than strategic alliances. Inter-firm technology transfers of this kind between partners at different stages of technological development may well be a preferred alternative to FDI because they broaden the opportunities for indigenous technological deepening that might not otherwise occur.

146. There has been considerable growth of technology licensing in a number of developing countries. In countries such as Brazil and India, technology agreements between local companies and foreign enterprises have exceeded one thousand in number annually. In several other countries such as Kenya, Mauritius, Nigeria and Zimbabwe, technology and know-how agreements have become increasingly popular and are emerging as a substitute for FDI, particularly in the case of enterprises that have

---

8/ UNIDO Background Paper, Gundlach and Nunnenkamp, *op. cit.*

financial strength and technological capability and are keen to retain autonomy and control.

Portfolio investment

147. Arguably, portfolio flows constitute the least important element of globalization. In 1994, they accounted for 13.4 per cent of total developing-country capital inflows, compared with 35.3 per cent for FDI and 35 per cent for debt. The balance, also of 13.4 per cent, represented aid grants. The significance of portfolio flows varies regionally from as little as 3.7 per cent in sub-Saharan Africa, Eastern Europe and Central Asia to 41 per cent in South Asia, 21 per cent in Latin America and 19.5 per cent in East Asia.

148. Portfolio flows contribute to the development process in six main ways:

- They bolster a country's external payments position and help finance imports;
- They make an important contribution to domestic capital-market development and constitute a possible source of funding for industrial development;
- They lower the cost of capital and widen the financing choices available to companies;
- They play a vital role in the privatization process whether indirectly, by fostering the development of capital markets, or directly, by financing private-sector buy-outs of State enterprises;
- They may be the forerunner of FDI; and
- They raise a country's economic profile and that of its leading stock exchange-listed corporations.

An era of unprecedented opportunity

149. The era of globalization is described as "one of unprecedented opportunity" for developing countries, while their successful industrialization is one of the major reasons for globalization. For developing countries, globalization comprises both the participation of local enterprises in international production of goods and services and increased exports of goods and services by domestic export-oriented firms to global markets.

150. Prospects of developing-country firms becoming involved in the international division of labour vary with the different modes of globalization. For example, their participation in crossborder technology research is weak, although the availability in India and the countries in transition of large numbers of well-qualified scientists and technologists — at salaries far lower than those prevailing in OECD countries - will mean that a growing proportion of R&D activities can be advantageously located in such

regions. So far, however, this has mainly been as a result of separate agreements between foreign firms and developing-country companies and institutions.

151. Developing countries have, however, been linked to the technology transfer process, both through FDI and through joint ventures and non-equity technology transfer arrangements. The surge in the share of global inward FDI targeting the developing countries - $80 billion in 1994 (or 40 per cent of global FDI) compared with $13 billion (or 25 per cent of the global total) in the first half of the 1980s - underlines the extent to which FDI and related technology transfer has taken place to some developing countries, mainly in East and South-East Asia and, to a lesser extent, Latin America, as part of the globalization process. The number of technology agreements with developing-country enterprises has also increased very significantly, together with payments of fees and royalties for technology and know-how.

152. Even low-income developing countries have managed to join in the process of globalization, especially in subsectors such as clothing and textiles, but also by integrating with the world economy as subcontractors and through other forms of non-equity involvement. The more advanced developing countries are losing competitive advantage in this highly labour-intensive segment. Rising real wages have eroded their cost advantages, while quotas imposed by industrialized countries limited their market access, forcing them to relocate some of their labour-intensive operations in low-wage economies, while simultaneously upgrading towards more capital- and skill-intensive activities, including production of machinery and transport equipment. FDI and technology transfer arrangements have played an important role in propelling developing-country players into these markets. High growth projections for Asian markets, in particular, are likely to encourage further FDI and non-equity links in these and other industrial subsectors where production has increased considerably in several developing countries. Higher technological and skill requirements have limited developing countries' integration into the automobile industry, but the region's share in the manufacture of both finished products and of auto parts has risen strongly. FDI was the driving force behind this process in Latin America, while, in Asia, non-equity links have played a central role.

Table 3.6. Japanese FDI in the Far Eastern cluster 1980-1993

Country	1980		1985		1993	
	Value $ million	Percentage share	Value $ million	Percentage share	Value $ million	Percentage share
Thailand	285	29	558	28	4,539	33
Taiwan Province of China	505	19	1,182	23	5,056	29
Republic of Korea	1,206	65	1,902	52	4,466	40
Hong Kong	-	-	308	21	1,171	33
Indonesia	3,462	38	4,951	30	13,937	21
Subtotal	5,458	37	8,901	31	29,169	26

Source: UNCTAD, *Recent Developments in International Investment and Transnational Corporations*, February 1995.

153. As a second, and even a third, tier of newly industrializing countries is drawn into the globalization process, the widely held opinion that only a handful of developing countries will benefit from the process is no longer sustainable. "Instead, the chances of newcomers have been further improved as advanced developing countries themselves become sources of outward FDI, primarily in regional clusters and most notably in Asia". (see Box 3.1). As per capita incomes and wages rise and labour markets tighten, so these developing countries are shifting towards higher value-added activities while relocating labour-intensive operations in lower-income economies.

Box 3.1
Intra-regional FDI and clusters in Asia

Asia and the Pacific is the most important focus for FDI by TNCs, with the location of nearly half the capital stock of the developing world. Indeed, the region's FDI stock doubled between 1988 and 1993, with flows averaging almost $50 billion a year in 1993/94; 58 per cent of this total went to one country, China.

Initially, the Asian cluster of industrializing countries was driven by Japanese FDI. Figures for five main regional locations (excluding China) show Japan's FDI stock growing from $5.5 billion in 1980 to more than $29 billion by 1993 (see Table 3.6). Although its share rose in Thailand, Taiwan Province of China and Hong Kong, Japan's regional share declined from 38 per cent in 1980 to 21 per cent by 1993. Over the same period, the proportion of its outward stock invested in Asia halved from 24 per cent to 11.7 per cent as Japanese TNCs switched the focus of their offshore investments, setting up transplant operations in North America and the European Union.

The growth of intra-regional Asian investment from $10.4 billion in 1980 to $132 billion in 1993 was a second factor. Table 3.7 shows the evolution of the newly industrializing economies as major sources of outward FDI, with their share of intra-regional investment increasing one-quarter to 43 per cent over the period. More than 70 per cent of this was in China ($127 billion by 1993), while a further $31.4 billion was in ASEAN countries.

The share of nine Asian economies (the eight listed in Table 3.7 plus Singapore) in the total inward stock of the same nine countries increased from 30 per cent in 1980 to 45 per cent in 1993. Half ($1.8 billion) of the Republic of Korea's outward FDI in 1993 and 41 per cent ($1.6 billion) in the first half of 1994 was destined for other Asian locations, especially China, Indonesia and Viet Nam. Similarly, more than one third ($2 billion) of outward FDI from Taiwan Province of China went to the ASEAN economies in 1992. As a result, regional Asian TNCs have become serious competitors with their OECD counterparts, not just in Asia but all over the world, including OECD domestic markets.

Table 3.7. Intra-regional FDI stock in selected Asian countries, 1980 and 1993
(Percentage)

	NICs		ASEAN		China		Total	
	1980	1993	1980	1993	1980	1990	1980	1993
Host country								
Hong Kong	2.9	1.8	3.2	0.2	-	11.1	6.1	13.1
Republic of Korea	3.6	3.7	-	-	-	0.1	3.6	3.8
Taiwan Province of China	21.5	15.6	8.6	4.5	-	-	30.2	20.1
Subtotal	7.4	5.6	3.0	1.4	-	0.9	10.3	8.0
ASEAN								
Indonesia	11.6	25.5	0.7	0.4	-	1.0	12.3	26.9
Malaysia	36.3	31.8	0.4	4.6	-	0.7	36.3	37.0
Philippines	5.5	19.2	-	0.7	-	-	5.5	19.9
Thailand	18.5	31.6	1.7	0.6	-	0.2	20.2	32.4
Subtotal	20.1	27.7	0.5	1.6	-	0.3	20.6	29.5
China	52.5	76.7	0.4	1.0	-	-	53.0	77.0
Total	25.7	43.1	1.1	1.3	-	0.3	26.8	44.7
Value, $ billion	10.0	127.3	0.4	3.8	-	0.85	10.4	132.0

Source: UNCTAD, *Recent Developments in International Investment and Transnational Corporations*, February 1995.

Threats posed by globalization

154. In an increasingly borderless world, where competitiveness is driven by liberalization and technological progress, developing countries face serious threats as well as potential opportunities. These include:

- Decline in MVA as a proportion of GDP, arising because domestic industry is unable to compete either with foreign imports or in export markets;

- Rapidly rising wages, even under labour surplus conditions, thereby forcing management to move up the technology ladder in search of increased productivity to justify new investment and retain competitiveness;

- Declining employment in manufacturing industry as new generic technologies substitute capital for labour, despite the comparative advantage of plentiful labour supplies;

- A shift towards greater dependence on primary production and some services (tourism) caused either by the loss of comparative advantage in manufacturing due to inadequate technological upgrading - or the closure of import-substitution industries unable to compete under open-economy conditions. This is the so-called "locked in" pattern of trade and development, whereby countries exploit experience effects, becoming relatively more productive in those activities in which they are already specialized. There is evidence to sustain this theory in some African and Latin American countries, where the relative efficiency of

resource-based industries is reinforced by the competitive discipline imposed in export markets.[9]

155. It has been suggested that countries locked into low technology and low productivity growth operations could consider Japanese/Korean-style selective protection to build comparative advantages in new and different industries. Their Governments could adopt a policy of "narrow moving band" protection whereby temporary protection is extended to goods just outside the present pattern of national comparative advantage. Protection is then removed once productivity has increased to the point where the product becomes globally competitive.

Prerequisites

156. There are various preconditions for successful integration with the global economy:

(a) Domestic policy reform to open the economy is the key to participation in the globalization process. Increased openness has several dimensions:

(i) There must be accelerated growth of domestic enterprises, which must become increasingly export-oriented, including through non-equity technological and market linkages with foreign companies;

(ii) FDI regimes must be liberalized to utilize foreign capital as an engine of growth and structural change;

(iii) Policy disincentives and regulations that deter the transfer of foreign technology through licensing and other non-equity links should be lifted. Specific policy measures to facilitate technology transfer are essential to avoid the development of an "imitation" syndrome at corporate and national levels;

(iv) Import liberalization should be used to eliminate any anti-export bias in developing-country trading regimes, as export subsidies will have to be phased out under the Uruguay Round Agreements. This will make export industries more attractive and may enhance the inflow of FDI/non-equity forms of cooperation;

(b) Evidence and experience show that macroeconomic instability is a major obstacle to FDI and other forms of globalization. Governments would need to develop an enabling environment, including relative price stability, fiscal discipline and competitive tax rates. The contrasting experiences of Brazil and Mexico in the motor vehicle industry suggest that globalization is more likely to pay dividends where appropriate domestic policies are in place;

(c) Given the crucial role of domestic investment both for initial start-ups and upgrading and enhancing human as well as physical capital, domestic-resource-

---

9/ UNIDO Background Paper, Charles Cooper, *Technology, Manufactured Exports and Competitiveness*, (ID/WG.542/5 (SPEC.)).

mobilization and development of local entrepreneurship constitute essential prerequisites, especially in developing countries that are heavily dependent on aid inflows;

(d) Investment in human capital is at least as important as physical capital accumulation - the more so under conditions of globalization, which accelerates technology transfer. Technology transfer cannot, however, proceed effectively without a strong human capital base in the recipient country;

(e) Regionalization - the development of free-trade areas or customs unions - may facilitate globalization. Preferential trade arrangements and access to foreign capital under agreements with the EU and the cluster effects enjoyed by Mexico in terms of NAFTA contribute to faster, export-led development.

157. At the same time the contrasting experiences of the Asian developing countries and the African, Caribbean and Pacific (ACP) group of States under the Lomé conventions show that membership of an economic union is neither a necessary nor a sufficient condition for economic progress. The Asian developing countries have utilized globalization most effectively without participating in any regional integration arrangement with advanced industrialized countries. By contrast, globalization has bypassed many, indeed most, ACP States despite their preferential access to EU markets. Regional integration is no substitute for outward orientation and appropriate domestic policies. "Openness and a sufficient provision of public goods must figure high on the policy agenda".[10/]

Policy implications

158. As globalization proceeds, so the dividing lines between its different vehicles become increasingly blurred. This is most apparent in the substitution of non-equity links, particularly technology licensing agreements and strategic alliances, for more traditional forms of FDI. Until the early 1980s, many Governments, concerned that foreign domination of their economies would both undermine their autonomy and crowd out indigenous enterprise, used wide-ranging regulations to regulate FDI and the globalization process, insisting on local participation in ownership, or local content. Such policies encouraged TNCs to globalize using non-equity forms of cooperation, although not without two major drawbacks:

- TNCs, fearing dilution of proprietary technologies, patents and brand-names, were reluctant to transfer state-of-the-art technologies and products, or brand-names, to their non-equity partners in developing countries.

- Such restrictions favoured simple rather than complex integration strategies, limiting the potential benefits to the developing countries concerned to low-technology, labour-intensive "screwdriver" industries rather than those with access to higher-technology applications.

10/ UNIDO Background Paper, Gundlach and Nunnenkamp, *op. cit.*

159. The "fragmentary and incomplete" nature of the statistical data available in respect of non-equity links needs to be emphasized. "The flow of goods, services and income, induced by such arrangements is typically hard to identify". Not only that, but FDI and NEC are "sometimes difficult to disentangle".

160. While developing countries may prefer FDI in some industries and non-equity linkages in others, the suitability of different globalization strategies will depend on a host of considerations over and above government policy, which is just one of several determinants driving the market entry decision of international business. The combination of the proliferation of globalization techniques and the liberalization of government policies often highlights the increasingly reduced role of Government in influencing such decisions.

161. In a world in which competition to attract foreign capital - in whatever form - is increasingly intense, policies to promote one type of inflow (NEC) relative to another (FDI) may be counterproductive. It is primarily for corporations to decide whether and how they wish to penetrate a particular market. Policies to curb FDI and encourage non-equity links or portfolio inflows may deter investment altogether, resulting in increased imports of finished products.

162. East Asian experience suggests that strategic alliances between TNCs from industrialized, developed countries and developing-country partners are more likely to be established by larger, more capital-intensive firms in developing economies. The evidence also suggests that relatively advanced developing countries have a better chance of participating in business alliances. In other words, "the division of labour between unequal partners is more likely to proceed through other instruments than non-equity cooperation". Strategic alliances between TNCs and developing-country firms are more important where production is standardized, and especially in the field of market-oriented cooperation. Technology transfer to developing countries, however, takes place both through FDI and through joint ventures and various forms of non-equity linkages and contractual arrangements.

Box 3.2
Three case studies

Clothing and textiles

Although FDI has played a minor role in globalizing the sector, world exports of clothing and textiles surpassed the growth rate of world trade so that their share in global exports rose to 7.1 per cent in 1992 from 4.8 per cent in 1980. Much of this represented increased output by developing countries, whose share of worldwide production in both industries rose eight percentage points to 35 per cent for textiles and 24.6 per cent for clothing between 1984 and 1993. Although many developing countries participated, the main thrust came from Asia, which today accounts for more than 70 per cent of developing countries' production.

continued

Box 3.2 (continued)

Clothing production grew strongly in sub-Saharan Africa, albeit from a tiny base, expanding 6.3 per cent between 1984 and 1993 compared with 4.4 per cent for developing countries as a whole. But output in central Europe has declined dramatically since the late 1980s, while Latin America also lost market share, although growth resumed in the early 1990s.

In the more capital-intensive textile sector, Far Eastern suppliers raised their share of OECD imports to 19.7 per cent in 1992 from 16.6 per cent in 1983, although the newly industrializing economies (NIEs) of Hong Kong, Singapore, Republic of Korea and Taiwan Province of China lost share to China, South Asia and the ASEAN countries.

In labour-intensive clothing, developing countries raised their share of OECD imports from 56.4 per cent to 61.1 per cent over the same period, with the main increased penetration coming from China (whose share almost trebled to 13.6 per cent), while Africa and Latin America virtually doubled their market shares. A striking feature of the trend in developing countries' exports of clothing to the OECD was the "flying geese" pattern, reflected in the steep decline in the share of the NIEs from 33.9 per cent in 1983 to 18 per cent in 1992. While this is partly explained by OECD protectionism via the Multi-Fibre Arrangement (MFA), the main factor at work was shifting comparative advantage within Asia. The NIEs moved upmarket into more capital- and skills-intensive activities, thereby creating opportunities for their less developed neighbours. Average annual FDI in clothing and textiles in the Republic of Korea fell from $189 million during the 1987-1991 period to only $5 million in 1992/93.

Globalization contributed to this successful Asian restructuring in the form of FDI within the regional cluster (see Box 3.1), although South Asia's involvement in this intra-Asian networking remained relatively weak. Western hemisphere clothing industries - the Caribbean, Mexico and Columbia - attracted FDI from the United States, while EU transnationals invested in the Moroccan and Tunisian clothing industries. But non-equity ties have had a greater impact, with EU firms purchasing finished products from suppliers in Turkey, Hong Kong and, increasingly, China; meanwhile, Mediterranean and ACP States have exploited their preferential access to the EU market by developing subcontracting arrangements with European manufacturers. Central and east European suppliers are also expanding their sales to the EU, with processed-clothing exports doubling in the three years to 1992. The main suppliers, accounting for 80 per cent of the total, were from Poland, Hungary and Romania.

continued

Box 3.2 (continued)

Chemicals

In capital-intensive chemicals, globalization has followed a very different pattern. The chemical industry accounts for 37 per cent of all German outward FDI and 23 per cent in the case of the United States. Chemicals fit the classical pattern of globalization, with exports growing faster than output and FDI faster than exports. The industry is dominated by ten OECD-based TNCs accounting for one fifth of global sales in 1988; concentration has subsequently increased as a result of mergers. The developing countries' share of industrial chemicals production, excluding China, has risen by 80 per cent since the mid-1970s, reaching an estimated 16.7 per cent of the global total in 1995 compared with 9.3 per cent in 1975.

Production is increasingly concentrated in Asia; in industrial chemicals, Asian developing countries doubled their market share to 12.6 per cent in 1993 (from 6.6 per cent in 1984), while, over the same period, their contribution to total developing-country production rose from 44 per cent to 70 per cent, mainly reflecting growth in production by Asian NIEs, but also expansion by lower-income countries such as China and India.

During a period when the developing countries' share of OECD chemical imports declined, the Asian NIEs pushed their share of developing-country exports up to 19 per cent in 1993 from below 10 per cent in 1984 - the mirror image of their loss of market share, to other Asian exporters, in clothing. Predictably, developing countries' market penetration of the chemicals sector has been lowest in high R&D activities such as pharmaceuticals.

With FDI in chemicals accounting for one-quarter of inflows to Argentina, Mexico, Republic of Korea and Taiwan Province of China, FDI has been the main driver of globalization in the chemicals industry. In particular, Japanese FDI has been crucial to Asia's integration into the world chemicals market, with Indonesia being the main location, while TNCs are the major players in Latin America, the United States and Germany. High growth forecasts for Asian chemical markets point to continued heavy FDI in this sector, while the Uruguay Round agreement on trade-related intellectual property rights is likely to foster even greater FDI investment in the latter half of the decade.

continued

Box 3.2 (continued)

Motor vehicles

By 1993, developing countries accounted for 19 per cent of world motor-vehicle production, again dominated by Asia, with 7.7 per cent. (The Republic of Korea's share of this total was 4.4 per cent and China's 2.5 per cent). The other major players in the countries in transition and the developing countries players were the Soviet Union (3.4 per cent), Brazil (3 per cent) and Mexico (2.3 per cent).

Data on auto part manufacture is sparse, but production is increasing in the Republic of Korea and Taiwan Province of China. While in the former market nearly 90 per cent of automotive inputs used by national assemblers are manufactured locally, in Argentina and Brazil local content exceeds 80 per cent and in Mexico 70 per cent.

In 1992, more than 17 per cent of global motor vehicle engine production was located in Mexico and the Republic of Korea (up from 11.3 per cent five years earlier), while Brazil, the Republic of Korea and Mexico have attracted auto part FDI from OECD car manufacturers.

Three features dominated globalization of the vehicle manufacture industry:

- FDI, especially in Latin America;
- Global sourcing by OECD manufacturers; and
- Strategic alliances and other non-equity links between OECD and developing-country firms, especially in Asia.

Source: UNIDO Background Paper, Gundlach and Nunnenkamp, *Globalization of Manufacturing Activity: Evidence and Implications for Industrialization in Developing Countries* (ID.WG.542/13 (SPEC.)).

CHAPTER 4. NEW TECHNOLOGIES AND COMPETITIVENESS

163. Since the early 1980s, UNIDO has undertaken programmes on technological advances for their adoption and use by developing countries to galvanize the industrial development process. Some progress at the international level has been achieved, but the technological gap between industrialized and developing countries has continued to widen. Few developments better illustrate the accelerating pace of technological advance than the speed with which newly industrializing countries have managed to double living standards. In the eighteenth century, it took the United Kingdom 58 years to double real per capita incomes, while in the case of the United States the process covered 47 years, between 1839 and 1886. Japan took 34 years (from 1885), while late industrializers, such as the Republic of Korea took eleven years (1966 to 1977) and China less than ten.[1/]

164. World manufactured exports from developing countries have steadily increased and they now comprise 26 per cent of the world total. With the new liberalized trading conditions providing greater access to developed country markets, it should be possible for the developing countries to continue to increase their volume of manufactured exports. This increase in export growth has, however, not been directly linked to the use of advanced technologies, and export competitiveness has not solely depended on technological factors.[2/] While some countries, such as Brazil, the Republic of Korea, Singapore and Thailand have concentrated more on export products based on high technology, most other developing countries have developed their export markets on less sophisticated technology. These alternative paths tend to merge over time through increased technological capability in developing countries. Indigenous technological capability building is therefore undoubtedly a vital function, and policy and institutional support needs to be provided.

165. No longer can competitive advantage be sustained by reliance on low-cost workers. The proportion of direct labour costs in the final product or service price has fallen and continues to decline, largely reflecting the impact of new technology - robotics, flexible manufacturing systems, advances in communications, in information technology and in the organizational structure of business enterprise. Labour productivity is driven by investment in technology and human capital - the education and training of the workforce - and by new ways of organizing and coordinating production, inventory management, distribution and marketing. In many industries, software considerations have reduced the relative importance of massive investment in highly capital-intensive operations. Increasingly quality and product innovation are the driving force underpinning competitive advantage rather than the cost and price.

166. The importance of technology for the competitiveness of developing country enterprises in global markets has to be viewed not only in terms of entry to such markets, but also the capability to remain in them. It has been possible for developing

---

1/ UNIDO, *Industrial Development Global Report, 1995*, p. 8.

2/ UNIDO Background Paper, Charles Cooper, *Technology, Manufactured Exports and Competitiveness* (ID/WG.542/5 (SPEC.)).

countries to enter world markets with relatively low-technology manufactured products based on indigenous technology with high labour intensity. Another route for developing country enterprises has been to base their products on foreign technology. The latter strategy of technological imitation is likely to play a much more limited role in the future as competitiveness in world markets is increasingly based on technological innovation for differentiation in products, services, costs and business architecture in general.

167. The management of strategic technological innovation at the enterprise level involves a blend of R&D and technology transfer in varying proportions, and needs to be carried out through multifunctional efforts, often cutting across organizational boundaries of the enterprise's cluster (clients, suppliers). In view of the information gaps in learning and innovating in increasingly open markets, enterprises in developing countries and transition economies, particularly SMEs, tend to underinvest in technological innovation.

168. The evidence from industrialized countries has shown that government support policies for technological innovation at the enterprise level is essential. The forms of this support may vary from technical and commercial information services to support for R&D activities to capacity-building for technology management at the enterprise level.

Box 4.1
Technology and Competition in Latin America

- Technological gaps among Latin American companies are far greater than those found in the industrialized economies. Three categories of companies have been identified:

  (i) A tiny minority of firms, numbering less than one per cent of the total. These are technology-intensive firms, participating in crossborder strategic alliances and driven by experienced, innovative managers;

  (ii) A group of between 30,000 and 50,000 enterprises, motivated to implement new technologies and new quality products and processes. Such firms, however, are heavily reliant on an imitation strategy utilizing "static and shelf-ready technology" rather than continuous technological upgrading

  (iii) Over 90 per cent of the total number of enterprises operate within local market "niches" with varying degrees of success.

continued

Box 4.1 (continued)

- A study of 100 Group (i) companies found:
  - A high correlation between innovation, productivity, exports and profitability;
  - Highly aggressive innovation strategies - a high risk approach stressing market leadership and considerable product innovation;
  - Highly independent firms, demonstrating little concern for government obstacles and incentives or for local competition;
  - The most frequent motivation for innovation is to differentiate through quality, increase productivity, and penetrate export markets;
  - Government incentives were of "minimal motivational significance".

Generic technologies mean intensified competition

169. Technological development over the last two or three decades has clearly shown the increasing importance of generic new technologies. The classic examples of these generic technologies are biotechnology, new materials, and information technologies. These technologies lead to entirely new products, markets and business opportunities. A key issue is that their impact is trans-sectoral and they can drastically improve the competitiveness of products and processes of enterprises in a large number of industrial subsectors.

170. Advances in information technologies have had the most significant impact on the global manufacturing sector. They have led to a whole range of advances in industrial automation including computer numerical control, computer aided design and manufacture, and flexible manufacturing systems. The introduction of such new technology has not only improved productivity, but it has also led to major improvements in quality and consistency of products, which are major elements of competitiveness.

171. Moreover, the interaction among new generic technologies themselves create unparalleled business opportunities for developing countries. New bio-materials increasingly draw on new genetic resources and engineering. The recently developed combinatorial chemistry technologies are not only producing more new chemical compounds in just a few years than the pharmaceutical industry previously did in its entire history, but also allowing the development of 10,000 new materials in single experiments. Rapid prototyping augments advances in information technologies and in new materials to speed up product development, increasing quality and reducing costs through stereolithography. Advances in the systems that process and transmit information is mainly dependent upon progress in materials science. The joining of computers and biotechnology into the new field of bioinformatics, believed to be as important as biotechnology itself, is not only changing the face of biotechnological R&D, substituting all animal- and human-related pharmaceutical research testing, but also inserting biotechnological products in the electronic industry, such as biochips.

The impact of industrial automation on competitiveness in developing countries

172. Products affected by industrial automation in mechanical engineering (home electric appliances, transport equipment, power and electrical equipment and many types of machines) make up a large part of manufacturing output in the more advanced developing countries. It is often argued that developing countries should continue to utilize conventional technologies to manufacture such products because they are more labour-intensive than automated techniques.

173. Although there may be little justification for the use of advanced flexible manufacturing systems or robotics in most developing countries, the failure to upgrade technologically would exclude such firms from partnerships in an increasingly globalized and oligopolized mechanical engineering industry where industrial automation will become the dominant technology in the near future.

174. Even in developed countries, the pushing of closed proprietary systems by vendors, coupled with too high expectations on the part of clients, have substantially hampered the widespread application of FMS. With the introduction of open systems, this situation is changing and developing countries can benefit from this shift. Current systems' priorities include the integration of functions to improve time to design, manufacture and commercialize a new product. Electronic data interchange (EDI) is widely believed to be a key technology for this purpose.

175. The drive for competing through mass customization and product variability places a strong pressure on the capability of enterprises for effective product innovation management. The exponentially increased amount of product data which needs to be created, controlled and rapidly processed cannot be effectively dealt with by conventional means. As a consequence, new software for product data management (PDM) is quickly outgrowing the past use of managing CAD files more effectively to become the fastest growth area for computing in the manufacturing sector (growing from revenues of less than US$100 million in 1989 to US$600 million in 1995 and to a projected US$1.6 billion in 1999).

- New PDM versions allow the management of product data across the company, from drawings to CAD files to assembly structures, to technical blueprints, to data transfer, to suppliers and clients. As a consequence, improved conditions not only reduce the time it takes to access data, but also the number and cost of changes, thereby minimizing the length of change cycle. This results in reduced time to market, lower costs, improved quality, flexibility for future changes, early involvement of clients and suppliers, and other competitive advantages.

- Furthermore, when integrated with other software packages for product design and simulation, including virtual reality and rapid prototyping, the use of PDM may even enhance these advantages for cost-effective manufacture, maintenance, disassembling and recycling, in line with design for disassembly (DFD) requirements. Through building virtual products that behave sufficiently like real products, with on-line contributions from suppliers and clients, these programmes

enable the production of just one physical model prior to manufacture, further strengthening the competitive advantages mentioned.

- It is important to note that these programmes rely on the distribution of digital engineering data within and across organizations, including suppliers.

- If developing country's enterprises are not able to transfer, create or assimilate these technologies, their future capability to participate in strategic business alliances, in international manufacturing subcontracts, particularly with value-adding design and engineering services, may be seriously hampered.

Gradual shift to flexible manufacturing systems (FMS) in developing countries

176. It is clear that flexible manufacture, increased automation and associated software have emerged as essential technological features of manufacture in industrialized countries and that this process will be further extended during the next decade. To the extent that such technologies are gradually extended in developing countries, substantial changes in structures will be required for management of technology at the enterprise level, together with policy and institutional support at the initial stages. The extent to which the automation of production processes replaces labour also requires careful assessment of both the implications of labour displacement, and the stage at which such replacement is financially viable. The capital costs of robotics and automated processes are still very high and may be able to be justified in most developing countries with abundant semi-skilled labour only with respect to selected areas.

177. Developing countries must promote some kind of industrial automation starting with CNC machine tools and computer-aided design, which provide an entry point to the technology without the heavy capital investment required for robotics and FMS.

178. Apart from the Republic of Korea and Taiwan Province of China, only Brazil, India, Singapore and possibly China are producing significant amounts of CNC machine tools and process control technology. Even in India and Brazil there is a question mark over the viability of domestic production, as local CNC machine tool producers have lost market share to imports, following trade liberalization.

Box 4.2
Industrial automation in the mechanical engineering industry

Industrial automation in the mechanical engineering industry has had six major beneficial effects:

- Production processes are becoming more homogeneous across industry as technological diversity is reduced, so that large and small batch producers use the same core technologies.

- Productivity, especially among producers of small and medium batches, has increased dramatically. Productivity increases of 50-100 per cent were achieved when moving to CNC machine tools from conventional machines, and of 250-650 per cent when moving to flexible manufacturing systems (FMS).

- Capacity utilization increases, with gains of up to 80 per cent, in firms using FMS.

- Unit costs fall due to reduced labour costs (although training costs rise because of increased skill requirements), as well as savings in raw materials (more precise cutting and less waste) and energy. One survey finds average unit cost savings of 41 per cent when FMS systems are introduced.
- Product quality improves, reflecting lower defect rates and enhanced product performance in terms of greater precision and durability.

- Lead times decline from as much as 90 days to only two or three days.

Source: UNIDO Background Paper, Ludovico Alcorta, *The Impact of Industrial Automation on Industrial Organization: Implications for Developing Countries' Competitiveness* (ID/WG.542/11 (SPEC.)).

Biotechnology

179. In contrast to industrialized countries, most developing economies have achieved only limited development of modern industrial biotechnology. Most of these countries lack proper promotional, regulatory, risk assessment policies and mechanisms; do not have access to timely information on technologies, markets and opportunities, lack support for the creation of new biotechnology businesses, particularly concerning genetic resources, and face a considerable shortage of specialized skills for the management of bioindustrial innovation. Some recent initiatives, such as the Argentinean/Brazilian Centre for Biotechnology (CABBIO), established within the context of MERCOSUR aim to mitigate those deficiencies. Considerable initiative has also been undertaken for

biotechnology research at the national level, including in India, Malaysia, Pakistan and Thailand among Asian countries, in Argentina, Brazil, Chile, Costa Rica, Cuba and Mexico in Latin America and in Nigeria in Africa.

180. In most of these countries, incipient policies have been attempted to stimulate bio-technology business, while regulating environmental risks and the potential loss of proprietary resources. In several cases, FDI has been encouraged, besides joint ventures and strategic business alliances of local companies with foreign enterprises, but there has been considerable delay in the proper utilization of genetic resources, which constitute one of the vital tradeable products for gene-rich developing countries in the future.

181. Policies to promote the international trade of products based on indigenous genetic resources should be gradually promoted. The global market for genetic resources is currently estimated at US$250 billion/year and a substantial share of this growing market could accrue to developing countries.

182. As R&D on indigenous genetic resources receives greater impetus, the efforts should go beyond prospecting into synthesis, product development, business creation and trade, in spite of the traditional daunting odds of discovering new marketable products, recently made easier by combinational chemistry technologies.

Box 4.3
Bio-resource development in Nigeria

The Bio-resources Development and Conservation Programme, started in Nigeria, has now spread to five Central African countries. The prospecting for genetic resources through "safari science" carried out with the involvement of poor communities in association with international pharmaceutical companies is another interesting model. Its financial support to community-level activities is a good example of how high-tech can assist poverty alleviation.

183. While bio-businesses are flourishing globally, the risk of losses of national proprietary genetic resources is very real and the regulation of underground leaks and other "asset depletion" is necessary. Examples like the loss of the alkaloid from Cameroon's *Ancistrocladus Korupensis*, which inhibits the growth of the *AIDS* virus, and of the *Astaxanthin* molecule and the genus Phaffia are illustrative. *Astaxanthin* gives the pinkish cast to shrimp, lobster, salmon and is possibly the most powerful antioxidant in nature, which may become an effective anti-cancer agent in the future. Prevalent in algae, plankton, krill and other foods at the base of the oceanic food chain, the molecule *Astaxanthin* is now made synthetically and, at more than US$1,200 per pound, is sold to aquaculturist farms raising salmon.

184. Genetic resources should also be considered for adding value to related plants. Recent advances in enzyme chemistry are making it scientifically feasible to genetically re-engineer plants in order to manufacture particular chemicals. Given the genes to generate the ones that together catalyse the right reactions, plants might prove able to produce their own protective pesticide. Plants might be made to create novel synthetic pathways leading to new products altogether. These developments may open new opportunities for developing countries to add value to their genetic resources in the future and further erase the boundaries between industry and agriculture.

185. Developments in biotechnology during the next decade are likely to be very far-reaching in their scope and application. It is difficult to anticipate the enormous range of new uses and applications that can be developed in sectors such as agriculture, pharmaceuticals and chemicals. It is necessary for developing countries to expand biotechnology research, both through research institutions, universities and enterprises, and also to develop close technological linkages with foreign biotechnology institutions and enterprises.

New materials

186. Developments in materials science have been very rapid and are having a considerable impact on competitive capability in various fields, ranging from energy engineering to information and communications (optic fibres), transport and automotive design and production and microelectronic systems. New and advanced materials range from composites with very high strengths to silicon wafers. The development of new composites, ceramics, special alloys and functional materials, including electronics, magnetic and super-conductive materials, besides photonics and sensor devices will inevitably have a major effect on materials usage in various fields.

187. Materials research is expensive and requires interdisciplinary capability and costly facilities. Nevertheless, effective research has been, and is being, undertaken in several developing countries with respect to building materials and polymers and composites based on local materials. Such research needs to be promoted through institutional support, while technological linkages and partnerships should be sought for access to new materials for use in construction and the manufacture of various products, ranging from water pipes to automotive equipment.

188. The technological impact of new materials on several industrial subsectors will be very significant. Because of their central importance for the development of new products in many industrial subsectors, materials and related processing technologies are viewed internationally as being at the core of product and process innovation efforts to provide an international competitive edge to enterprises in these subsectors. There will be significant spillover effects on virtually all industrial sectors from the application of new materials technologies.

189. For the period beyond 2000, new materials engineering will provide the greatest degree of interlinkage with other engineering fields and with major positive external effects in energy, transportation, housing, health, etc. The paradigm for materials

competitiveness is that the synthesis of new materials must be integrally linked with the design and processing of the corresponding final products, since the materials are only basic components of complex systems and, as such, critical to their performance. Thus, improvements in materials quality and price can have dramatic effect on international competitiveness across subsectors.

190. Priority applications are expected to focus on energy engineering; transportation systems; information and communication systems; micro-electronic systems; optoelectronic systems; and medical engineering.

191. Innovations in engineering materials have created major technological advances in recent years and the trends are set to continue into the next century. Worldwide demand for advanced materials has been increasing rapidly within the last decade and it is forecast to rise by 2000 and beyond. Between only 1985 and 1988, the number of worldwide companies involved in advanced materials grew from 302 to more than 1,800. The most important impetus for new materials comes from large TNCs in industrialized countries. Analysis of industrial materials research in Germany, Japan, and the United States demonstrates that the companies with the greatest turnover attach high importance to materials research, and that 33 of the 50 companies with the highest turnover around the world invest in materials research. The specific R&D plans and projects of the firms are focused on strategic corporate goals. On the whole, however, materials research activities indicate considerable potential for cooperative research activities.

192. The design and structural control of advanced high performance materials for use in hazardous and extreme environments such as intermetallic compounds and advanced composites are also important R&D fields, together with electric batteries for the automobile industry. As discussed earlier, information technology is a rapidly evolving set of technologies, both hard and soft, encompassing, *inter alia*, communications (mobile, satellite, rural, and others), photonics, computers, information networking, software, information storage and support systems. The changes are propelled by a series of chain reactions due to the fusion of many technologies as well as their applications, fuelled by the speed requirements of data-accessed processing for decision-making in globalizing markets.

Conclusion

193. The pattern of technological development has varied considerably. The impact of such development is generally assessed in terms of increased production. It is equally important, however, that such production is competitive in internal and external markets and in terms of manufactured exports. In most developing countries, technology issues have revolved largely around the development of technological infrastructure, the acquisition and use of foreign technology or development of indigenous technological capability. With increasingly open markets, the principal emphasis must now shift to the development of technological innovative capability at plant and cluster levels for the achievement of sustained competitiveness.

EMERGING ISSUES FOR INDUSTRIAL TECHNOLOGY POLICIES

194. With the increasing costs of research and development and the shortage of technical research personnel in industrialized countries, an area of considerable potential for developing countries is outsourcing of research in these countries. Several TNCs have set up research facilities in developing countries, including Nestlé, Astra, Texas Instruments, IBM, Hewlett Packard and AIWA. Such research facilities benefit from the much cheaper costs of R&D personnel in these countries. At the same time, the results of research accrue only to the parent company, which provides the necessary investment for the research facilities. This pattern is expected to grow during the next decades, with research activities being increasingly undertaken in developing countries and in transition economies, which have a large pool of scientific and technical personnel available at a much lower cost. It should be possible, however, for developing countries to also undertake specific research activities under contractual arrangements with foreign companies as in the case of software research and development in India. This will constitute a new form of international subcontracting with considerable potential.

195. In the light of the key role of technology for competitiveness and global trends and developments in this regard, the principal issues and policy options that need to be determined are the following:

- In order to strengthen the technological base in less developed countries, increased foreign technology will be necessary, including through increased economic and technological cooperation between developing countries (ECDC/TCDC). While initiative in this regard must be taken primarily by national enterprises, policy and institutional measures will be necessary, both to promote technological partnerships and linkages with foreign enterprises and for rapid technological absorption and adaptation. Indigenous technological development must also be promoted through applied research activities in enterprises, universities, R&D institutions and other technology-innovation bodies;

- It is necessary to ensure closer linkages between privatization policies and increased use of innovative technologies. This should include infrastructure activities, particularly the operations of privatized utility companies, which must become increasingly competitive. Increased technological competitiveness of State-owned enterprises must also be ensured during any process of restructuring;

- It is essential that technological innovations and use of new generic technologies are promoted in resource-based industries and the industrial commodities sector, as also in various manufacturing subsectors, both through upstream (improvement of raw materials, productivity etc.) or downstream (re-engineering customer services) activities, or through strategic business alliances for technology on R&D;

- Efforts should be made to promote technological research activities of TNCs in developing countries and transition economies and to channel new TNC investments to more dynamic and complex subsectors, including those involving new generic technologies;

- National and regional R&D institutions in developing countries and transition economies can develop a strategic framework and monitoring mechanisms for dealing with new generic technologies, including through subcontracting with foreign firms;

- Developing countries and transition economies can derive the full benefits of the Uruguay Round Agreements through technological innovations in various subsectors and product ranges, taking into account the provisions of the Agreements on TRIMs and TRIPs;

- It would be desirable to develop a "fair competition" environment for national companies in high-tech sectors, particularly informatics and biotechnology, and to ensure that their activities are promoted and strengthened;

- The competitiveness of national enterprises engaged in international services subcontracting through electronic networks should be strengthened through increase of their technological innovation capability;

- Regulatory measures should be drawn up for biosafety, for safe and efficient use of advanced new materials, for technologies required to design new products with a view to disassembly, reprocessing for reuse or safe disposal of components (design for disassembly (DFD)), besides other environmentally suitable technologies;

- The growing relevance of technological innovation in manufactured-related services for sustainable competitiveness needs to be highlighted. It should be considered how related capacity-building processes can be accelerated in developing countries and economies in transition.

- It is necessary to formulate and implement new creative financial and fiscal incentives for promoting innovations.

196. The management of technological innovation or technology management, should be viewed as the core of industrial policies in developing countries.Accordingly, *crash capacity-building programmes for the proper manugement of technology (MOT)* in public and private enterprises, besides innovation system agents like R&D institutes, small and medium consulting enterprises, incubators, etc., need to be considered. Through this programme, the learning process in existing enterprises would be accelerated to overcome the lack of "Innovation tradition" culture as the differentiator between the highly innovative companies of industrialized countries and their counterparts in the developing world. This capacity-building process should not only consider the development of *ad hoc* MOT methodologies and human resource development programmes, but also field studies and *demonstration effect projects* to ensure the ample dissemination of successful experiences, e.g. the clustering of innovative large medium and small enterprises around joint innovation programmes to facilitate the on-the-job exchange of MOT experiences; forums for the advancement of MOT techniques; MOT performance benchmarking; and other initiatives to promote the culture of innovation.

197. The MOT capability thus developed should catalyse the complementary business re-architecture and network abilities for sustained competitiveness and include the managerial technologies - leadership styles, teamwork, communication and negotiation skills, human resources empowerment, etc. - required to sustain the high quality services required by customers.

198. Radical innovations in services seem particularly necessary to achieve competitiveness in internal and external commercialization activities, in subcontracting of international services, high-tech businesses, DFD, and to enhance the competitiveness and survival of national companies catering only for domestic markets.

199. The following fields of technology management require special emphasis by developing countries and economies in transition during the short-term:

- Diagnostics of the technological competitive position of companies and consequent definition of technological strategies for sustainable competitiveness, highlighting *ad hoc* blends of R&D and technology transfer activities;

- Management of R&D for devising new selected applications of existing and emerging technologies - different functions from the ones for which they were originally intended;

- Management of R&D for industry-related services;

- Management of technology transfer negotiations and agreements, including technology absorption and adaptation;

- Product innovation particularly, but not exclusively, industrial design for DFD;

- Technology information - particularly on clean technologies - technological forecasting and monitoring;

- Performance benchmarking, total quality management and process re-engineering.

200. Policies for strengthening and regionally integrating innovation-system-supporting agents - such as R&D centres, small and medium consulting enterprises, standardization boards, incubators, etc. - should aim at the multiple channelling of those MOT capacity-building services for the required level of MOT effectiveness in private sector enterprises. Strengthening small and medium management consulting enterprises, for instance, with MOT methodologies and ready access to up-dated information on clean technologies, may turn them into new channels to promote technological innovations in the private sector, which are both competitive and environment-friendly.

201. Sophisticated equipment and human resource development programmes in R&D centres and standardization boards contribute to providing the specialized services required to overcome technological non-tariff barriers. Incentives for the establishment of both MOT capabilities and R&D centres in large enterprises might be balanced with R&D consortia for SMEs plus internal MOT capabilities in each company. Furthermore,

MOT capabilities at the policy level, either national or regional, should provide for the continuous MOT proficiency of the different agents of the innovation system, benchmark their respective performances and possibly integrate them through electronic networks.

202. A critical aspect of technology policy in developing countries relates to human resource development unrelated to MOT. This has to be considered at two levels. First, a strong entrepreneurial culture has to be developed and a strong entrepreneurial class has to be developed which recognizes the key role of technology at the local enterprise level. Second, with the growth of demand for new products and new technological applications, new categories of technical personnel need to be created. While emphasis has been given in most countries to higher science education, equal emphasis is necessary on education and training facilities for specialized technical personnel - such as computer programmers, systems designers and specialists, besides microbiologists and specialized researchers in biotechnology, and energy specialists - the demand for which will multiply with the growth of new technological applications.

Box 4.4
Technology policy orientation in Mexico

Prevailing policy orientation

In the last decade there was an important shift from a supply side policy to one that attempts to reinforce the demand side of the equation. Thus, technology policy in the current administration, as implemented by CONACYT, has some new lines of action, such as: i) placing the firm and the entrepreneur at the centre of the process of innovation and modernization; ii) creating, together with other public entities, support centres for competitiveness; iii) impelling firms to develop their "learning capacities" so that they can participate in both the process of innovation and the continuous improvement of productivity and quality. These main threads are guiding the redesign of programmes and instruments, which are now being directed: i) to promote investment by firms in learning capacities through financial stimuli and non-economic support for the creation of centres for competitiveness, where firms should be the source and users of the innovative process; ii) promote the elimination of bottlenecks in information flows, and the connection of scientists and technicians with firms; iii) promote the use of international standards and norms and support the diffusion and utilization of quality control methods; iv) support programmes for the development of suppliers in public entities; v) promote technological centres which can offer normalization and metrology services, as well as technological services for industry in general; vi) support linkages between firms and research institutions. As seen from these measures, the emphasis is clearly placed on strengthening the demand side of the innovation process.

continued

Box 4.4 (continued)

Specific recommendations

A stronger and more extensive technology management practice in firms, as well as the availability of appropriate mechanisms to promote it, are at the core of almost any recommended strategy for improving Mexican firms' technological capabilities. As long as firms strengthen their managerial resources and skill in technology management, other aspects of their technological capabilities will also improve. Self-awareness, monitoring and assessment of technological opportunities from improved technology management lead to better strategy definition. Quality and productivity are better aligned to longer term R&D strategies if companies possess well trained technology management personnel. Incorporation of R&D results and new technologies into the firms' operations is another key issue to technology management. Thus, it is important to promote stronger and more diverse training programmes in MOT; low interest rates for the first stage of development of technology management skills and capabilities in micro and small firms; and more diverse and strong consulting and advisory services on technology management to tend to industrial firms and public R&D centres.

203. Given the essential need for MOT, developing countries and economies in transition must accord the necessary priority to technological innovation required for sustainable competitiveness, beyond the relatively limited efforts in the past, which were mostly confined to R&D activities. The required measures and incentives should cover the whole gamut of technological innovation and associated activities, including strategic technology-planning at the enterprise level, technology transfer negotiations, monitoring and forecasting, benchmarking, management changes in leadership style, teamwork, human resource empowerment, total quality management, re-engineering, networking through international strategic business alliances, etc.

204. Finally, the strengthening of the capacity of central institutions in charge of policy design and implementation, including the coordination of the work of innovation system agents, merits special attention. The diversity of areas and agents involved, their different capacities, and willingness to cooperate with each other have frustrated the implementation of many policies in the past. The above can only be achieved if macro-economic policies are congruent with and supportive of technological policies. Exceptions like the case of the Republic of Korea should illustrate the above.

Box 4.5
Industrial technology policy in the Republic of Korea

The Republic of Korea has built up a deep and diverse industrial structure through deliberate governmental interventions in the trade and industrial regimes, guiding the allocation of industrial investments in particular directions, relying less on direct foreign investments, and pressing local firms to be export-oriented in the short term.

The resulting technological challenge was met by promoting the involvement of national private firms in licensing technology from abroad, technology absorption and imports of equipment. Simultaneously, the government stimulated firm-level training, allocating massive resources to high-level technical education (1991 - 17.6 researchers/10,000 people, goal for 2000-30/10,000), to R&D projects approved by the *chabeols* and to building-up the S&T infrastructure:

Republic of Korea - Evolution of R&D Investment

Year	Amount US$ million	% GNP	Ratio of public/ private expenditure R&D
1981	418	0.64	50/50
1991	546	2.02	20/80
1998		4.00 (goal)	
2001		>5.00 (goal)	

Criteria for strategic national R&D projects: technological intensiveness, broad international competitive advantage, conservation energy and resources, growth potential, spillover effect, contribution to social development.

205. The above elements will obviously vary in their significance from country to country. What is, however, important is to view the technology policy framework as a dynamic and continuing process that is directly related to the technological needs of the existing principal production sectors in each economy and emerging new area.

206. It is of growing importance, at the national level, to assess and forecast the impact of new technological developments on national economies. This is a field of growing

complexity with the fast pace of technological change. The monitoring of technological change is of particular importance in developing countries and must be viewed as an integral element of technology policy in these countries. The appropriate mechanism for such assessment may differ from country to country but the basic objective of regularly monitoring, assessing and forecasting new technological developments, and their impact on the respective national economies, is of vital importance.

207. Through its human resource development and technology services, UNIDO is in a position to support developing countries and economies in transition to face effectively the new technological and competitive challenges in the future world industrialization environment.

CHAPTER 5. TRADE LIBERALIZATION AND INDUSTRIAL DEVELOPMENT

208. Both the Uruguay Round agreements and the establishment of the World Trade Organization (WTO) will have far-reaching repercussions on industrialization in developing economies. In joining the WTO, developing countries have committed themselves to accepting the entire Uruguay Round package of trade reforms. "Partial compliance is no longer an option".[1/]

209. In terms of export market prospects, the main gains to developing countries will be:

- Improved access to the markets in developed market economies; and
- An "insurance policy" against future barriers to those markets.[2/]

210. The two main Uruguay Round provisions with near-term implications for industrialization in the developing countries are:

- The phasing out of the Multi-Fibre Arrangement (MFA) over ten years; and
- Tariff cuts.

211. At the same time, most African and Caribbean countries are likely to face overall negative effects of the Uruguay Round Agreements, as compared with existing preferential arrangements, particularly during the short term, and will need to bring about considerable restructuring in potential growth sectors and enterprises so as to achieve greater competitiveness and export-oriented growth. There are threats as well as opportunities for developing economies. Following Uruguay Round liberalization, the developed market economies may also selectively resort to safeguard and anti-dumping actions to reduce the rate of import growth.

MFA abolition

212. Under the MFA, trade in clothing and textiles is subject to quotas on developing country exports negotiated bilaterally between importing industrialized countries and exporting developing countries. As the MFA is phased out, clothing and textile products will be integrated into the WTO, meaning that tariffs will be the only border measures allowed.

213. Given the dominance of clothing and textiles in developing-country exports to industrialized economies, it might be expected that the phasing-out of the MFA and the

---

1/ UNIDO Background Paper, Tracy Murray, *Effects of the Uruguay Round Agreements on Industrialization in Developing Countries* (ID/WG.542/15 (SPEC.)).

2/ Gary Hufbauer and Marie-Helene le Manchec, *Implications of the WTO and NAFTA for Developing countries*, UNIDO, December 1994.

removal of bilateral export quotas would be of substantial benefit to developing-country exporters. However, this might not be the case, for two main reasons:

- The liberalization process is backloaded so that 51 per cent of international trade in textiles and apparel will be switched from quotas to tariffs during the first three phases of a four-stage process. The remaining 49 per cent will be liberalized by way of a "big bang" at the end of year ten. The near-term impact on developing-country exports is also likely to be diluted because industrialized countries are almost certain to integrate the least import-sensitive items first, leaving the bulk products until 2005. There is the further possibility that, as the date for final implementation draws near, future Governments will come under intense pressure to renege on aspects of the deal.[3/]

- If the agreement is implemented fully and trade in clothing and textiles is substantially liberalized, market conditions will change markedly. The abolition of export quotas will mean that all exporters will have to compete on a level playing field. While, as a group, developing economies will gain from the elimination of the MFA, the gains will not be evenly spread. The more efficient developing-country manufacturers will benefit at the expense of some of the less competitive, resulting in dramatic changes in market share.

214. A conservative estimate of developing-country export gains on account of quota liberalization alone is $50 billion (if liberalization had taken full effect in 1992), while by 2005, assuming 4 per cent annual growth in the clothing and textile trade, the gains from quota elimination are estimated at $80 billion.[4/]

- Because the clothing sector is highly labour-intensive, low-wage economies may well take market share from their higher-wage counterparts. China and India seem likely to gain at the expense of the Asian newly industrializing economies (NIEs) and other higher-wage States in Latin America. According to one estimate, "far more" developing countries will be net losers from MFA abolition than net gainers. In turn, this implies ongoing restructuring of industry in such countries, especially early in the twenty-first century, when the full impact of MFA abolition will be felt.

Tariff reductions

215. Tariff cuts will be phased-in equally over five years, with the main impact being felt in the near term. It has been suggested that the impact will not be great for low-tariff products sold to OECD importers. Pre-Uruguay Round tariffs average 6.3 per cent so that the 2.4 per cent Uruguay Round reduction will reduce the average tariff rate in industrial countries to 3.9 per cent. However, even modest tariff reductions may benefit developing-country exporters significantly:

3/ UNIDO Background Paper, Tracy Murray, *op. cit.*

4/ UNIDO Background Paper, Gary Hufbauer, *op. cit.*

- Because past tariff-reduction agreements focused on the least import-sensitive items, where tariffs were cut by the largest amounts, future liberalization will involve more import-sensitive products opening the way to significantly-increased exports by developing States.

- Furthermore, tariff cuts contribute directly to exporters' bottom-line profit performance. Thus, where exporters have a 5 per cent profit margin on sales, a 1 per cent tariff reduction is equivalent to a 20 per cent increase in margins.

- Average trade-weighted tariff rates are misleading; because high tariffs reduce imports, they have smaller weights in the calculation of trade-weighted averages. Conversely, low tariffs have heavier weights, implying that when all tariffs are reduced by similar proportions, the cuts at the high-tariff end boost trade disproportionately.

- While average tariffs in industrialized countries may be low, individual developing-country exports still attract high duties. Major such exports, including clothing, textiles, footwear and leather, rubber and travel goods, face tariffs of more than 15 per cent. A 20 per cent reduction in such rates will considerably improve developing countries' market access.

- The reduction of tariff escalation is particularly important for developing-country industrialists; in the leather industry from hides and skins to leather, though not from leather to leather products; in the wood industry from semi-manufactured lumber to finished wood articles, though not from logs to lumber or wood-panels; from paper to paper articles, though not from pulp to paper; in the jute industry from fibres to yarns; in tobacco from raw tobacco to tobacco products (a significant reduction); and from unwrought nickel, lead and tin to semi-manufactures. Reduced escalation will encourage greater processing, although in one important sector - yarns to fabrics - escalation has actually increased.

Tariff cuts among developing countries

216. One third of developing-country exports of manufactures are purchased by other developing economies, and these will benefit from the Uruguay Round in two ways:

- The more important developing-world trading countries will cut average tariffs by about one fifth from 25 per cent to less than 20 per cent.

- The agreement to tariff binding with the Uruguay Round will mean that developing-country imports of products subject to bound tariffs (i.e., that cannot be raised) will increase from 25 per cent to 75 per cent of their total imports.

217. The average bound duties on industrial goods imported by developing countries - typically higher than applied rates - are estimated to fall to 12.3 per cent from 15.3 per cent, with the tariff reduction package as a whole affecting developing economy imports valued at around $305 billion.

- On the average, tariff rates applied by developing countries will drop by only two or three percentage points, leaving many applied rates in the range of 10 per cent to 30 per cent. Hufbauer estimates the impact of applied tariff cuts on trade between developing countries at some $50 billion by 2005.

218. Although all the Uruguay Round tariff changes will benefit developing-country exporters, reductions in Most-Favoured-Nation (MFN) tariff rates will erode the preference margins enjoyed in EC markets by the 70 African, Caribbean and Pacific (ACP) States, as well as preferential entry to industrialized countries in terms of the Generalized System of Preferences (GSP). In the near term - i.e., over the next five years - the main developing-country beneficiaries of the Uruguay Round will be:

- Exporters of leather, rubber, footwear and travel goods, which will enjoy standard tariff reductions;

- Those exporters of tanned leather, wood and paper products and yarns or jute who gain from the reduction in tariff escalation.

219. Although such potential gains may not appear to be impressive, it should not be forgotten that tariffs will come down for a wide range of industrial goods; furthermore, since such tariff reductions go straight to the bottom-line profits of manufacturers and importers, significant world trade expansion is likely, with extensive benefits for developing countries. Market access will improve significantly for developing-country exporters of industrial products.

Longer-term implications

220. Both the trade-related investment measures (TRIMs) and trade-related aspects of intellectual property rights (TRIPs) agreements provide for grace periods before developing countries are required to conform with WTO rules. In general, the grace period is five years, although this is being extended for least developed countries. The adverse effects of both agreements will not therefore start to be felt until the next decade.

Trade-related investment measures

221. Many developing countries have linked investment incentives (usually in the form of tax-breaks or import protection) to trade requirements in the hope that foreign firms will enter into high-cost local purchasing agreements. Often, the net effect is lower real income for the developing economy, with the added danger of the system becoming self-perpetuating because foreign firms enjoy the benefit of lower taxes or protection from competition while the developing country Government achieves greater employment and domestic value-added.

222. Under the TRIMs agreement, developing economies will have to abolish local content requirements and trade balancing tests within five years - least developed countries have seven years and developed market economies two years - though they will

be allowed to temporarily apply TRIMs for infant-industry and balance-of-payments reasons.

Box 5.1
TRIMs and the Philippine motor vehicle industry

Vehicle assembly in the Philippines is protected by a virtual embargo on the importation of new vehicles. In return for this major competitive benefit in the domestic market, established firms must meet domestic content and minimum export requirements. The import restriction drives up the prices of motor vehicles, thereby encouraging domestic production, but local content and export requirements increase the costs of assembly and marketing, encouraging high cost domestic production while imposing heavy costs on domestic consumers. If the Philippines Government fully implements the TRIMs agreement, these distortions will be phased out over the next decade.

Source: Gary Hufbauer, *op. cit.*, p. 22.

223. To the extent that it narrows the range of industrial policy options available to developing country Governments, TRIMs will have important implications for developing countries and transition economies. In the past, developing countries have made extensive use of such measures and their phasing out will force Governments to find alternative means of broadening domestic content and ensuring enhanced export capacity. On the other hand, the disciplines imposed on member States are less than onerous; host countries retain the right to regulate FDI as long as the TRIMs agreement is not infringed, though, in general, performance requirements may not be imposed on foreign investors.

224. Furthermore, developing-country attitudes to FDI have changed radically. Most States have implemented FDI-friendly regimes and are liberalizing their foreign investment regulations, even without Uruguay Round pressures in the form of the TRIMs rules.

Trade-related aspects of intellectual property rights

225. Because the bulk of marketable intellectual property is currently owned by OECD-based firms, the TRIPs agreement will work to the disadvantage of the developing countries in two main respects:

- Developing-country firms wishing to produce and sell products covered by patents will be forced into licensing agreements, invariably involving royalty payments to the patent owner. In some cases, foreign TNCs will prefer to serve the market

themselves by direct export so that there will be no local production. As a result, potential employment opportunities will be lost, while developing countries will be required to introduce and enforce legislation for the protection of intellectual property.

- The agreement could well stifle R&D activities in developing countries. In the absence of TRIPs, developing-country firms sought to copy (reverse engineer) products patented in the industrialized countries for sale in the domestic market, thereby creating jobs and ensuring competition with the imported item. The development of such R&D capacity is crucial to a country's ability to upgrade its technology, and the quality and range of its industrial production. The TRIPs agreement could well undermine this process, with adverse longer-term consequences for technological upgrading.

226. Developing countries could partly remedy this situation by:

- Exploiting the agreement's compulsory licensing provisions, though these have been made operationally more difficult, since non-use of a patent is no longer a criterion that may be applied.

- Ensuring that patented products are produced domestically.

- Establishing a narrow scope for patents, thereby encouraging local firms to licence foreign patents and undertake R&D leading to patentable improvements; and

- Encouraging the experimental use of patents by universities and other research institutes as allowed in terms of the TRIPs exception covering the non-commercial use of intellectual property.

227. In the medium term, developing countries may well be disadvantaged by the TRIPs agreement, but Governments can - and should - use its provisions and exceptions to foster the development of knowledge-based activities. The effects of TRIPs will be felt in all sectors where intellectual property rights (IPRs) are operative, especially in the chemical, pharmaceutical and biotechnology industries where the impact on developing economies is likely to be most significant. Undoubtedly, TRIPs will pose a major challenge to developing countries and transition economies, particularly in respect of technology upgrading.

Agriculture

228. The six-year phase-in period for the Uruguay Round Agreements in agriculture - extended to ten years in the case of developing countries - means that their impact will mainly be felt in the next century. In any event, the agriculture agreement will have only minimal implications for industrialization: it will mainly impact on trade in agricultural commodities rather than processed products, although there are important exceptions such as cheese and wine.

The impact on ACP States

229. Although ACP States comprise half the world's developing economies, their performance in terms of export volumes and market shares is insignificant. Indeed, their market share has more than halved from 6.7 per cent in 1976 to 3.1 per cent in 1993 (see Table 5.1). Preferential entry to the EU markets seemingly made little contribution to the industrialization process, with ACP exports of processed goods growing by only 4.4 per cent a year between 1976 and 1993, compared with 13 per cent for non-ACP developing countries. Over the same period, the ACP share of processed imports into the EU (excluding intra-EU trade) fell from 2.6 per cent to 1.1 per cent.[5/]

Box 5.2
The Lomé Convention

Some 97 per cent of exports from 70 African, Caribbean and Pacific (ACP) States - the bulk of them least developed countries - enter the EU market without restriction by any duty or non-tariff barrier. They are also exempt from export quotas imposed under the Multi-Fibre Agreement for clothing and textiles.

Since the creation of the European Economic Community, ACP exports have been subject to non-reciprocal preferences designed to encourage further processing of primary products and to boost industrialization. ACP States are guaranteed duty-free access for exports of manufactures as well as for a large proportion of their agricultural exports. Because EU tariffs escalate with value-added, preferences granted under the Lomé Convention are higher for processed and manufactured goods.

Free access is dependent on imports to the EU meeting the often complex rules of origin requirements, which specify that ACP exports must originate from within the region, although cumulation of inputs from ACP countries or EU member States is permitted. Thus, an ACP country importing raw materials or inputs from another ACP State or from the EU for processing or manufacture still satisfies rules of origin criteria.

The Lomé Convention stipulates that ACP exports should not be granted less favourable treatment than non-Lomé countries, which are entitled to preferential market entry under the Generalized System of Preferences (GSP). Over the years, however, ACP advantages have been partially eroded as the EU has extended preferences to other developing economies, including the economies in transition (i.e. eastern Europe and the Former Soviet Union).

continued

5/ UNIDO Background Paper, Adrian Hewitt, Antonique Koning and Michael Davenport: *The Impact of the Uruguay Round on ACP Manufactured Products* (ID/WG.542/16 (SPEC.)).

Box 5.2 (continued)

ACP States also benefit from GSP schemes offered by other industrialized countries, notably Japan and the United States, although these tend to be less favourable than the Lomé Convention in respect of product coverage and rules of origin (cumulation is not allowed). Preferences on clothing and textiles are subject to quota, while ACP schemes are time-bound and have therefore been less likely to encourage investment in manufacturing.

Caribbean ACP States also enjoy tariff- and quota-free entry to the United States market for most exports - although key exceptions include most apparel and textiles, leather goods (including footwear), canned tuna, petrol and petroleum products, and some agricultural items. Sugar exports are subject to United States quotas which vary from year to year. However, exports of such products to the United States under the Caribbean Basin Initiative (CBI) are subject to rules of origin whereby at least 35 per cent of value-added must be contributed by the country in question, although it may be cumulated over CBI countries, and up to 15 per cent may be imports from the United States provided that "substantial" transformation takes place in the CBI country.

The CBI is more advantageous than the GSP system of the United States since it is not time-bound and has more liberal rules of origin. Under a similar agreement with Canada (CARIBCAN), Caribbean ACP States enjoy quota- and tariff-free entry to the Canadian market (again with exceptions similar to those imposed under the CBI).

Source: Adrian Hewitt, Antonique Koning and Michael Davenport, *op. cit.*

230. No clear conclusions about the impact of preferences on ACP exports of manufactures emerge from the data, partly because ACP preferences on processed goods are usually shared by non-ACP exporters. In some cases, where the preference is limited to ACP States, it appears to have been effective - examples include rum from the Caribbean and canned asparagus from Lesotho, although in this latter case Lesotho has lost market share to eastern European suppliers in recent years. It may be that preferences that provide a competitive advantage over particular suppliers may not suffice once new players enter the market. It also appears that the advent of synthetic materials in twine production has undermined ACP and GSP preference margins, resulting in the loss of market share by suppliers such as the United Republic of Tanzania.

231. Rules of origin requirements discriminate against small countries - which find it difficult to generate local supplies of inputs - in particular. Opportunities for cumulation fail to compensate for this, leading to the conclusion that the threshold for non-originating inputs is too low.

Table 5.1. Shares of EU imports, 1976-1993, selected years
(Percentage)

	1976		1982		1988		1993	
	ACP	Other DCs	ACP	Other DCs	ACP	Other DCs	ACP	Other DCs
Processed food/drink	6.2	31.4	7.6	38.7	8.8	50.0	8.3	41.4
Chemicals, plastics products	1.2	5.0	0.6	7.0	0.4	11.9	0.3	10.8
Textile products, footwear	2.6	39.5	1.9	42.1	3.0	45.0	2.3	45.1
Metals, metal products	8.9	13.1	6.7	14.4	5.5	18.1	1.8	15.8
Other manufactures	0.2	8.2	0.2	10.3	0.8	15.0	0.5	17.3
Total processed	2.6	15.5	1.7	16.3	2.0	21.0	1.1	21.7
Total all goods	6.7	38.1	5.9	33.9	4.7	26.3	3.1	27.5

Source: COMEXT, Michael Davenport, Adrian Hewitt, Antonique Koning, "Europe's Preferred Partners: The Lomé Countries in World Trade", *ODI Special Report*, 1995.

Impact of the Uruguay Round

232. The reduction of MFN tariffs under the Uruguay Round and subsequent adjustment of GSP rates will divert trade away from ACP suppliers to other developing countries. ACP suppliers are also likely to suffer from the phasing out of the MFA agreement - from which ACP States are exempt in the EU market.

233. While non-ACP developing countries will benefit from the reduction of tariff escalation, ACP States, for whom escalation has not been a problem, will lose out as their advantage arising from exemption from tariff escalation is eroded. This will not have a material impact because their processed exports to the EU are so limited (Table 5.1), but it will make it marginally more difficult to export processed products in the future.

234. Preference erosion will be greatest in the EU market, where ACP exporters enjoyed their largest preferences (practically zero tariff) for manufactured exports. On the other hand, for the small range of manufactures that have not previously benefited from preferences - mainly in Japan and the United States - further liberalization might benefit ACP exporters.

235. Table 5.2 summarizes the Overseas Development Institute's (ODI) estimate of likely static losses resulting from ACP preference erosion. For 65 ACP States, the revenue loss is estimated at $317 million or 2.5 per cent of ACP exports of industrial products to OECD countries. Africa will be hit hardest, mainly in the metals and minerals sectors, but the biggest individual losers are in the Caribbean (Bahamas, Dominican Republic, Jamaica, Suriname, Trinidad and Tobago). In the Pacific, Papua New Guinea will suffer significantly in the metals and minerals sectors.

Table 5.2. Static losses resulting from ACP preference erosion
(Quantitative estimates, $ million)

	Metals, minerals	Wood, pulp, paper	Leather footwear	Chemicals	Elect. equip.	Non-elect. equip.	Transport equipment	Other industrial	Imports 1992,	Revenue change[a]
Africa	-60.9	-36.1	-0.4	-10.9	-2.9	-3.7	-6.6	-54.4	8,222.4	-175.8
Caribbean	-7.5	-0.3	-6.5	-27.9	-11.6	-1.7	-5.2	-59.3	3,366.3	-120.0
Pacific	-4.3	-5.8	-0.2	0.0	-1.4	-0.1	0.0	-2.4	659.3	-14.2
ACP (65)	-78.7	-42.3	-7.2	-39.0	-15.9	-5.5	-12.1	-116.3	12,766	-317

Source: Michael Davenport, Adrian Hewitt, Antonique Koning, *"Europe's Preferred Partners: The Lomé Countries in World Trade", ODI Special Report*, 1995.
a/ Figures do not always add because of rounding.

236. Revenue declines are concentrated among ten ACP States, which account for 55 per cent of total losses, although in no case does the estimated loss exceed 5 per cent of industrial exports. As a proportion of total ACP exports to the world, the preference erosion loss on industrial products is tiny, at 0.6 per cent. This is because a large proportion of ACP exports already enter OECD markets free of tariffs for all suppliers.

237. Table 5.3 summarizes the likely impact of Uruguay Round changes on ACP exports, and suggests a total loss of 1.3 per cent of 1992 exports, which totalled $53 billion. The $317 million predicted decline in industrial exports accounts for 44 per cent of the overall loss of $713 million.

Table 5.3. Summary of the Uruguay Round settlement
(Trade effects; $ million and share of 1992 exports from the ACP to OECD countries)

	Change in net exports of temperate agricultural products	Change in revenue from exports of tropical products and fish	Change in revenue from exports of industrial products[a/]	Total change in exports	1992 exports to the rest of the world	Total change as percentage of total exports
Africa	-173	-156.3	-175.8	505.3	44,689	-1.1
Caribbean	-52	-11.0	-120.0	-183.1	6,109	-3.0
Pacific	-2	19.3	-14.2	-25.0	2,390	-1.1
ACP	-227	-176.6	-317	-713.4	53,188	-1.3

Source: Michael Davenport, Adrian Hewitt, Antonique Koning, Europe's Preferred Partners: The Lomé Countries in World Trade, *ODI Special Report*, 1995.
a/ Excluding textiles and clothing.

238. The global clothing industry can be expected to become far more competitive following the eventual abolition of the MFA, with substantial market opportunities for producers enjoying significant comparative advantage. But because they were not subject to MFA controls, ACP producers of clothing and textiles will be "hard-pressed" to benefit; rather, the highly competitive Asian manufacturers will gain most. At the same time, significant African ACP exporters (Lesotho, Madagascar and Mauritius) facing "intrinsic" comparative advantage and whose market share has been achieved by exploiting Lomé preferences may well be hit by the phasing-out of the MFA, while recent market entrants, like Zimbabwe, will also find it difficult to compete with the Asians. In the Caribbean, suppliers like Jamaica and some of the smaller islands are also likely to lose share, while Haiti, the only Caribbean exporter with a cost advantage, might manage to maintain its position. Page and Davenport expect the main losers among ACP States to be Jamaica and Mauritius, with losses of 7.6 per cent and 16.5 per cent of 1992 exports respectively, but for the ACP group as a whole, the impact will be extremely marginal, at 0.2 per cent of total revenue.[6/]

239. However, small ACP States such as Benin, Burkina Faso, Chad and Mali, which produce cotton, are potential exporters of clothing and textiles and currently depend for a significant part of their export earnings on sales to the EU of basic textiles, which are not subject to the MFA, might suffer from preference erosion. It will be more difficult to attract the sectoral investment that would enable these countries to move upmarket to higher value-added products.

240. ACP States should indirectly benefit from the Uruguay Round's expected positive impact on global economic growth, world trade and investment. There will also be gains from improved access to non-EU markets, while reduced developing-country tariffs will offer opportunities for increased trade between developing countries.

Industrial policy implications

241. Some industrial policy implications are as follows:

(a) The Uruguay Round's anti-subsidy provisions will seriously constrain subsidies that lower export prices. While explicit export subsidies or cost-reducing production subsidies to exporters are banned, Governments will still be able to provide indirect support in the form of pre-production R&D, international marketing assistance, and training and education programmes;

6/ Sheila Page and Michael Davenport: *World Trade Reform: Do Developing Countries gain or lose? ODI Special Report* (1994).

Box 5.3
The future of Lomé

It is accepted that the EU will not be able to offer ACP States the same exclusive and discriminatory treatment in any successor arrangement to Lomé IV.

Three possible scenarios are envisaged:

- The retention of Lomé IV, although with the abolition of non-reciprocal treatment for some of the more developed ACP States, such as the Bahamas. This could be justified on the grounds that more advanced ACP States should no longer require such preferential treatment, nor should they be accorded the same advantages as the least developed countries (LDCs). This would reduce the ACP group to the least developed African economies, which are most vulnerable and most dependent on trade with the EU.

- Globalization of the Lomé Convention with a focus on the world's least developed countries, including a handful outside Africa (such as Bangladesh, Laos); this implies that not all African countries, but only the least developed, would be targeted.

- The establishment of free-trade areas linking ACP States with the EU. ACP States would be encouraged to set up regional free-trade areas that would then negotiate barrier-free entry to the EU. Such an initiative might act as a catalyst for greater LDC regional economic integration, which has made very little progress thus far.

(b) The Uruguay Round was the first in which large numbers of developing countries played an active role. Their decision to accept tariff binding limits the scope for future use of tariffs to protect infant industries, although in many cases developing countries have bound their tariffs at rates higher than those currently applicable, thereby leaving themselves some room for manoeuvre;

(c) ACP States and other less developed countries need to become less reliant on preferences and instead build greater competitive advantage by giving increased priority to trade development. This would necessitate varying degrees of industrial restructuring in subsectors and niche areas, and local enterprises, having export potential. Improved infrastructure, especially transport and telecommunications, and the creation of effective export promotion organizations should be high on the policy agenda, along with more outward-looking trade policies. Increased private-sector involvement in trade policy formulation is also desirable;

(d) In the light of the close correlation between FDI, technological upgrading and export competitiveness, the least developed countries need to step up their efforts to attract foreign investment. Mauritius' success in attracting Asian investors offers lessons for other developing countries;

(e) ACP States need to participate more actively in international economic and financial institutions and diplomacy. By July 1995, only 34 out of 70 ACP States had joined the WTO, while only 12 of them had ambassadors in Geneva.

(f) Improved market research information is crucial for export growth. International agencies have a role to play in improving market information, although the best solution is often a joint venture or some non-equity relationship with wholesale or retail distributors in target markets.

Economies in transition

242. The clothing and textile sectors in the countries in transition - most notably the former Soviet Union, Bulgaria, the Czech Republic and Slovakia - will benefit from the phase-out of the MFA. Enterprises in countries such as the Czech Republic, Hungary, Poland, Romania, and Slovakia, which appear to have a comparative advantage in manufacturing and semi-manufacturing will also benefit from enhanced access to industrialized country markets. At the same time, increased and more secure market access should also foster FDI and non-equity links.

243. The opening-up of markets in eastern Europe is expected to have a material impact on industry location decisions. Lower labour costs - than in the OECD countries - and the relative abundance of unskilled and semi-skilled personnel could create a competitive advantage platform for some of the transitional economies. The dismantling of trade barriers could encourage western enterprises to take advantage of the gains from outward processing trade (OPT) by subcontracting the manufacture of selected items to eastern European firms. OPT trade of this kind has developed with eastern European firms exporting textiles, clothing and footwear to western Europe.[7/]

Regional integration

244. Resurgent enthusiasm for regional economic integration among emerging economies is not justified by past failures, and there is no case where a regional integration scheme has contributed materially to the evolution of a developing country.[8/]

245. Regional integration has been primarily an industrialized-country phenomenon, centred in western Europe. Of the 109 agreements notified to GATT between 1948 and 1994, western European countries were partners in 76 instances. An important recent

---

7/ UNIDO, *Industrial Development, Global Report, 1995.*

8/ Augusto de la Torre and Margaret Kelly, *Regional Trade Arrangements*, IMF Occasional Paper 93, March 1992.

development, however, is the growing participation of central and eastern Europe. Indeed, no fewer than 24 of the 33 agreements notified to GATT since 1990 were concluded between western European countries on one hand and the economies in transition on the other.[9/]

246. The fact that the world's two largest trade markets - the EU and North America - are increasingly conditioned by regional trade agreements is creating the spectre of a world economy divided into three major regional trading blocs: North America, the EU, and a Far Eastern cluster centred on Japan.

247. In this situation, developing countries and the countries in transition are re-examining their strategies. Some non-members will try to join existing clubs - NAFTA or the EU - while others will be tempted to set up new regional trade associations in an effort to strengthen their bargaining power *vis-à-vis* North America and the EU.

248. Regional integration appeals to developing countries on four main counts:

- As a means of enhancing economic growth and industrial efficiency through improved resource allocation.
- As a defence against the regional trade blocs established by industrialized countries.
- As a way of accelerating the expansion of manufactured exports.
- As a vehicle for generating critical mass so that enterprises can exploit economies of scale and experience effects and improve their global competitiveness.

249. However, few regional integration agreements reached by developing countries have met their original timetables for the establishment of a free trade area or customs union. On the whole, they have proved to be largely disappointing avenues for development owing to the absence of wide sectoral coverage that limited the potential gains to member States from trade liberalization. Since the start of the Uruguay Round, the developing countries especially in Asia and Latin America, have renewed their interest in such agreements as outward-oriented economic reform programmes transformed the policy environment making it more conducive to the achievement of regional integration objectives.

250. With the demise of the Council for Mutual Economic Assistance (CMEA) and the disintegration of the former Soviet Union, the countries in transition faced the loss of markets for their exports along with sources of raw materials and other inputs. This coincided with the breakdown of established trading and production arrangements, forcing them to focus attention on developing new trade relationships with each other while also seeking closer links with the developed market economies, especially the EU. In December 1992, the Czech Republic, Hungary, Poland, and Slovakia,established the Central European Free Trade Agreement, to set up a free-trade area by the end of 1997. A number of European countries (Switzerland, Finland, Norway and Sweden) have

---

9/ World Trade Organization: *Regionalism and the World Trading System*, Geneva, April 1995.

signed free-trade agreements with each of the Baltic States, while in 1994 the EU also signed free-trade agreements with the Baltic countries.

Replicating the EU model will be difficult

251. The success of market integration in the industrialized world - and notably the EU - will be difficult to replicate among developing countries. Small markets, low per capita incomes and similar factor endowments, and the resulting similarity in production structures, inhibits trade expansion arising from intra-industry specialization and product differentiation. In the EU, by contrast, intra-industry trade is fostered by large markets, high income per head and product differentiation. It is considered that developing countries may, more advantageously, seek gains from trade based on different resource endowments and production structures. Such an approach would be better served by unilateral and multilateral liberalization.[10/]

252. A 1993 OECD study[11/] evaluating the performance of 12 well-established developing-country regional groupings encompassing 77 countries in three geographic regions - sub-Saharan Africa, Asia, and Latin America and the Caribbean - concludes that "the overwhelming result of their collective experiences (except for in Asia) has been, up to now, a low level of economic integration." Despite this however, it is still considered that regional integration is an important tool for economic development; and/or that regional integration continues to be desirable for developing countries in various regions.

253. The main reasons for the failure - thus far - of developing-country economic integration were:

Political

Specific problems include:

- A lack of commitment;

- The inability of member States to put regional goals before national ones;

- The tendency to resort to unilateral, restrictive trade measures when trade liberalization created pressures for domestic adjustment or when economies suffered from exogenous shocks;

- An inability to come to mutually acceptable terms over the distribution of costs and benefits. For many Governments the surrender of national sovereignty is incompatible with national development;

10/ D. Greenaway and C. Milner, "South-South Trade—Theory, Evidence and Policy", *The World Bank Observer*, 1990.

11/ OECD, *Regional Integration and the Developing Countries*, 1993.

- The built-in administered bias favouring non-regional products over regional ones since non-regional imports are invariably seen to be of better quality, while regional imports are inferior to the domestic product;

- Cultural differences, including deeply rooted differences in political ideologies and social customs, that have exacerbated the negative experience of regionalism; and

- The failure of policy makers to adopt a regional strategy when other potentially more effective means of pursuing economic objectives were available.

Economic

The ineffective performance of regional cooperation arrangements is also attributed to:

- The inability of Governments to find new sources of revenue to replace income lost from customs duties when tariffs are lowered;

- Differences in initial conditions such as disparate levels of income and different stages of industrial and economic development;

- A low level of initial integration, implying that members had little to trade. For many groups, trading interests lay mainly outside the region, so that even where regional trade barriers were lowered there was little inducement to shift trade patterns - *i.e.* there was little trade creation;

- In many instances, similarities in resources and production structures failed to boost trade even when barriers were reduced;

- Import substitution policies, non-tariff barriers (NTBs) and other market distortions designed to ensure the survival of inefficient domestic industries were left in place in some member States;

- Intra-regional barriers remained, thereby inhibiting the free flow of factors of production;

- Macroeconomic imbalances made adjustment, both domestic and to integration, even more onerous; and

- Exogenous shocks such as commodity price declines, drought, higher real interest rates in global markets.

Disappointing intra-regional trade growth among developing countries

254. Confirming these findings, the World Trade Organization concludes that the European Union is the only region to show a "clear policy-induced increase in the relative importance of intra-regional trade". Table 5.4 shows that in western Europe the share of intra-regional trade increased from 53 to 70 per cent between 1958 and 1993 with most growth taking place between 1958 and 1973. In Asia and Latin America, the

share of intra-regional trade also increased, though to a smaller extent, while in other regions, its importance was largely unchanged or even declined. The most outstanding example being the de-regionalization of trade in central and east Europe.

Table 5.4. Share of intra regional trade (exports plus imports) in total trade in seven geographic regions, 1928-1993
(Percentage of each region's merchandise trade)

Years	1928	1938	1948	1958	1963	1973	1983	1993
Western Europe	50.7	48.8	41.8	52.8	61.1	67.7	64.7	69.9
Central and Eastern Europe and the former Soviet Union	19.0	13.2	46.4	61.2	71.3	58.8	57.3	19.7
North America	25.0	22.4	27.1	31.5	30.5	35.1	31.7	33.0
Latin America	11.1	17.7	20.0	16.8	16.3	27.9	17.7	19.4
Asia	45.5	66.4	38.9	41.1	47.0	41.6	43.0	49.7
Africa	10.3	8.8	8.4	8.1	7.8	7.6	4.4	8.4
Middle East	5.0	3.6	20.3	12.1	8.7	6.1	7.9	9.4

Source: WTO, *Regionalism and the World Trading System, 1995*, p. 39.

255. At the same time, however, the EU's increasing openness to international trade has largely maintained the importance of extra-regional trade in relation to output, which fell modestly from 15.8 per cent in 1958 to 12.8 per cent in 1993.

256. Unfortunately, few meaningful conclusions can be drawn from the successful EU experience, which is unique because of its political commitment to carry integration well beyond the limits of conventional customs unions or free-trade areas.[12]

The revival of regionalism

257. Despite these broadly negative assessments of past experience with regional integration amongst developing economies, there has, since 1990, been a surge in new regional integration agreements notified to the GATT: 33 between 1990 and 1994. "The appeal of regional integration shows no sign of abating, and the issues raised by the interaction between regional integration agreements and the world trading system are unlikely to disappear from the international policy agenda".[13]

12/ WTO, *op. cit.*, page 55.

13/ *Ibid.*, page 1.

258. It is clear, however, that if existing (and proposed) regional integration arrangements are to perform better in the future, substantial reforms will be required, including :

(a) A strong and sustained political commitment. Experience shows that initial enthusiasm for integration can dissipate rapidly;

(b) Effective mechanisms to distribute more equitably the costs and benefits of integration;

(c) The freeing of regional trade as a complement to overall trade liberalization. Import substitution is no more effective at regional than at national levels;

(d) Macroeconomic stability: instability slows or even reverses the integration progress;

(e) Structural flexibility: structural rigidities, often the aftermath of import-substitution industrialization, reduce the potential gains from integration;

(f) Design of better agreements ensuring the inclusion of virtually all trade in goods and services, removal of tariff and non-tariff barriers to intra-regional business and the inclusion of provisions covering investment.[14/]

259. On the whole, the more negative assessments have more to do with the implementation of regional integration arrangements than their underlying logic. While a revival of inward-oriented integration schemes designed to foster regionally based, import-substitution industries, allocated among member States by political decision, may not be successful or desirable, there is plenty of evidence to demonstrate that regional and multilateral trade agreements are complementary rather than competitive paths to a more open global trading system.[15/]

260. A retreat into "fortress-style" regional agreements is unlikely; so powerful are the forces of globalization and so intense the competition to become part of the system rather than risk being left behind that outward-looking economic unions will be preferred as and when political obstacles are overcome. Such regional arrangements, designed to attract FDI and other globalization links on the basis of a larger domestic market, while simultaneously increasing the bargaining power of groups of developing countries through collective action within an integrated global economy, offer the opportunity to replicate the EU and NAFTA models more successfully.

14/ OECD, *op. cit.*, 1993.

15/ WTO, *op. cit.*, p. 62.

CHAPTER 6. THE CHANGING ROLE OF INDUSTRIAL POLICY IN DEVELOPING COUNTRIES

261. National economic policies are becoming less effective as economies are liberalized and decontrolled and nation States become more interdependent economically. At the same time, economic policy has converged on the middle ground as policy makers eschew extreme interventionist or free-market solutions.

262. While there is more disagreement about industrial than macroeconomic policy, where a clear consensus has emerged, the debate on industrialization strategies has shifted decisively over the past decade. The disagreements of the 1970s over inward-looking versus outward-oriented industrial policy have been replaced by a dialogue over the most effective strategies for building competitive advantage at a time of accelerating technological progress, global liberalization and heightened market competition.

263. The difficulties inherent in designing strategies appropriate for a rapidly changing global business environment, especially at a time when policy is being marginalized to some degree by the globalization process, cannot be exaggerated. As Governments liberalize, privatize and deregulate, both the range and number of their national policy options are reduced. Furthermore, government policies designed to foster specific sectors or industries become less relevant as regional economic interdependence grows.

264. "The economic interdependence being created by the burgeoning economies of Hong Kong, Taiwan Province of China and other parts of China are the most obvious examples. Other examples of open economic associations are the 'growth triangles' around Singapore, the increased interaction between China and the Republic of Korea and the production networks being created all around the Asian-Pacific region by investment from northeast Asia".[1/]

265. Against this background, the nature and role of industrial policy are changing; the Uruguay Round Agreements limit the use of tariff and non-tariff measures to protect infant industries; TRIMs restrict the use of trade-related measures to influence the pattern of FDI; growing crossborder linkages and vertical integration, and the availability or otherwise of skilled labour exert a greater influence over industry location decisions than government fiscal incentives.

266. Policy makers have responded in four main ways:

- Industrial policy has shifted "upstream" away from interventions designed to protect and promote a specific industry or sector to more general strategies aimed at boosting economy-wide competitiveness indirectly - increased investment in infrastructure, education and R&D, improved transport facilities, greater support

---

1/ Heather Smith. "Industry Policy in East Asia", *Asian-Pacific Economic Literature*, Vol. 9, No 1, May 1995.

for technology development and technological transfer along with a broader and more efficient range of industry-related service activities.

- A general shift away from inward-focused intervention in support of industries serving the domestic market towards enterprises targeting export markets;

- Greater emphasis on regional objectives - policies designed to help backward regions within a country, or backward countries within a region, such as the European Union; and

- Greater selectivity in the form of increased emphasis on industrial strategy and industrial promotion at micro level, including the restructuring and privatization of existing enterprises (particularly important in the countries in transition and in those developing economies with large public sectors) and support for SMEs - possibly the area with the most potential for growth and therefore for industrial intervention in developing countries.

The search for an East Asian "model"

267. Recently the industrial policy debate has focused on the extent and manner in which developing economies as a group can replicate the East Asian model of rapid, sustained, industrialization-driven economic growth. The challenges are formidable; for a start there is no single, unique East Asian model for all to follow, nor is there unanimity among researchers and policy makers as to the extent to which government intervention was responsible for the East Asian achievements. Furthermore, policies that succeeded under different global market conditions in the 1970s and 1980s may no longer be appropriate.

268. That East Asian regimes were interventionist is acknowledged, although the contribution of industrial policy interventions to their success remains highly controversial. Conflicting interpretations of the East Asian experience are further blurred by the changed global business environment and the rapid pace of technological change, which may have overtaken strategies that were successful in East Asia in the 1970s and 1980s.

269. Accordingly, the advice that industrially less developed countries should choose East Asia as their role model begs a number of questions. While there was a common background of export-led growth and heavy investment in human capital, underpinned by strong regional spillover and cluster effects from other countries in the region, NIEs played their cards in various ways. Each used different policies, relying on foreign direct investment (FDI) to varying degrees: the Republic of Korea followed the Japanese into large-scale, capital-intensive activities (such as steel, automobiles and ship-building), Taiwan Province of China relied on smaller firms in most sectors, and both Hong Kong and Singapore were initially entrepôt exporters. (Box 6.1)

The home base matters

270. One growth path open to some developing countries is that of globalized production under the aegis of TNCs, but this route will not be available to the many small LDCs that are unable to attract sizeable FDI inflows. This may not also be the preferred route in countries with strong and dynamic private-sector groups who would like to retain their autonomy but would be glad to benefit from technological, marketing and other linkages with foreign enterprises. In any event, there is far more to attracting FDI than deregulation and liberalization. Globalization thrives only where infrastructure, skills, supplier systems and clusters of supporting and related industries are available (Box 6.2).

271. Foreign investment cannot displace indigenous developn.ent - "the existence of a dynamic and competitive domestic industrial sector itself attracts 'higher-quality' foreign investment and allows the host economy to reap much larger benefits from it."[2/]

272. At a time of accelerating globalization, it is essential that the crucial role of the "home base" in the industrialization process is fully recognized. Industrial development cannot be imposed from abroad; indigenous industry capability and productive systems are essential to long-term industrialization.

273. "The home base shapes a company's capacity to innovate rapidly in technology and methods and to do so in proper directions. It is the place from which competitive advantage ultimately emanates and from which it must be sustained".[3/]

Box 6.1
Hong Kong and Singapore: Different strokes, contrasting styles

The lessons of the Hong Kong industrial "miracle", often cited as a model for small, resource-poor LDCs, are ambiguous. The British colony enjoyed unique initial conditions - a long entrepôt tradition with global trading links, an established trade and finance infrastructure, the presence of large British companies and the influx of skilled entrepreneurs from mainland China.

These unique qualities enabled it to develop export-oriented light manufacturing industries in a free-trade environment - an achievement that no other country has managed to replicate.

continued

2/ UNIDO Background Paper, Sanjaya Lall. *Governments and Industrialization: The Role of Policy Interventions* (ID/WG.542/23 (SPEC.)).

3/ Michael Porter, *The Competitive Advantage of Nations*, 1990, p. 577.

Box 6.1. (continued)

However, the island has failed to progress in terms of industrialization, remaining heavily reliant on relatively low-technology labour-intensive manufacturing with little technological upgrading (Chapter Four). Since the mid-1980s, Hong Kong has experienced massive de-industrialization, losing more than one-third of manufacturing employment between 1986 and 1992, and relocating much of its manufacturing elsewhere in the region, especially mainland China. Its geographical location and other unique features have fuelled continued growth but it is hardly a role model for least developed countries which are unable to exploit the island's unique comparative advantage.

Singapore took a different road, employing a combination of selective intervention and free trade. With half the population level of Hong Kong and higher wage levels, it deepened its industrial structure, resorting to targeted interventions to attract FDI inflows. After a brief period of import substitution, it changed tack, switching to export-oriented growth that was heavily reliant on TNC investment. TNCs were induced to invest in higher value-added activities, while the Government intervened to create the specific skills required, establishing publicly owned enterprises to spearhead industrial progress where FDI was deemed unfeasible or undesirable.

Source: UNIDO Background Paper, Lall, *op. cit.*

Box 6.2
Strategic versus competitive advantage

Ultimately, it is firms, not countries or Governments, that create competitive advantage. It is enterprises that manufacture and market goods and services, and the well-documented case of Japanese automobile transplants in the United States outperforming their United States counterparts in the late 1980s, while subject to the same comparative advantage conditions, highlights the crucial contribution of strategic advantage to performance. The home base is crucial. "Differences in national economic structures, values, cultures, institutions and histories contribute profoundly to competitive success. The role of the home nation seems to be as strong or stronger than ever" (Michael Porter, *"The Competitive Advantage of Nations"*, p. 19).

continued

Box 6.2. (continued)

Enterprises build competitive advantage in three main ways:

- By producing and selling acceptable quality products at lower prices than their rivals—a cost-leadership strategy;

- By producing better-quality otherwise or superior products and services that are different or unique to the extent that they better satisfy consumer preferences than rival products—a differentiation strategy; or

- By securing niche or focus markets for their products, thereby meeting a consumer demand neglected by other suppliers.

Globalization implies using one - or possibly more - of these three generic competitive strategies to secure advantage internationally. It means that national boundaries no longer confine an industry to a specific national location. Instead, firms break up the value-added chain of their activities across national boundaries, establishing networks of parts and component producers in different countries, supported by R&D facilities, assembly plants, data-processing, finance and marketing offices. Value-adding facilities are located where the enterprise maximizes efficiency.

Crossborder vertical integration of this kind brings together comparative and strategic advantage. National comparative advantage - the availability of low-cost labour or energy, a rich natural resource base, a well-developed, well-maintained physical infrastructure, a cluster of supportive supplier firms, a competent bureaucracy, a strong education system and consistent policies to maintain macroeconomic stability - will influence and determine how and where TNCs locate different value-adding activities.

Global competitiveness is therefore two-tier in nature, requiring a blend of national (comparative) advantage and enterprise-driven, strategic advantage. Industry-level competitiveness in global markets invariably depends on a combination of the two. Even in globalized industries - and not all industries are global - the home base, and with it national economic policy, is of major importance.

A case for selective interventions

274. In the mid-1990s, the issue is whether the "neo-liberal rules of the game", appropriate though they may be for OECD economies, meet the needs of developing countries and especially the least developed economies, whose home bases fall far short of the platform necessary for FDI-driven industrialization.

275. The neo-liberal view holds that:

- Markets are basically efficient and Governments basically inefficient;

- Resource allocation is optimized by responses to free markets; and

- The best industrialization policy is one that eliminates all interventions in the functioning of markets.[4/]

276. A distinction can be made between functional interventions, designed to remedy market failure without favouring any one activity over another, and selective interventions, which do discriminate in favour of a particular activity or industry. The World Bank has argued that functional non-discriminatory government intervention, designed to correct generic market failure, is essentially market friendly, and therefore justified under certain circumstances.[5/]

277. The World Bank supports three kinds of intervention classified as functional and market-friendly:

- Support for human capital formation by investment in education and health;

- Policies to open up economies to technology inflows from abroad; and

- Export promotion, justified by the conviction that export activities create beneficial externalities.

278. However, this approach is questioned:

- The **structuralist** claim that East Asian Governments anticipated shifts in comparative advantage, using selective interventions to promote new export industries, as well as by

- The **strategic trade** assertion that East Asian Governments intervened to foster industries that benefited from externalities which created new sources of comparative advantage and accelerated economic development.

279. These two aspects pinpoint the shift in the debate over industrial policy; today there is little enthusiasm anywhere for old-fashioned, import-substitution protectionism. The new interventionism has its origins in strategic trade policy in the form of measures designed to foster export-led development via enhanced competitiveness rather than the protection of inefficient and inward-focused operations.

4/ UNIDO Background Paper, Lall, *op. cit.*

5/ World Bank, *The East Asian Miracle: Economic Growth and Public Policy*, (1993).

Market failure

280. Arguably, any policy that remedies market failure is, by definition, market friendly; East Asian experience shows that selective intervention was effective, while evidence from other regions suggests that the failure to remedy market failure has constrained industrialization. In any event, the distinction between functional and selective intervention has been overdrawn. Functional intervention in the form of fostering investment in human capital at schools and universities may be non-selective, but the moment the emphasis shifts to vocational, technical or managerial training, as in some East Asian countries, it becomes selective.

281. Market failure takes three main forms:

- within firms,
- in inter-firm relations, and
- in factor markets.

282. Because such failures are inter-related, they are best tackled by a combination of both functional and selective interventions. Those within firms should be dealt with by providing a temporary cushion, while concurrently providing information and other support.

283. Those between firms need to be tackled by the coordination of investments (again partly by protection) while promoting linkages and geographical clustering.

284. Those in factor markets may require direct intervention at source. Protection, used on its own, meets only part of the challenge and can be harmful for technological development because it leaves other failures untouched.

Policy recommendations

285. "The process of economic liberalization should be a gradual and controlled process of opening up accompanied up by a strategy of industrial restructuring and upgrading, rather than the rapid and sweeping exposure to international market forces".

286. This does not mean slowing down the adjustment process. Rather, it means using a grace period not to delay adjustment but to actively prepare for it. Industrial policy must conform with market forces rather than working against them, but this does not imply "the wholesale withdrawal of Governments from markets and resource allocation". Industrial strategy should be conceived of as the vehicle for enhancing competitiveness, using a targeted approach, since resources and capability will be limited. Policy should include:

- Tracing the competitive evolution of a country's industrial sector;

- Identifying potential industry clusters that can be promoted with the limited resources available;

- Selecting new areas of competitiveness - and identifying losers - and implementing appropriate policies to improve competitiveness; and

- Strengthening the information, administrative and human resources needed to undertake such policies. This includes organizational reform of Government.

287. While liberalization of the trade regime is the most important incentive reform to be undertaken, the approach should be gradualist and selective rather than sweeping and non-discriminatory. Not all industries that are uncompetitive today are necessarily permanently so. Undoubtedly, some industries may close down, but others - and possibly the bulk of a country's manufacturing sector - may well become globally competitive if they are given time to "relearn" and develop new capability.

288. In opening up the economy, Governments should retain the power to influence resource allocation in a clear and transparent manner. This is very different from the traditional import-substitution model, where the carrot of across-the-board protection was available without the stick of a phase-out period after which firms knew they would have to face international competition (Box 6.3).

Lessons of experience

289. The lessons of experience are as follows:

- Interventions should be closely coordinated and integrated. Uncoordinated intervention in factor markets without appropriate measures in product markets will be ineffective or even counter-productive.

- Distortions caused by interventions must be offset. Protection must be combined with competitive pressures to enter export markets.

- Because resources are limited, only a few activities should be supported at any one time. Targeting is crucial.

- Incremental measures and modest technological advances are preferable. Learning is cumulative and intervention must support activities that have a base in existing skills.

- The successful East Asian NIEs resorted to both selective and functional interventions to accelerate industrialization. Industrial and technological deepening was achieved via selective intervention.

- Export orientation imposed strict discipline on both industry and Government, forcing State officials to develop and implement appropriate interventionist strategies.

- FDI was treated differently in the successful East Asian countries. Those wishing to promote indigenous technology intervened to limit foreign entry, while those that opted to rely on TNCs intervened to target new investors, inducing them to

set up more complex operations than they would otherwise have done. The Republic of Korea and Taiwan Province of China, which developed the most diverse, deep and technologically dynamic indigenous industrial sectors, placed the least reliance on FDI. They used foreign investment selectively while promoting indigenous skills and technology.

- Policy varied with the size of the economy; the larger countries with greater scope for internal specialization and local content, as well as a broader indigenous base, intervened selectively to spread technological development more widely among domestic business. The smaller States with a weak indigenous sector and tiny home market were more reliant on FDI.

Box 6.3

The Republic of Korea: Using the *chaebol* to foster technological upgrading and diffusion

East Asian countries that developed the most diverse and technologically dynamic indigenous sectors (i.e. the Republic of Korea and Taiwan Province of China) placed the least reliance on FDI. In the Republic of Korea's case, one reason for this was the country's enormous success in creating large private-sector conglomerates, termed *chaebol*. These were "hand-picked from successful exporters and given a range of subsidies and privileges, including the restriction of TNC entry, in return for furthering the strategy of setting up capital- and technology-intensive activities geared to export markets".

However, the conscious decision to foster large firms such as Daewoo, Hyundai, Samsung, Goldstar - which could command greater access to capital, skills and technology, and which accounted for one-third of the country's exports in 1988 - should not be confused with a "national champion" strategy. Whether by chance or design, intense rivalry pervaded almost every successful Korean industry. "At least four or five companies compete in every significant industry, often including a subsidiary of each of the leading *chaebol*. A pioneer makes the initial entry but other competitors soon follow" Indeed, competition has been so fierce that on occasion the Government has been forced to intervene to prevent "destructive" rivalry.

Government legislation required the *chaebol* to subcontract parts and components to small and medium-sized enterprises (SMEs) rather than manufacturing them in-house. This achieved far greater technological diffusion than would otherwise have occurred. By 1987, some 1,200 items were designated for subcontracting to more than 2,000 mainly SME suppliers.

continued

Box 6.3 (continued)

The *chaebol* also performed the crucial role of investing heavily in new technology. Their size allowed them to develop their own R&D, set up world-scale facilities, and create their own brand-names and distribution network. The *chaebol* commitment to building their own brand-names and product models for export markets was "a unique feature of many Korean companies". However, their "awesome willingness to take risk" was even more notable.

The *chaebols*' success as diversified conglomerates contrasts starkly with the unpopularity of conglomerate diversification in Western industry, and its restructuring around core activities and competencies. Whether the *chaebol* model is appropriate for the new competition of the twenty-first century is problematic. Similarly, it is unclear whether developing countries could - or should - seek to replicate the *chaebol* experience, especially in the case of small, least developed economies, where such a strategy might all too easily give rise to complacent, monopolistic conglomerates unable to develop global competitive advantage.

Sources: UNIDO Background Paper, I all, *op. cit.*, and Porter, op. cit.

290. The experience of Chile and Ghana provide interesting contrasts to the successful East Asian economies. In Chile, despite stable growth, skills upgrading and technology intensity did not develop at the same pace as in the East Asian NIEs and though agro-based activities were the source of strong export growth, the country was unable to develop labour-intensive, low-price exports, or to upgrade technologically and develop new, higher value-added exports. In Ghana, de-industrialization took place as imports were liberalized. "... The long period of import-substituting industrialization, with the lead taken by State-owned enterprises, left a legacy of inefficiency and technological backwardness". Foreign investment did not increase after adjustment, other than in commodities (mainly gold mining), nor did the hoped-for surge in domestic investment materialize to upgrade manufacturing industry.

291. Ghana's reforms, mirrored in other adjusting countries in Africa, have left a truncated manufacturing sector dominated by firms enjoying "natural" protection from imports - these take the form either of very small businesses manufacturing low-income products for the local market or a handful of larger firms processing domestic raw materials or being protected by high transport costs. One analyst concludes, gloomily, that: "The rapid pace of exposure to world competition is killing off not just inherently uneconomic activities, but also some that could be the basis of new labour-intensive manufactured exports".

Supply-side measures

292. Industrial policy should also include measures to enhance domestic competition and eliminate biases against small- and medium-sized enterprises (Box 6.4). The main constraint on industrial development is likely to be scarce human, technical and managerial capital. Structural adjustment programmes have been weak in that liberalization has proceeded at a pace that runs ahead of the economy's capacity to provide the new skills and core competencies required by industry.

293. Obvious areas for intervention are training, skills development and technological upgrading. In the United Kingdom it costs on average £50,000 for a firm to introduce ISO 9000 quality-management systems - a sum well outside the scope of small firms in developing countries. It may be necessary for Governments to promote and subsidize such programmes along with extension services to industry.

Obstacles

294. Obstacles to this approach should not be overlooked.

- Reinforcing the role of the State in the face of global forces of liberalization, deregulation, privatization and globalization will not be easy, and will run the risk of deterring foreign investors. Many of yesterday's interventionist practices are no longer viable in the light of the Uruguay Round Agreements and liberalized global financial markets. Suggestions that Governments restrict technology inflows in order to foster domestic technological capability imply that the implementors of technological progress - entrepreneurs - will be able to compete in global markets, despite a widening technology gap. The fact is that developing countries need to run even faster than industrialized States at a time when technological progress is accelerating. The example of Singapore indicates the advantages of the FDI route to technological development (Box 6.5).

Box 6.4
Clusters and industrial districts: A strategy for SME development

In developing economies, export-led industrial growth is often associated with large firms, including affiliates of transnational corporations. The challenge of the late 1990s is to broaden the process so that small and medium-scale, usually labour-intensive, firms increasingly participate in the export of manufactures. One possible route is the so-called Italian or Emilian model, in which clusters of small firms have been highly successful in the production and export of traditional manufactures such as shoes, leather goods, musical instruments, tiles and even machinery.

continued

Box 6.4 (continued)

The Italian experience, which shows that small firms can export shoes and textiles successfully without depending on low-cost labour, offers a blueprint that developing and least developed countries could adapt to their advantage via the promotion of "industrial districts", defined as:

- Clusters of geographically concentrated and sectorally specialized SMEs;
- Firms sharing a common cultural and social background;
- Networks of forward and backward linkages with suppliers and distributors; and
- Clusters supported by Government and private-sector institutions.

The underlying logic is that clusters of predominantly small firms can secure scale and scope economies, share learning and experience effects and increase flexibility through inter-firm cooperation and specialization. "If they cluster, they can be as competitive or more competitive than large firms" The important message of clusters and industrial districts development is the need to focus policy on networks of firms rather than single firms. Schmitz (1995) comments that the problems of small firms are "not that they are small, but that they are isolated". Bringing them together into clusters enables them to achieve "collective efficiency" through collaboration.

Sources: Rabellotti: *World Development*, Vol. 23, No. 1, 1995; John Humphrey: *World Development*, Vol. 23, No. 1, 1995, and Raphael Kaplinksy, Background Paper II/3 (ID/WG.542/7(SPEC.)).

295. Such an approach presupposes also that, in the interests of developing indigenous technological capability, Governments will be willing to turn away job-creating FDI. While this argument may be feasible in some advanced developing countries of Latin America and Asia, it has little relevance to less developed economies in Africa, where the need for industrial development is most pressing. Arguably the only sub-Saharan State capable of taking this route to industrialization is South Africa.

- Less developed economies have little choice in terms of delaying liberalization to give local manufacturers time to restructure, as this overlooks the pace and extent of the globalization process.

- It is necessary that Governments in industrially less developed economies strengthen their administrative and institutional capacity to operate a selective intervention strategy.

296. The appeal of a selective intervention approach is greatest in the more advanced developing countries where, as in Asia, the institutional capacity is sufficient for the use of targeted interventions. However, several countries have progressed too far with

liberalization and are too closely integrated with the global economy to be able to turn back, even assuming that they wished to do so.

Box 6.5
FDI and technological advance in Singapore

The introduction of new technologies through the establishment of TNCs in Singapore, rather than via the licensing of foreign technologies to local firms, produced important benefits.

- Transational corporations picked up much of the start-up risk involved in implementing new technology;

- Technological catch-up and upgrading were faster than in instances where domestic firms were forced to traverse the entire learning curve; and

- There was a spillover of learning-by-doing gains to indigenous firms. The presence of foreign TNCs may have facilitated the adoption of new technologies by domestic firms as well.

There were also spillover effects in the development of clusters of indigenous firms around TNCs, providing the latter with components and support services. To maximize the potential benefits from such spillovers, a Local Industry Upgrading Programme was adopted in 1986 whereby TNCs were encouraged to "adopt" local subcontractors and diffuse technology to them.

Policy intervention and industrial organization

297. The case for targeted interventions is underscored by the pressing need for developing countries to undergo a revolution in industrial organization at the plant, firm, industrial and economic levels. In turn, this revolution challenges the conventional wisdom on industrial policy. Experience in industrialized and developing countries during the 1970s and 1980s demonstrates that there is much more to industrial restructuring and the achievement of international competitiveness than investment in state-of-the-art technology. While the switchover to more flexible manufacturing techniques was the appropriate response to the new forms of global competition, spearheaded by the Japanese TNCs, new methods of industrial organization are equally crucial to building sustained competitive advantage.[6/]

6/ UNIDO Background Paper, Raphael Kaplinsky, *The Implications of New Organizational Techniques for Developing Countries (ID/WG.542/7 (SPEC.))*.

298. The new form of industrial organization - mass customization (Box 6.6) - has enabled manufacturers to compete on a cost-efficient basis via large-scale production while satisfying consumer demand by supplying high-quality, differentiated products.

299. At issue is whether mass customization is appropriate - or indeed feasible - in developing countries. On the supply side, while some leading firms in Western industrialized economies have reached the "successful follower" stage, the leading developing-country firms lie at the boundary of the "moderately successful/successful follower" phases. More importantly, perhaps, the bulk of developing-country industry, including key elements in the supply chain to leading developing-country firms, is lagging behind.

300. In addition, it is questionable whether mass customization is the appropriate strategy for low-income economies where consumer demand is driven more by price than quality or differentiation. In fact, however, mass production techniques, characterized by poor quality and large inventories, are "economically wasteful", compared with the mass customization advantages of lower-cost production, higher quality and enhanced product differentiation. In the Uruguay Round era of intensified international competition, mass production firms in developing countries will face increased competition from foreign-based TNCs, themselves exploiting the mass customization strategy on a global basis. Accordingly, mass customization is as relevant to developing countries today as mass production was in previous decades.

Potential supply-side constraints

Human capital

301. Scarce human capital is a major potential obstacle to mass customization in developing and especially least developed countries. However, research shows that:

- Educational and training barriers to the adoption of mass customization techniques are "often negligible";

- Training (mainly intra-firm) is more important than formal school education;

- The greater the degree of flexibility required in production, the more the need for multi-skilling. This is applicable to the broad range of workers and not just to an elite of skilled personnel. Accordingly, it is essential to diffuse skills across the entire workforce rather than merely increasing the proportion of skilled operators; and

- The adoption of new organizational procedures depends on the availability of a multi-skilled workforce as well as workers with a greater understanding of the underlying technical processes in the industry, though it is unclear what level and forms of education are required for appropriate in-house and other vocational training to succeed.

Inter-firm linkages

302. Western economies have experienced great difficulty in replicating the Japanese model of "clubs" of suppliers providing inputs and components. Poor supplier capability, especially where inputs are sourced from SMEs and inadequate physical infrastructure, notably transport and communications, constrain the development of inter-firm linkages in developing countries. In the early 1990s, Ford Motor Company's Mexican assembly plant at Hermosillo imported 65 per cent of initial component purchases by value (and 80 per cent by weight) from Japan because of difficulties with local suppliers and a weak transport infrastructure. Road and rail deliveries, even over short distances, took between ten and 30 days and the plant had to be located near a deep-sea port so that just-in-time (JIT) supplies dispatched by sea from Japan could be delivered to the factory.

303. Similar problems with suppliers and infrastructure are reported from other developing countries, which have encountered considerable difficulty in implementing the new organizational techniques.

Managerial failure

304. Transition to mass customization is dependent upon managerial commitment at all levels of the firm. Weak management, especially in small and medium-scale family enterprises, and inappropriate and outdated management training systems focused on mass production techniques are obstacles to the adoption of new organizational structures.

Related and supported industries

305. In most developing countries, manufacturing industry is not diversified to the point where a network of domestic suppliers of components and inputs has evolved. Competitive advantage can emerge from the development of close working relationships between networks of home-based suppliers, thereby reducing dependence on imported components and inputs, and facilitating the adoption of flexible production systems.

Implications for policy

306. To accelerate the diffusion of mass customization techniques, State intervention is necessary in four key areas:

(i) **Increasing the demand for organizational change in production.**
Governments should take the lead in disseminating information about the benefits of innovation, the obstacles to be overcome and the services available to firms adopting new techniques. This is particularly important for the SME sector, whose development must be fostered as part of programmes to establish networks of domestic suppliers.

(ii) **Improving organizational capacity.**
There are three main channels for this type of technology transfer:

- Through the internal operations of TNCs, where new organizational technologies can be transferred across national borders; and

- Where the developing-country firm itself takes the initiative in adopting new organizational structures.

- Because the consultancy industry may be inadequate in several developing countries and are often working with outdated techniques. Governments have an important role to play in strengthening and subsidizing access to such services by SME producers.

(iii) **Developing organizational capabilities at local and sectoral as well as national levels.**
Italy has been highly successful in developing industrial districts populated by clusters of small firms usually, but not always, manufacturing in the same sector. Indirect costs of production (i.e. purchasing, marketing and market intelligence) are shared by collaborating firms. In this situation, the transfer of new organizational techniques is best achieved by initiatives at sectoral and local government levels, as has been done in Japan and Germany as well as Italy. Often the sectoral focus is achieved by industry associations, with funding and other technical support from Governments and international organizations such as UNIDO.

(iv) **Providing an appropriate macroeconomic environment.**
In addition to targeted, selective interventions, macroeconomic stability is necessary for the accelerated adoption of mass customization techniques. In particular, the new organizational methods are labour-intensive, implying that their adoption will be delayed, or even dropped altogether, where the factor price regime is skewed in favour of low-cost capital rather than labour. However, this is unlikely to be a major problem since price does not appear to have been a significant issue affecting the shift towards flexible manufacturing even in countries where factor prices are distorted.

307. Outward-orientation of the trade regime is also important given the positive relationship between flexible production and export-led industrial growth, while physical infrastructure - and a strong telecommunications system in particular - is crucial to successful innovation.

The role of SMEs

308. A well-developed supplier network populated by small and medium-sized enterprises capable of providing quality components was crucial to the successful adoption of JIT systems in countries like Japan, Italy and Germany. Accordingly, Governments should give high priority to measures to foster SMEs.

Consultation is vital

309. Consultation with the main agents of industrialization is essential to successful policy implementation, and there is a very real danger of the process failing unless the key actors are "deeply involved" in policy design and implementation.

Box 6.6
Mass customization versus mass production

Massive investment in state-of-the-art plant and machinery and new technologies in many Western industrial economies failed to lift productivity levels to those achieved by some Japanese manufacturers. A striking example was that of General Motors, which invested $70 billion between 1976 and 1985 - much of it in sophisticated, electronics-based automation technology - but still continued to lose market share to the Japanese manufacturers.

This kind of investment in "embodied technology" generally fails to pay off unless accompanied by far-reaching changes in industrial organization, encapsulated in the transition from traditional mass production methods to flexible mass customization techniques.

Two models of mass customization have evolved over the years:

- The Japanese model, in which the process is undertaken within large integrated firms; and
- The European model (Italy and southern Germany), where clusters of small firms collaborate to achieve "collective efficiency".

Mass customization, with its emphasis on flexible production techniques and small batches rather than large-scale, specialized mass production is more appropriate for modern patterns of consumer demand driven by quality and differentiation attributes.

There are four crucial requirements when restructuring industrial production along mass customization lines:

- A new form of factory layout - cellular production - in which individual "mini-factories" target individual market segments;
- Utilization of multi-skilling and multi-tasking work practices;
- The introduction of quality-at-source procedures; and
- The adoption of a new "continuous improvement" system of social relations of production (the Japanese *kaizen* system).

continued

Box 6.6 (continued)

Three of these four requirements highlight the crucial role of human capital - that is, educated and trained labour - in the production process, along with the need for a "new compact" between management and the workforce. The factory layout decision is essentially technical.

A key contrast between the two systems is the changed perception of labour. In mass production, labour is a production cost to be minimized, while in mass customization it is a resource to be augmented and is capable of making a substantial contribution to innovation.

As well as reorganizing the firm internally, mass customization implies a revolution in relationships with other companies. The conventional arms-length relationship of mass production is replaced by a closer, longer-lasting cooperative relationship with suppliers and distributors; this has potentially far-reaching and positive implications for SMEs. In the "Third Italy", for instance, mass customization has been achieved by the clustering of SMEs networking with each other in the clothing, shoe, furniture and food-processing industries. This model is one with enormous potential for industry in the developing countries.

Source: UNIDO Background Paper, Kaplinsky, *op. cit.*

Industrial development and structural adjustment

310. Critics of structural adjustment programmes complain that liberalization has proceeded too rapidly, resulting in de-industrialization, especially in sub-Saharan Africa. In its *Global Report 1992/93,* UNIDO questions whether structural adjustment has resulted in shifting workers from more to less productive sectors. It is estimated that 14 African countries experienced deindustrialization in the second half of the 1970s, increasing to 15 in the first half of the 1980s. Of the 27 sub-Saharan economies analysed by UNIDO, 15 underwent a 30 per cent or greater structural change between 1970 and 1975, while 14 experienced a similar adjustment between 1980 and 1985.

311. Table 6.1 lists 18 Sub-Saharan countries for which World Bank estimates of manufacturing's share in GDP are available for 1970 and 1993. It shows that in more than ten States - including Ghana, which is widely regarded as Africa's most successful adjuster - manufacturing's contribution to GDP declined.

312. Unfortunately, the length of period covered masks the adjustment effects of structural reform, most of which have only been felt since the mid-1980s (see Box 6.7). At the same time, it shows not only that the region has failed to industrialize but that in a small majority of cases, industry's share has actually fallen. Output and employment

have fallen in the clothing and textile sectors in South Africa, United Republic of Tanzania, Zambia and Zimbabwe partly due to increased competition from imports, including second-hand clothing.[7/]

Table 6.1. Deindustrialization in sub-Saharan Africa, selected countries, 1970 and 1993
(Percentage share of manufacturing in GDP)

	1970	1993
Botswana	6	4
Burundi	7	11
Cameroon	10	11
Chad	17	16
Ghana	11	8
Guinea Bissau	21	8
Kenya	12	10
Mali	7	9
Mauritius	14	23
Niger	5	7
Nigeria	4	7
Senegal	16	13
Sierra Leone	6	5
South Africa	24	23
Togo	10	7
United Republic of Tanzania	10	5
Zambia	10	23
Zimbabwe	21	30

Source: World Bank, *World Development Report, 1995.*

313. The neglect of manufacturing has been a weakness in many adjustment programmes, in African countries in particular. Thus the Zimbabwean adjustment programme "assumed", without any coherent strategy for manufacturing, that industry would be the lead sector during the adjustment period. In the event (Box 6.7), industrial output fell, and the closure of one of the country's largest manufacturers (Cone Textiles) and the threat to its steel producer (Zisco) underscore the consequences of undergoing adjustment without an industrial policy. Similar comments apply to many other African economies.

314. African countries need to formulate industrial strategies to respond to this situation focusing on micro-level analysis while acknowledging that technology acquisition and absorption is an evolutionary process dependent both on the industry and on national technical capabilities. Given resource constraints and the need to avoid a state of "permanent infancy" when promoting a particular activity, the number and range of firms and sectors may have to be limited.

7/ UNIDO Background Paper, M. T. Nziramasanga, *Formulating Industrial Policy in Africa: 2000 and Beyond* (ID/WG.542/24 (SPEC.)).

The "de-sophistication" of industry

315. The shift to a more open trade regime in Latin America "seems to be inducing deep changes ... bringing about a shift towards assembly-like operations, closer to the *maquila* industrial organization model than to the domestic fabrication model".[8/] Latin American firms have switched from local production to importing - expanding their operations as commercial distributors of foreign brands and lowering their commitment towards local fabrication. One researcher cites the case of automobile manufacture, where import content and the range of updated models have increased as manufacturers become part of a globalized, rather than national, strategy.

316. This underscores the extent to which trade liberalization is contributing to the "de-sophistication" of the Latin American industrial fabric, reducing the number and range of manufacturing activities that can be undertaken locally.

317. To restore domestic value-added and competitiveness, Latin American industry must invest heavily in both hardware and "a major upgrading in human capital and organization capabilities." This would require a more active and interventionist industrial policy.

Box 6.7
Industry and structural adjustment in Africa

During the structural adjustment phase, the experience of sub-Saharan manufacturing sectors has been mixed although fragmentary, anecdotal evidence - some of it supported by official statistics - points to significant de-industrialization. This fragmentary evidence includes complaints from manufacturers in Ghana, Nigeria, Kenya, United Republic of Tanzania, Zambia and Zimbabwe that, following trade liberalization, they are unable to compete with imports.

- In Uganda, growth in manufacturing value-added averaged 10 per cent a year during the reform period (1987-94), albeit from a tiny base. In addition, much of this represented recovery rather than new activity.

- In Nigeria, MVA growth averaged 2.4 per cent annually between 1985 and 1993. As a ratio of GDP, manufacturing contracted from 8.5 per cent to 7.4 per cent over the same period. In 1994, the volume of industrial production was 30 per cent below its 1982 peak. Capacity utilization declined from 40 per cent in 1986, when structural adjustment was introduced, to 28 per cent in 1994.

continued

8/ J. M. Katz, Technology and Industrial Restructuring in Latin America - the New Evidence (Mimeo), 1995, p. 13.

Box 6.7 (continued)

- In Kenya, industrial output grew at 5 per cent annually during the 1980s and early 1990s, although much of this expansion preceded the sweeping trade liberalization of 1993/94. In the three years to 1995, the Economist Intelligence Unit estimates industrial growth at 2.5 per cent a year, while manufacturing's share of GDP has remained around 12-13 per cent for the past 14 years.

- In Ghana, industry's share in GDP collapsed from more than 20 per cent in the mid-1970s to a pre-reform low of 6.6 per cent in 1982. It recovered to 18 per cent in 1993, but since industry is defined to include the country's lead sector, mining, which accounts for more than 45 per cent of total exports, this substantially overstates manufacturing's contribution to GDP.

- In Zambia, manufacturing production has shrunk by one-third since 1990, although, as in Zimbabwe, this is partly attributable to severe drought. Manufacturing's share of GDP declined to 22 per cent in 1994 from over 25 per cent in the late 1980s.

The nearest sub-Saharan Africa has come to a successful, protectionist strategy for manufactures was in Zimbabwe, where the strategy delivered modest growth. High protection gave rise to an infant industry which produced small quantities of almost every product needed in the country. Trade liberalization in 1991 produced a severe short-term contraction in output "as most firms were out-competed by foreign products". "The strategy of starting with import substitution and then switching to export is proving both costly and slow even in this most favourable of African environments." The share of manufacturing in GDP has shrunk marginally from more than 25 per cent in 1991 to 23.5 per cent in 1994, and Standard Chartered Bank forecasts that 1995 industrial output will be 5 per cent below its 1990, pre-adjustment levels.

Sources: World Bank, *Continent in Transition* (forthcoming); Economist Intelligence Unit; Standard Chartered Bank: *Business Trends*, Zimbabwe, July 1995.

Industrial restructuring in the countries in transition

318. Without restructuring, many enterprises in the former centrally planned economies of central and eastern Europe will not be viable. Accordingly, Governments have adopted a menu of restructuring and privatization strategies, though experience has shown that it is not enough to rely on the "invisible hand" of market forces. Giving private enterprise the lead role in industrial development does not eliminate a role for

the State, but assumes the existence of a competent bureaucratic machinery willing and able to work closely with individual entrepreneurs.[9/]

319. In Poland, the Government has played an active role in the restructuring process - offering tax incentives and low-interest credits to selected enterprises. A clearly-stated industrial strategy was needed also to accommodate organized labour, while many of the lessons learned from industrial restructuring in the West have been applied successfully in Poland elsewhere in the region.

Conclusions

(1) Because there is no single East Asian model to emulate and no firm consensus on precisely what form of intervention will optimize industrial growth in developing countries, and especially LDCs, industrial policy is best viewed as a menu of options. The range of choice open to Governments is narrowing as globalization takes hold because although globalization does not eliminate the need for industrial policy, it limits the options.

(2) There is broad agreement on:

- The need for some selective, targeted interventions: and

- The importance of outward-oriented strategies whereby a country's manufacturing sector is driven by the discipline of market competition.

(3) The more advanced the developing country, the greater the range of choice. LDCs in many markets, with weak infrastructures and a poor skills and technology base have little option but to focus on simple, consumer-based industries, initially at least. Given their small markets, their prospects for attracting major FDI inflows (other than into natural resource industries) are poor. For such States the option of shutting out technology and FDI has no advantage, and they may need to concentrate on fostering labour-intensive operations and developing an export-platform strategy, as in Mauritius.

(4) Technological upgrading and human capital investment are crucial to competitiveness in the 1990s and beyond. There is a clear role for the State - and for UNIDO and other international agencies - in both fields.

(5) Domestic rivalry is a prerequisite for competitiveness.

(6) Clusters and industrial districts have an important role in the development of globally competitive SMEs. This is an area where UNIDO can make an increasingly important contribution.

9/ H. Muegge and G. Assaf, *UNIDO and the Economies in Transition*, 1993, p. 233.

(7) Such is the pace of technological and organizational change that policies must be flexible and dynamic. The shelf life of measures that succeeded in the 1980s may already have been exhausted.

(8) Incentives are more likely to succeed than sanctions. Efforts to constrain FDI or limit technology imports run the risk of deterring investment altogether.

(9) Structural adjustment programmes should include a specific strategy for manufacturing. The expectation that manufacturing will blossom in the absence of a coherent strategy has not been borne out by African experience.

(10) One of the most important lessons of East Asian experience is that intervention worked where it was carried out in close co-ordination with the private sector. Industrial policy responded to the problems and needs of private enterprise rather than seeking to impose elaborate schemes according to the dictates of grandiose national plans.

(11) Ultimately, competitiveness succeeds or fails at the enterprise rather than the national level. Governments can - and should - create an enabling environment for business and investment, but the choices of what to make and sell, and how and where to do it, must be left to entrepreneurs.

CHAPTER 7. ENVIRONMENTAL POLICIES AND INDUSTRIAL COMPETITIVENESS

320. There is concern in both industrialized and developing economies that environmental policies will impact adversely on industrial efficiency and competitiveness. Firms in developing countries fear that stricter environmental standards in developed countries will result in a loss in market share and export earnings due to higher compliance and production costs. In addition, there is concern about the relocation of "dirty" industry from developed to developing countries to take advantage of lax environmental laws. This is of concern not only to developing countries but also to labour unions in industrialized developed economies. The latter see the migration of industry to developing countries as a potential threat in terms of job losses.

321. The background paper[1/] investigates the relationship between environmental policies (domestic and international) and industrial competitiveness in order to assess the magnitude of the problem and propose mitigating measures wherever the impacts are found to be negative.

322. It is clear that at the enterprise level, there may be short-term adverse consequences for firms in certain sectors. Small- and medium-scale companies operating in natural resource-intensive or pollution-intensive industries can be especially vulnerable to strict environmental standards. In general, the limited empirical evidence illustrates that the competitiveness effects on individual firms of stringent environmental norms will vary depending on a number of factors, including: the type of industry and its share in export markets; the firm's size and location; degree of openness of the economy and the rate of economic growth; availability of infrastructure facilities especially for small firms; availability of timely information on foreign standards and environmental regulations and national environmental norms and standards.

323. A major source of concern for developing country exporters has been the introduction of eco-labelling requirements in developed countries. The multitude of schemes, lack of information, and institutional facilities for certification and testing could well be seen as barriers to trade and competitiveness. Since the establishment of eco-labelling criteria and procedures is in the process of being developed, measures to mitigate potential problems associated with eco-labelling requirements need to be taken at an early stage. If eco-labelling requirements are based on international labels developed with the participation of foreign countries, and on mutual recognition of labels, it would alleviate the trade problems associated with eco-labelling programmes.

324. Despite the adverse effects that may occur for certain firms and sectors in the short run, it is also evident that in the medium to long run, the competitive position of *efficient* firms in export markets is likely to improve if timely implementation of cleaner production and pollution prevention options is undertaken.

1/ UNIDO Background Paper, *Environmental Policies and Industrial Competitiveness. Are they Compatible?* (ID/WG.542/27(SPEC.)).

325. At the macro level the impacts on competitive positions of countries is less worrying. Various studies have shown that the effects on industrial competitiveness at the macro level are limited due to: the relative insignificance of compliance costs in overall costs of industrial production; and the fact that negative effects at the level of firms are largely offset by positive environmental benefits at the macro level. This is especially the case where cleaner technologies have been adopted resulting in greater efficiency in production, reduced input costs, reduced clean-up costs and increased production of environmentally accepted goods and products.

326. It is true that the share of developing countries in the production and trade of pollution-intensive goods has increased, but this is not necessarily due to differences in environmental standards between developed and developing countries. Cost advantages of locating heavy pollution-intensive industries in a particular region or country may arise due to lower wages and material costs. Environmental compliance costs are only a minor percentage of total costs. An exception to this general conclusion concerns those sectors or firms that already suffer from competitive losses due to other factors and are forced to relocate abroad in response to additional environmental regulations.

327. The key to sustainable industrial development lies in capitalizing on "win win" situations that combine the objectives of industrial development and environmental protection. The role of industry as an agent for pollution prevention and resource conservation is of crucial importance. Actions at the policy, institutional and enterprise levels have to be combined in order:

- To replace polluting technologies increasingly with cleaner production processes that minimize pollution intensities and reduce pollution at source.
- To encourage industrial innovation , research and development efforts.
- To encourage industry to conserve non-renewable and renewable resources through increased efficiency in production, recycling and conservation practices.
- To address the special problems of small- and medium-scale industry.

Factors affecting competitiveness

328. The following factors affect competitiveness:

(a) **Private-sector compliance expenditures:** Environmental policies may induce firms to use fewer raw materials and energy inputs, thereby reducing operating costs. In the short term fixed costs may increase because of environmental regulations but decline over time as they are amortized. Where compliance costs vary significantly between countries, high-cost States will lose competitive advantage and this could influence industry location decisions;

(b) **Monitoring and enforcement costs of government regulations:** Competitiveness will be affected where there are marked differences in the stringency and enforcement of regulations between countries;

(c) **Negative costs:** Environmental regulations may result in cost *reductions*. Research by the Institute for Applied Environmental Economics in the Netherlands shows that the

implementation of environmentally friendly technologies has led to a 2 per cent annual reduction in production costs;

(d) **Time horizons:** On the whole, any adverse impact on corporate competitiveness will decline over time and may even turn positive as a result of increased efficiencies;

(e) **Firm size:** Small firms may be more vulnerable than large companies to the extent that they are less informed about environmental standards, especially in foreign markets. Small firms may also be disadvantaged where they lack the capital to be able to invest in cleaner technologies.

(f) **Factor costs:** The costs of investment in clean technology, labour and resource costs.

Enterprise-level effects of environmental regulations

329. The limited empirical evidence available suggests that the corporate impact of environmental regulations varies between sectors and enterprises. Compliance costs tend to be most burdensome in sectors such as mining, chemicals, pulp and paper and oil refining that make intensive use of natural resources and are highly pollutive. Case-studies indicate that the impact on competitiveness varies with:

- The type of industry and its export market share.
- Firm size and location.
- The degree of economic openness and the rate of GDP growth.
- The availability of infrastructure, especially for small firms.
- The availability of information on foreign environmental regulations.

330. Case-studies show that:

- Competitiveness is more likely to suffer in small firms and companies operating in natural-resource-intensive industries such as food processing in Zimbabwe and energy-intensive industries in Poland. In Zimbabwe's case, it is foreign environmental regulations that threaten the export competitiveness of meat production while, in the latter, domestic requirements are responsible.
- Even in the case of small and medium-sized enterprises (SMEs), however, these adverse effects may be offset where appropriate clean technology and waste-minimization strategies are adopted in good time;
- In all probability, the net return on appropriate environmental protection measures is positive;

- Timely access to information on foreign environmental regulations and standards mitigates the short-term impact on competitiveness.

331. Even in industries that suffer from short-term adverse impact, research conduct by shows that cleaner technologies and waste-reduction techniques can yield substantial economic benefits, thereby minimizing the adverse impact on competitiveness.

Box 6.1
From waste to profits: UNIDO's project DESIRE
(Demonstration in Small Industries for Reducing wastE)

Results	Pulp and paper	Textile processing	Pesticides formulation	Total
Number of units	4	4	4	12
Waste minimization options identified	197	119	133	449
Options implemented	72	51	73	206
Options under implementation	37	36	13	86
Total investment in waste minimization	Rs 9.5 million	Rs 1.4 million	Rs 0.4 million	Rs 11.3 million
Monetary savings	Rs 28.5 million[a/]	Rs 7.1 million	Rs 0.2 million	Rs 35.8 million
Pollution load reduced	Effluent vol. 32% COD 31% Total solids 40%	Effluent vol. 30% COD 16%	Effluent vol. 74%[b/]	

a/ Including savings due to reduction in effluent treatment.
b/ Represents expected reduction in toxic fugitive emissions and risks from health hazards.

National-level impact of environmental regulations

332. At the national level, UNIDO estimates that industry's annual expenditure on environmental protection will be $15 billion assuming that developing countries spend 0.25 per cent of GDP on environmental compliance by the year 2000. If it is assumed that developing-country industries devote 1.5 per cent of manufacturing value-added (MVA) to environmental compliance, spending will reach $17 billion by 2000.

333. Case-studies of several countries support the above estimates. Notable exceptions however may be found in the case of transition economies (see below).

334. Case-studies of three Latin American and one Asian country suggest that average compliance costs are insignificant. In the Philippines, pollution abatement costs were less than 1 per cent of total expenses, exceeding 2 per cent only in the electricity, and crop and livestock production sectors.

335. In Colombia, a survey of exporting firms found that only 16 per cent had experienced major adverse effects on competitiveness, while 63 per cent said effects on their competitive positions were insignificant. Although exports from Argentina and Brazil are heavily resource- and energy-intensive, the environmental impact on competitiveness has been slight, partly reflecting industry's early adoption of EU packaging requirements.

336. In general, negative effects at the firm level have been offset by positive environmental benefits at national level. Cleaner technologies mean lower input costs, reduced clean-up costs, increased production of environmental goods and enhanced productive efficiencies.

Implications for competitiveness in east European economies

337. Macro-level problems are particularly severe in the transition economies, where primary energy consumption per unit of value added is often three times higher than in western Europe.[2/] Exceptionally heavy reliance on energy and extensive resource extraction has had a devastating impact environmentally, with high carbon sulphur dioxide emissions, discharges of saline mine water into rivers and the destruction of large areas of land.

338. The transition to a market economy should improve the region's capacity to deal with environmental problems by penalizing the massive waste of resources and the resulting pollution of the past. Market reform should encourage a shift towards less-resource-intensive and cleaner activities and technologies.

339. A striking example of the potentially adverse impact of energy policies in Poland is the UNCTAD estimate of a 40 per cent rise in electricity costs, resulting in the loss of the comparative advantage of electricity exports to the Czech Republic and Germany. Prices of energy intensive items - plastics, fertilizers, organic chemicals and some building materials - will increase with a consequential loss of export markets, while production costs in coal mining could increase by as much as 10 to 15 per cent, also with adverse implications for export earnings.

340. Environmental controls will reduce capacity in the Polish steel industry, but the remaining plants will be more efficient thereby lowering production costs by between $20 and $25 a ton. Cleaner production processes will cut environmental damage from steel industry activities by 70 to 80 per cent.

2/ UNIDO, *UNIDO Assistance to the Countries of Central and Eastern Europe*, 1993.

The implications of eco-labelling

341. Developing countries fear that eco-labelling — that is, the voluntary use of labels to inform consumers that a product is environmentally friendly — in industrialized economies will harm their export competitiveness and reduce market access. Eco-labelling is a marketing tool to attract environmentally sensitive consumers.

342. Developing countries are at a disadvantage because they lack the information and infrastructure (in the form of certification and accreditation bodies) necessary to qualify for many eco-labelling programmes. Their firms have limited access to clean technologies and may incur higher compliance costs in meeting eco-labelling standards than their OECD competitors. There is also a danger that eco-labelling will distort the environmental priorities of developing countries by diverting pollution-reduction spending from national priorities to addressing the concerns of consumers in industrialized countries.

343. The ISO/DIS/14020 standard for eco-labelling developed by the Technical Committee of the International Standards Organization (ISO) may address some of these issues, but more must be done to ensure that eco-labelling does not become a trade barrier that discriminates against developing-country exports.

Measures to alleviate adverse impacts from eco-labelling

344. Possible measures to alleviate fears regarding the impact of eco-labelling requirements on competitive advantages have been discussed. The following paragraphs give some additional ideas on how the recommendations could be implemented in practice, especially in collaboration with multilateral development assistance:[3/]

- Since eco-labelling procedures are based on a cradle-to-grave approach, local industry associations should be supported in training their staff on the cradle to grave management style of production and marketing, with due consideration for local comparative advantages and resource availabilities.

- Assistance may be given to private sector associations in obtaining easy and inexpensive access to an internationally recognized certification scheme. This may be done for example by establishing certification offices in exporting countries. This would entail training of local inspectors by specialized organizations and certifiers from developed countries. An example of such a scheme is a pilot project sponsored by the French aid agency for the introduction of eco-certification for sustainable forestry in Africa in response to threats of boycotting tropical timber products from Africa.

- Improvement in information flows, transparency and consultations reduce the costs of transition and adaptation to sustainable production and consumption

---

3/ These ideas were discussed and agreed upon at the OECD Workshop on Trade, Environment and Development Cooperation, October 1994, Paris. See Summary Report OECD/GD (95) 10.

patterns. International assistance to facilitate policy coordination and consultation procedures on a North-South and South-South basis is essential.

- The establishment of graduated qualification systems that indicate the level of "eco quality" of a product provide more accurate information to importers and consumers regarding the environmental friendliness of the product and also make market access easier for developing country exporters. This an important area where multilateral assistance would be required.

- Technical and institutional support for infrastructure facilities for testing, monitoring, certification and research and development are lacking or insufficient in a number of developing countries. Multilateral assistance should be coordinated closely with the private sector to provide these facilities.

International agreements and competitiveness

345. Whereas it is difficult to quantify the competitiveness impacts of international environmental agreements, the Montreal Protocol on Substances that Deplete the Ozone Layer attempts to reimburse incremental costs through financial and technical assistance. Competitiveness impacts of environmental-related NAFTA clauses are still unclear. However the existence of parallel provisions for technical and financial assistance from international agencies provides a reasonable cushion for lessening adverse impacts.

Response options

346. Governments and industry may use a variety of policy and technical options to mitigate the adverse impact of environmental protection regulations, as follows:

Policy responses

347. Policy responses are as follows:

(a) Greater use should be made of economic instruments and incentives (in the form of pollution and user charges, tax and subsidy measures, and realistic pricing of natural resources) to complement command and control measures. Not only are such measures more cost-effective and efficient, but they also promote pollution control, and they internalize the environmental costs of industrial operations;

(b) Developing countries should adopt the polluter - or beneficiary - pays principle while seeking to link environmental performance to profitability. Policy should seek to ensure that firms that perform better environmentally also perform better in the marketplace;[4/]

(c) An integrated effort on the part of Governments and industry is required to ensure the implementation of ecologically sustainable growth strategies and, in particular,

---

4/ UNIDO Background paper (ID/WG.542/27SPEC.), *op. cit.*

promotion of the use of cleaner technologies and waste reduction at source. In response to stricter environmental laws, some firms are starting to emphasize pollution prevention rather than control;

(d) At the policy level, Governments can use fiscal measures to influence technology choice - e.g. by raising the prices of synthetic fertilizers and so discouraging their use. At the enterprise level, firms can be encouraged to adopt production techniques that use less energy and supply cleaner, more environmentally friendly products;

e) Three broad categories of policy instruments are available:

(i) Economic incentives and disincentives, including taxes, subsidies, accelerated depreciation allowances, effluent charges and direct financial support;

(ii) Regulatory policies covering aspects such as quality standards and pollution emissions;

(iii) Locational policies to ensure that industries are located at environmentally optimal locations, and that export-processing zones and industrial sites are meeting national regulations while maintaining their competitive edge in world markets.

Providing technical assistance

348. Certain firms or sectors may require external assistance to counter adverse impacts due to strict environmental regulations. Technical assistance and the transfer of cleaner and more appropriate technologies should be provided by Governments with assistance from bilateral and multilateral agencies such as UNIDO for:

- Further promotion of **cleaner production processes** including: establishing cleaner production centres for capacity-building, information dissemination and training; subsectoral demonstration projects; public, private and international collaboration in environmental services; life-cycle analysis.

- **Energy conservation and efficiency** including: national assessments of greenhouse gas emissions and identification of reduction methods; transfer of energy-efficient technologies relevant to natural resource endowments and industrial requirements; building national capabilities for energy-efficient design and manufacturing; developing and promoting technologies for use of renewable sources of energy; technology transfer for improved efficiency of fossil-fuel-based power generation.

- The wider **use of economic incentives** as complements to command and control measures of pollution prevention;

- Concern with the **social aspects of industrial and environmental regulations** in terms of health and productivity impacts as well as working conditions in factories.

- The **use of environmental management systems** by industry. These are understood to include organizational structure, responsibilities, practices, processes and resources for implementing and maintaining environmental management. The latter comprises those aspects of the overall management function of an organization that develop, achieve, implement and maintain its environmental policy and objectives. Environmental management systems should enable organizations to achieve and demonstrate sound environmental performance by controlling the environmental impact of their activities, products and services, taking into account self-determined environmental policy and objectives. It also enables an organization to anticipate and meet growing environmental performance expectations, to ensure ongoing compliance with national and/or international requirements and to continually improve its environmental performance.

- Promotion of special programmes and support systems to **improve the environmental performance of small-scale enterprises**. This must be done by providing an enabling policy framework, technological assistance for adoption of environmentally sound technologies, and, institutional support.

- building up **technical capabilities and infrastructure for certification and testing** to overcome non-tariff and market barriers arising from requirements such as eco-labelling. Given the potential threat posed to developing-country exports by the growth of eco-labelling, there is a strong case for selective intervention by national, international and sectoral organizations to improve eco-labelling capacity in developing countries.

Conclusions

349. While the link between competitiveness and environmental policies is complex, evidence suggests that, with the exception of some small-scale and resource-intensive firms, the impact of environmental policy on compliance costs and therefore competitiveness is insignificant. The correlation between the stringency of environmental regulations and competitiveness is forecast to weaken further in future because of:

- The probability that weak players, unable to comply efficiently with environmental standards, will be forced out of the market and replaced by more efficient firms.

- Adverse competitive effects will not therefore persist in the longer term.

- The increased adoption of environmentally appropriate technologies and production processes will in the longer run generate economic and environmental benefits that will compensate for any short-term increase in costs.

350. The potential impact on developing-country exports of eco-labelling in industrialized economies is a possible - serious - exception to these broadly optimistic findings. Concerted efforts and assistance from bilateral and multilateral agencies will be needed to improve information flows and establish certification centres in developing countries.

CHAPTER 8. SOCIAL PROGRESS THROUGH INDUSTRIALIZATION

351. Industrialization contributes to poverty alleviation and social progress primarily by creating employment but also by generating resources that can be harnessed to improve living standards and achieve social integration. For most, though not all, economies, industrialization is synonymous with economic and social development, and, as emphasized in UNIDO's position paper for the 1995 World Summit for Social Development,[1/] industrial development has a vital role to play in alleviating poverty through job creation and income generation.

352. Although manufacturing generates considerably greater output multiplier effects than any other sector of an economy, except construction, the partial de-linking of direct employment generation from industrial expansion has raised doubts about industry's contribution to the solution of global social problems. Industry is normally taken to be synonymous with manufacturing, but the term "industrialization" has a broader meaning, embracing a broader spectrum of productive activities linked to, or stimulated by, manufacturing. Forward and backward linkages with primary production in agriculture, energy and mining are highly developed, even in some of the least developed countries; more importantly, however, manufacturing has spawned a comprehensive network of linkages with service activities, and especially information services, that are a crucial element in technological progress in industry and that have far-reaching, as well as positive implications for social progress.

353. During the period from the end of the Second World War to 1975, MVA and employment in manufacturing grew rapidly. Even in Latin America, where doubts were expressed over industry's capacity to generate sufficient jobs, the expansion of the urban formal sector was more than sufficient to absorb the growing urban economically-active population. It has been estimated that the percentage of urban workers in the informal sector was lower in 1980 than in 1950 in Argentina, Chile, Colombia, Mexico, Peru and Venezuela. In Brazil, the informal sector share was constant while it rose only in Ecuador and Uruguay. For all its shortcomings, import-substitution industrialization generated more than enough jobs to keep pace with growth of labour force in a number of countries.

354. However, because such calculations ignore manufacturing's linkages, especially with the service sector, they understate industry's contribution to job creation. "The growth of direct manufacturing employment may be low compared to the overall growth of MVA and the economy as a whole, but it generates significant indirect employment." Furthermore, manufacturing growth has positive implications for the quality as well as the volume of employment.

1/ "Social Progress Through Industrial Development", Position Paper presented by UNIDO to the World Summit for Social Development, Copenhagen, Denmark, 6-12 March 1995.

Industry linkages and employment generation

355. Direct employment creation in industry has slowed as a consequence of economic progress, structural change, industrial restructuring and technological advance. While the restructuring and outsourcing of services previously performed in-house has meant job losses, the indirect job-creation capability of manufacturing has been much understated. Research shows that the indirect employment effects of investment in industry are large relative to direct effects resulting from inter-industry and cross-sector linkages.

356. During the early stage of industrial development, when inter-industry linkages are weak and per capita incomes low, indirect job creation is very limited. But as linkages develop, increasing numbers of indirect jobs are created because of industrial growth. Many aspects of agricultural production favour local processing and rural industrialization, and rural processing by SMEs is often cheaper and more efficient than large-scale processing.[2/]

357. In the specific case of linkages with agriculture, manufacturing contributes to rural poverty alleviation in three main ways:[3/]

- Job creation through forward production linkages mainly in food manufacturing and resource-based industrialization (textiles, wood products and furniture):

- Backward production linkages also generate jobs since farmers require agricultural inputs - machinery, implements, chemicals and pesticides; and

- Consumption-driven linkages as rising farm incomes boost domestic demand for basic manufactures - clothing and textiles, footwear, household goods, furniture and basic building materials. Invariably, these final demand linkages for a wide range of consumer goods through increasing rural incomes are more important than the other two categories.

Changing patterns of employment growth

358. At the same time, globalization and rapid technological development have changed the nature of the job creation process. One of the world's leading industrial groups, General Electric of the United States, maintains it production three times as much as it did in 1980, but with half the number of employees. Furthermore, the average skill level of that smaller workforce is substantially higher than it was fifteen years ago. In many industrialized economies, large organizations are shedding labour, leaving the small and medium-scale businesses to generate new employment opportunities. This is the consequence both of technological advance on one hand and industrial restructuring on the other, which has resulted in many industry-related service jobs being externalized and outsourced to SMEs.

2/ UNIDO Background Paper, Mudziviri T. Nziramasanga, *op. cit.*

3/ S. H. Park, *op. cit.*, p. 15.

359. For many developing countries, foreign direct investment, joint ventures and non-equity links were the main engine of employment growth along with rapid job creation in the services sector, especially the public sector, and high levels of informal sector absorption of potential employees. Today, this pattern has changed in three main respects:

- Low-cost unskilled and semi-skilled labour is less likely to attract foreign participation than in the past. Instead, FDI and joint ventures are attracted by high-quality, skilled personnel. On the whole, investment in modern, scale-effective plants creates fewer - and higher quality - jobs than in the 1960s and 1970s.

- Public-sector employment creation has slowed and - in many cases - turned negative as State-owned enterprises are privatized, invariably with substantial retrenchment of labour. At the same time, in the least developed countries, many Governments have been forced to trim their public service workforce in an effort to curb fiscal deficits.

- The advantages of informal sector development are assessed more critically than in the past. In a report by the World Bank, it is argued that the size of a country's informal sector is a rough yardstick of the degree of its underdevelopment,[4/] while the quality of informal sector employment ranks well below that in formal sector enterprises, especially in least developed countries where Governments are unable to provide comprehensive national social security schemes. The nature of informal enterprise is changing too with a growing emphasis on the role of linkages within clusters and industrial districts. In this sense informal sector enterprise is becoming increasingly formalized.

360. In any event, the industrialization growth path is not open to all countries to the same extent. In an increasingly open, fiercely competitive global economy, the scope of industrialization may be limited for some - possibly many - industrially less developed countries. While industrial growth options are available, the range of choice is narrowing, especially for those lacking the resources and capacity to upgrade technologically. The march of technology and the nature of a country's resource endowment influence not just the pace of industrial development but its pattern and character. Small, least developed economies with limited potential comparative advantage in manufacturing may have little option but to target service activities such as tourism or data processing, thereby leaving a limited role for manufacturing. Similarly, those developing countries with a strong physical resource base may benefit most by specializing where they have competitive advantage in primary industry, adopting a resource-based industrialization strategy focusing on adding value to primary inputs from agriculture and mining.

361. Above all, manufacturing's contribution to improved social conditions and reduced income inequality depends on a host of considerations, in particular the pattern of

---

4/ World Bank, *World Development Report, 1995.*

industrial development and the policy framework within which it takes place. Social progress is not guaranteed. Arguably, some industrialization has widened social inequalities; import-substitution-industrialization (ISI) policies, biased against agricultural development, are capital- rather than job-intensive and heavily reliant on imports, thereby limiting domestic linkage effects.

362. Trickle-down was invariably weak in those countries that followed capital-intensive and/or natural resource-intensive growth paths. Thus the Human Development Index (HDI) of the United Nations is substantially below the more conventional GDP per capita rating of living standards in the Middle Eastern and other resource-intensive oil-producing countries, as well as Brazil and South Africa, both of which have relatively high capital:labour ratios. Trickle-down effects and social progress have been far greater where a country's development strategy has targeted agriculture, labour-intensive industry or services.

Industrial policy, employment and poverty alleviation

363. For all these reasons, even where it is a viable growth strategy for least developed economies, industrialization is very unlikely to generate direct employment on the same scale as in the 1960s and 1970s. In the late 1990s and beyond, employment creation and poverty alleviation will have to be tackled in a very different global business environment - one in which the scope of national industrial policy may become increasingly circumscribed.

364. Although the past is often an unreliable guide to the future, some lessons can be drawn from the experience of the developed market economies and the newly industrializing countries as follows:[5/]

- In adjusting economies opening up to globalization, employment creation will not be concentrated among large firms. In countries like Brazil, India and South Africa, the share of employment in large companies is likely to stagnate or decline. To compete successfully in global markets, such firms must boost productivity and quality, which is unlikely to be compatible with an employment-creation strategy.

- The quality of employment in larger enterprises will change in two main ways:
  - Large firms will invest more in human capital, which will cover a greater proportion of the workforce with more formalized in-house and off-the-job training programmes; and
  - Intensified pressures for cost reduction will force firms to focus on core competencies and to contract out more work and requirements, resulting in increased reliance on supplier companies and less dependence on vertical integration. In some cases, this will mean the replacement of core jobs by lower-cost labour in SMEs and other suppliers.

5/ UNIDO Background Paper, Humphrey, *op. cit.*

- The composition of the manufacturing sector will change with industrial restructuring. Trade liberalization will divert orders from local to offshore suppliers, resulting in some job losses and some de-skilling of work in the intermediate goods, machinery and equipment sectors.

- As industry structure changes in the more advanced developing countries, there may be some job losses as production moves into more skill- and capital-intensive activities which employ fewer people per unit of output.

- Job losses in more advanced sectors will be offset by the growth of more labour-intensive activities in low-wage economies and resource-based industries, especially in Africa. However, such industries will be forced to upgrade technologically since comparative advantage, based on natural resource endowment, is frequently lost to new entrants or new products.[6]

- Increasingly, firms will need higher-quality labour in both labour- and capital-intensive industries. Multi-skilling and multi-tasking implies higher levels of both basic education and vocational training.

- In the fast-track Asian economies, employment will continue to grow rapidly in firms of all sizes but, in other regions, the main source of manufacturing employment growth is likely to be SMEs. Accordingly, there is a strong case for SME promotion on the grounds of export-generation and efficiency, and the satisfying of social goals such as poverty alleviation and social development.

Labour quality and competitiveness

365. With integrated international production, manufacturers establish individual value-adding activities in different locations, leading to greater labour market interdependence and a new international division of labour. Greater crossborder interdependence between transnational corporation (TNC) affiliates means that business activities are located in different countries and, in some instances, outsourced to subcontractors. The resulting relocation and interdependence of jobs highlights the much enhanced role of education and training in the attraction of foreign direct investment. Labour quality is increasingly influential in TNC location decisions, and developing countries able to provide the high-level skills required are much more likely to attract FDI in high value-adding activities than countries that are still reliant on low-cost, low-productivity personnel.

366. In a number of developing countries labour quality is improving rapidly, and at much lower wage levels than those applicable in the industrialized economies. China and Brazil rank third and fifth in the number of science graduates being produced

---

6/ Michael Porter, *The Competitive Advantage of Nations*, Macmillan, 1990.

internationally, while Brazil, China, Mexico, the Republic of Korea and the Philippines boast more engineering graduates than France or the United Kingdom.[7/]

A different growth path for developing countries

367. Efforts to devise a socially optimal industrial growth path for developing countries are constrained by the increasing pressure for competitive, export-oriented industrial development. Industries in the developing world can also no longer rely on competitive advantage in the form of natural resources and low-cost labour. Increasingly, competitive advantage is based on technological capability, the continuous upgrading of production techniques, quality and design, human skills, flexible production systems and aggressive marketing.

368. In narrowing the policy options available to national Governments, globalization is forcing developing countries to follow a different industrialization path from that taken by OECD countries. For the least developed countries in particular, a dual pattern of integrated industrial growth is needed, comprising externally oriented industrial development driven by export-dominated activities integrated with a vibrant medium, small-scale and micro enterprise sector focusing on subcontracting and other supplier linkages with the external sector while also satisfying domestic demands for goods and services. Because small firms are typically more labour-intensive, the SME sector can play a vital role in poverty alleviation by generating jobs and income for the most vulnerable communities, as well as providing an essential element in the value-added chain of manufacturing industry.

369. TNC global integration strategies are driven either by a search for improved market access or the pursuit of cost advantages. Both offer opportunities for developing countries. Those countries positioned close to the United States, western Europe and Japan - i.e. Mexico, the Mediterranean and east European countries, and the second and third waves of newly industrializing economies in Asia - are exploiting their locational advantages, while low labour-cost developing countries have attracted at least some TNC manufacturing and service activities.

A growing role for SMEs

370. The rapid growth of SMEs is of critical importance, not only for the development of locally-owned industrial entities in developing countries, but for socio-economic development and the generation of employment and income on a much wider scale and the extension of industrial production over a greatly diversified base. SMEs represent the most vital and dynamic sector of growth, both to meet local demand and to develop export capability in niche areas. Apart from producing a wide range of goods, SMEs in several developing countries have built up subcontracting relationships with foreign companies and large domestic manufacturers and achieved considerable networking and cooperation among themselves via clustering and the development of industrial districts.

D. Campbell, "Foreign Investment, Labour Immobility and the Quality of Employment", *International Labour Review*, 1994.

371. Institutional support necessary for SME development covers several essential functions, including human resource development, finance, information, technology, quality standardization and certification, and inter-firm linkages, including with foreign companies. SMEs provide considerable potential for socio-economic development and for achieving export capability in niche areas. The extension of the benefits of industrial activities through job creation and increased income can be achieved both by SMEs and micro enterprises. Micro enterprises, in particular, need to be encouraged so as to achieve job generation, equitable income distribution and poverty alleviation and to bring about greater industrial dispersal to rural regions.

372. The conjuncture of disillusionment, especially in Africa but also in Latin America, with industrialization driven by capital-intensive and large-scale enterprise, and growing anxiety about the failure of such investments to generate enough jobs to keep pace with labour-force growth, has contributed to the increased recognition of the essential role of SMEs and of micro enterprises.

SME participation in exports

373. Apart from growing subcontracting relations between SMEs and larger firms in several developing countries, considerable attention has also been focused on SME participation in the globalization process because of the successful development of industrial districts and firm clusters, especially in Italy and through township and village enterprises (TVEs) in China, and growing exports through SMEs in several countries. In Taiwan Province of China, the share of SMEs in total exports is 56 per cent; in China itself more than 50 per cent; and for East Asia as a whole, about 40 per cent - more than double the estimated 20 per cent for SMEs in OECD countries.

374. SME contributions to exports take various forms, ranging from subcontracting to direct exports, sometimes via associated firms or export market intermediaries. Data from the Republic of Korea show a marked increase in direct exports, not just of traditional products like woven textiles, but also more technologically advanced items like auto parts and metal-cutting equipment.

375. In Taiwan Province of China, where industry is far less concentrated than in the Republic of Korea (the Province's ten-firm aggregate concentration ratio is 14.3 per cent of GDP while the Korean equivalent is 63.5 per cent), SME export ratios are among the highest in the world. In 15 out of 20 manufacturing sectors in Taiwan Province of China, the average firm size is less than 50 workers, while enterprises with fewer than 300 workers were responsible for two-thirds of total exports during the 1975-85 period.

376. SME export success is at least partly attributable to the advantages of "collective efficiency" obtained by clustering. Where firms in similar activities cluster together they enjoy unplanned external scope and scale economies arising from the agglomeration of firms at one location. Benefits include ready availability of raw materials, spares and components, shared access to essential specialized services and a pool of relevant labour skills. Scale effects are particularly important in export marketing, where costs are reduced.

377. Two distinct models of industrial clusters have evolved: firstly, those found in parts of Europe and synonymous with innovation, quality and flexibility; and SME exports which are driven mainly by low wages and cheap materials.

378. While most developing-country models originate from the latter model, within clusters there is evidence of innovation and upgrading, especially in response to export demand which puts a premium on design, quality and prompt delivery. Schmitz (1995) cites the way in which the Brazilian shoe industry (Box 8.1) has reacted to competition from China in the United States market by repositioning its product in higher quality market segments.[8/]

Box 8.1
Collective efficiency and industrial districts - The Sinos Valley

Clusters of specialized enterprises can compete successfully in global markets as illustrated by the success of the Sinos Valley cluster in Brazil's Rio Grande de Sul leather shoe industry. Between 1970 and 1990, Brazil's share of global trade in this sector increased from 0.5 per cent to 12.3 per cent, and it became the third largest exporter after Italy and the Republic of Korea. Much of the industry's growth was concentrated in the Sinos Valley, where in 1991, there were some 1,821 firms employing 153.000 workers, producing not just leather shoes but also components used in shoe production, in tanning and in machinery supply and repair. About half the firms employed less than 100 workers each with approximately 20 per cent of the entire workforce being employed in a subcontracting capacity underscoring the high level of inter-firm cooperation based on close geographical proximity and firm specialization.

Source: Kaplinsky, *op. cit.*, pp. 20-21.

8/ H. Schmitz," Small Shoemakers and Fordist giants: tale of a supercluster" *World Development* 23 (1) 1995.

Box 8.2
Export-oriented clusters

The Tiruppur cotton textile cluster is a dense network of some 1,500 small enterprises with a workforce of 40,000 people (1985) in the Southern Indian town of Tiruppur. In 1980, three-quarters of the SMEs were in textiles. Exports have grown dramatically since the mid-1980s, reaching $400 million in 1993. There are large firms in the cluster, networking closely with SMEs to provide rapid response to export orders.

- Clothing exports from Bangladesh have increased remarkably from $7 million in the early 1980s to $1.24 billion in 1992/93. International subcontractors buy from SMEs who produce ready-made garments, mainly around the cities of Dhaka and Chittagong, though the potential for upgrading and diversification is more limited than in Tiruppur because the foreign buyers and subcontractors are responsible for design, raw materials, finance and marketing, whereas in India more is done locally, thereby deepening the cluster.

- A large cluster of firms in Sialkot in Pakistan control a significant share of the global market for surgical instruments. Some 80 per cent of production is exported, with activity shared between large and small firms and between those manufacturing final products and those specializing in specific processes.

- In Chile, after an unsuccessful start in the mid-1980s, SMEs have successfully entered the world furniture market. The lesson of this experience is less that the SMEs were unprepared for global competition than that they managed to adjust rapidly. ASHIMAD is an association of SMEs providing market intelligence, organizing trade missions abroad and fostering links with higher education institutes to promote entrepreneurship, and design and technical courses. In 1993 an Italian consultancy group was brought in to help the industry obtain ISO 9000 quality ratings. Because export orders are much larger than those in the domestic market, inter-firm linkages developed, promoting specialization and cooperation.

Source: UNIDO Background Paper, Humphrey, *op. cit.*, pp. 24-28.

379. To date, sub-Saharan Africa has not exploited clusters, partly because structural adjustment has de-industrialized some economies. Cut-throat competition among small firms has also undermined an increasing number of such companies, as in Ghana, while the experience of clusters manufacturing African-design clothing for the United States market shows that firms have failed to meet customers' volume or delivery requirements.

The policy lesson is that clustering needs guidance and support, through governmental institutions in their early stages.

The Chinese model — Township and Village Enterprises

380. Clustering is just one route to SME development. Subcontracting is another possibility that has proved highly successful in Taiwan Province of China, while the export competitiveness of medium-sized firms in the Republic of Korea has its origins in "a relatively dense network of private and public institutions" rather than clustering.[9/]

381. China has taken the route of Township and Village Enterprises (TVEs). The number of TVEs reached 18 million in 1994, when the enterprises employed more than 100 million people, compared with 1.3 million people eleven years earlier. In 1992 there were some 85,000 export-oriented TVEs which accounted for more than half China's exports of garments, chemicals, silk, and arts and crafts.

382. In the future, SMEs, reliant on increased export market penetration by labour-intensive items, should benefit from Uruguay Round trade liberalization, although once again the gains are unlikely to be evenly distributed. Countries in Asia and possibly Latin America seem likely to take greater advantage of improved market access than African countries.

Rural industrialization

383. Rural industrialization is an attractive policy option for a number of reasons:[10/]

- Small rural firms use labour-intensive techniques and employ relatively unskilled people;
- They maximize utilization of local raw materials as well as unskilled workers;
- They are often a vehicle for developing entrepreneurship and upgrading entrepreneurial skills;
- They provide the basic needs requirements of the rural population, and
- They contribute to improved gender equality by employing a high proportion of women.

9/ W. Hillebrand, "Technological Modernisation in Korean Small- and Medium-Scale Industry—a New Success Story", in Kesser et al (eds) "International Competitiveness in Latin American and East Asia", Frank Cass, 1993.

10/ S.H. Park, *op. cit.*, pp. 13-15.

Poverty alleviation and SMEs

384. Research shows that SME support programmes can contribute substantially to job creation. In a study of five sub-Saharan economies, it was found that 43 per cent of the increase in employment during the 1980-1991 period occurred in small enterprises employing less than 50 people,[11] while in Colombia, India, Indonesia, Kenya, the Philippines, the United Republic of Tanzania and Zambia, SMEs with up to 50 workers, employ over half the industrial workforce.[12]

385. The development of small enterprise in rural areas generates jobs, helps families supplement farm incomes and provides low-cost goods and services for local consumers. Table 8.1 demonstrates that in developing economies, over half manufacturing employment is in rural areas.

Table 8.1. Percentage of manufacturing employment in rural areas, 1976-1978

Country	Year	Share of manufacturing employment in rural areas (percentage)
Sierra Leone	1976	86
Indonesia	1976	80
Sri Lanka	1971	75
Jamaica	1980	74
Ghana	1973	72
Bangladesh	1974	68
Zambia	1985	64
Philippines	1976	61
India	1976	57
Pakistan	1975	52
Taiwan Province of China	1976	49
Malaysia	1970	46
Republic of Korea	1975	30
Colombia	1978	10

Source: C. Liedholm and D. Mead, *Small Scale Industries in Developing Countries: Empirical Evidence and Policy Implications*, (USAID Washington, 1986).

386. While SME support programmes have an uneven track record, this is a policy area where potential social, as well as economic, gains are enormous. However, UNIDO's experience suggests that, in small-scale industry support programmes, there is often a trade-off between economic and social objectives. UNIDO's experience shows that the

11 Donald Mead, "The contribution of small enterprises to employment growth in Southern and Eastern Africa", *World Development* 22 (12) 1994.

12 UNIDO, Industry and Poverty Alleviation, UNIDO Background Paper for the World Social Summit, 6-12 March 1995.

pay off has been greatest "in an economy with a fairly high level of industrial development".[13/]

Industry policy, social integration and gender inequalities

387. Industrial policy must have a social dimension. The economic integration of all segments of the population, disadvantaged groups from different social, ethnic and economic backgrounds will require greater efforts than in the past. Equality of opportunity for all is a fundamental requirement.

388. In the past, efforts to absorb minority communities and marginalized groups have largely been confined to the public service, but private industry can - and should - play an increased role in helping redress social imbalances, by making specific provisions for disadvantaged groups, such as the disabled.

389. Women are a disproportionate part of the world's population living in poverty, meriting specific measures to strengthen social integration and ensure greater integration of women in industrial development. The participation of women in the workforce is greatest - 50 per cent and above - in those countries where industrialization has been most rapid and successful. In particular, export-driven growth has created high levels of demand for female workers.

390. Increased female employment in manufacturing and services contributes towards social stability by lowering fertility in high population-growth economies, improved education and literacy levels, longer life expectancy and enhanced social integration.

391. The impact of industrialization and development on women can be assessed by using the Women's Status Index (WSI) developed by the International Fund for Agricultural Development (IFAD) which shows a strong correlation with income per head in sub-Saharan Africa and Latin America though the causal relationship is unclear.

13/ UNIDO, Small-scale and rural industry development programmes in Southeast and East Asia - selected case studies, 1989.

CHAPTER 9. INTERNATIONAL INDUSTRIAL COOPERATION: UNIDO AND THE NEW PATTERN OF GLOBAL INDUSTRY

392. Increased globalization and liberalization of trade and investment, which will add to the complexities of the global pattern of industry during the next decade, will also inevitably necessitate increased specialized assistance for developing countries and transition economies from international organizations, particularly UNIDO, which is the principal organization dealing directly with accelerated industrial and technological development in these countries. Such assistance can range from advisory services with respect to policies and selective governmental intervention to correct market failures, to the development of institutional facilities and provision of specialized industrial services for local industrial enterprises.

393. Strategies and policies impacting on industrial development cover several macroeconomic issues, including those specifically related to industrial growth and involving varying degrees of State intervention. While industrial strategies are closely interlinked with macroeconomic conditions, it is important that policies and institutional measures are developed which relate specifically to industrial and technological development. It is with respect to the latter that UNIDO can, and needs to, play a key role as a catalyst, promoter and facilitator of industrial development.

394. Global economic and technological trends require more complex and realistic industrialization strategies, particularly for countries that are disadvantaged. In addition to market reform and liberalization, appropriate industrial policies for implementing such strategies are required in order to ensure the right environment for a competitive industrial sector, mainly based on private enterprise. The desirable extent of Government interventions - whether functional or selective - through a proactive industrial policy remains a matter of debate. However, there is a growing consensus on the critical role of private-sector and small-scale industry involvement, which suggests that policies must be formulated and implemented with the participation of the main actors involved. This requires an adequate capacity for analysis, dialogue and negotiations both in the Government and in the private sector, mainly through its institutions. UNIDO's long experience in this area and its unique network encompassing Governments and their institutions, private sector institutions and public and private enterprises in all regions enables the Organization to transfer experience and know-how on industrial policy-making and strategy formulation across borders.

395. Even the most advanced countries have regions that lag behind on the development path, often rural or geographically peripheral areas. In order to equalize the benefits of industrialization, policies with a specific regional dimension are required and some have been undertaken successfully in many countries. UNIDO has access to this expertise and experience in this area and is able to transmit to other clients.

396. International assistance must be considered at the three levels of strategies and policies, institutional development, and enterprise-level assistance. UNIDO is in an uniquely advantageous position to provide a comprehensive programme of assistance and services in all these three fields, and is among the few organizations equipped with

multi-disciplinary personnel, including technical experts in different fields. UNIDO also has an important field presence, both in developing countries through its country directors, and in several industrialized countries where investment promotion offices have been established. Through its field network, it is possible for UNIDO to ensure that its programmes are effectively tailored to specific country needs and priorities.

Industrial policies

397. Advisory services on industrial policies include the determination of the nature of promotional or regulatory State intervention that may be necessary in order to correct market failures or shortcomings in particular country situations. These may relate to:

- Legislation and regulations relating to foreign direct investment, technology, intellectual property rights, environmental norms and other factors impacting on industrialization;

- Guidelines and procedures for investment approval, incentives for industrial investments, fiscal and taxation measures; inflow of foreign technology; environmental standards and other critical issues;

- Policies and measures on enterprise restructuring and privatization of State-owned enterprises, including the exercise of selectivity in determining the extent of enterprise restructuring and privatization, principles governing valuation of assets and viability, assessment of likely investors, and determination of modalities, besides regulatory measures for privatized monopolies and absorption of surplus labour.

Small, medium and micro enterprises

398. UNIDO has a long and proven record with respect to the promotion of small, medium and micro industrial enterprises and can draw extensively from its global experience in this field. Its advisory and support functions for small, medium and micro enterprises (SMEs), include:

- Promotional policies for development of SMEs, including tax and financial incentives; procurement preference; provision of physical facilities, etc;

- Development of specialized institutional facilities for industrial finance for SMEs;

- Programmes for entrepreneurial and managerial training for local entrepreneurs;

- Development of institutional facilities and guidance in metrology, standards and quality control;

- Institutional support through effective industrial information systems; linkages with industrial databases, and development of clusters of SMEs in various subsectors;

- Promotion of the contacts and linkages with large-scale industries and foreign enterprises for development of joint ventures, technology licensing, buy-back and marketing arrangements, distribution facilities and franchises, and for subcontracting arrangements;

- Development of institutional capability in applied industrial research in selected subsectors; and

- Creating an overall climate for growth of local SMEs.

Technological upgrading and support

399. UNIDO has a crucial role to play in technology transfer and technological upgrading in developing countries, especially the least developed countries, as it is very well placed to facilitate the crossborder flow of ideas, information and technologies. This is one area where market failure is endemic. It is also an area where developing countries are exposed to severe competitive disadvantage, highlighting the need for UNIDO to facilitate technology transfer and assist in technology upgrading and human capital investment. Institutional assistance through UNIDO for technological development and new technological applications, including informatics and biotechnology, will be of crucial importance in most developing countries. Support facilities with respect to industrial technology can be provided by UNIDO at various levels. First, information can be provided on alternative technologies including environmentally suitable technologies and development of cleaner production centres. Second, assistance can be given in the selection and operationalization of new and modern technologies, particularly for small and medium enterprises. Guidance in the use of computer-aided designs for traditional industries, such as textiles, shoes and other consumer goods is illustrative of this approach. Third, technical support can be provided for the development of applied research capability in selected industrial subsectors and in local R&D institutions. With respect to the operationalization of new technological applications and management techniques, UNIDO can provide a package of technological support in selected priority sectors and ensure that such a package is disseminated to local enterprises, through national institutions. UNIDO can play an important role in defining emerging technological trends and assessing the likely impact of technological change in different country situations.

Promotion of foreign investment and technology inflow

400. Given the growing importance of foreign direct investment in the global economy, UNIDO's experience in investment promotion is of great value, especially for least developed countries seeking to attract foreign investment and technology flows. UNIDO's programme on investment forums, Techmarts and Investmarts has already had a considerable impact in several developing countries and regions and in transition economies. This programme can play a key role in promotion of both FDI and non-equity linkages for enterprises in developing countries. UNIDO should develop a network, where industrial enterprises can request linkages with potential partners on identified projects, which is then processed by UNIDO with a large number of foreign companies from both industrialized and developing countries. No international

institution is providing such a facility and UNIDO would be the most appropriate ag ncy to do so.

Environment and sustainability

401. The harmonization of environmental norms and factors with industrial activities is expected to assume growing importance during the next decade. Primarily through its technical expertise, UNIDO is playing a key role in achieving more sustainable industrial growth. This role is likely to become further intensified in the coming years, especially with respect to usage of environmentally suitable technologies, the development of cleaner production centres and the formulation of, and compliance with, environmental norms in various industrial subsectors.

Strengthening of private-sector organizations

402. UNIDO can and must play an important role in the strengthening of private-sector organizations dealing with industrial development. While chambers of commerce and industry bodies and associations exist in several developing countries, these have different levels of competence and representation. UNIDO needs to develop new initiatives for linkages with such institutions and private-sector associations. The strengthening of such organizations could take place through: supply of equipment, including computers; development of information systems and marketing of intelligence and foreign technology linkages through such associations; training programmes for staff and personnel of such bodies; and increased participation of association representatives in local institution-building. It is also essential that national authorities recognize the need for greater involvement of private-sector associations, as vital intermediaries for private-sector development.

Assistance to enterprises

403. While enterprise-level assistance is generally channelled through national institutions, closer linkages need to be established by UNIDO for development of competitiveness amongst developing-country enterprises. Assistance can relate to mobilization of investment; measures for local entrepreneurial development; industrial information; and linkages with foreign companies; promotion of SMEs and micro enterprises; promotional incentives and tax concessions, etc. for new investments and exports and, in general, developing the environment and climate for new industrial investments including in less developed areas. Such an exercise must largely be country-specific and can only be based on detailed knowledge of a particular economy and on close consultations and dialogue with national Governments and representatives of industrial private-sector interests.

404. It is, however, at the level of small and medium enterprises that UNIDO's role is likely to be the most crucial, firstly, with respect to the linkages it can generate with foreign enterprises; secondly, with respect to the development of both institutions and human resources, particularly new entrepreneurs and managers; and thirdly, with respect to operationalization of new technological applications and managerial techniques in various fields, which would improve the competitive capacity of such enterprises.

405. The role of UNIDO will be increasingly crucial for enhancing the role of the private sector in the changing global pattern of industrial development. Interventions of the kind proposed by UNIDO will strengthen market forces and private enterprise. Fundamentally, these aim to improve the efficiency of markets through the dissemination of information, diffusion of technology upgrading of skills, enhancement of competitiveness, twinning of potential partners, promotion of SME development and rural industrialization, and promotion of investment in industry. UNIDO has major competitive advantages and capability in this regard which need to be utilized, so that integrated industrial programmes and institutional support systems can be developed.

406. In the context of the above UNIDO has launched seven major programmes covering:

- Strategies, policies and institution-bui'ding for global economic integration;
- The linkage of industry with agriculture in Africa and the least developed countries (LDCs);
- Energy use and the environment; capacity-building for environmentally sound industrialization; the establishment of cleaner production centres; the transfer of environmentally friendly technologies; and improving the efficiency of energy use in industry;
- The enhancing of innovation, productivity and quality for international competitiveness;
- Industrial information;
- Small- and medium-sized enterprises - policies and networking;
- Rural industrialization.

407. UNIDO is uniquely positioned to provide a comprehensive programme of services and support for accelerated industrial development in developing countries and transition economies. With the emerging complex pattern of global industry in the next decade and thereafter, the demand for UNIDO's specialized services for industry are expected to be greatly enhanced. These will extend not only to policy advisory services but to institutional support services and the development of increased technological and competitive capability for industrial enterprises in these countries to compete in international markets.

List of documents

Aide-mémoire: Global Forum on Industry - Perspectives for 2000 and Beyond
Vigyan Bhawan Conference Centre, New Delhi, India, 16-18 October 1995

Plenary:

- Perspectives on industrialization: Global industrial partnerships, interdependence and competitiveness (The UNIDO Secretariat in cooperation with Tony Hawkins)
  (ID/WG.542/1(SPEC.))

- Executive Summary
  Perspectives on industrialization: Global industrial partnerships, interdependence and competitiveness (The UNIDO Secretariat in cooperation with Tony Hawkins)
  (ID/WG.542/2(SPEC.))

Panel I: State of world industry and outlook for the post-2000 period

- Issue paper: State of world industry and outlook for the post-2000 period (The UNIDO Secretariat)
  (ID/WG/542/3(SPEC.))

Panel II: New technologies, innovations and competitiveness

- Issue paper: New technologies, innovations and competitiveness (UNIDO Secretariat)
  (ID/WG.542/4(SPEC.))
  - Background paper: Technology, manufactured exports and competitiveness (Charles Cooper)
    (ID/WG.542/5(SPEC.))
  - Background paper: Foreign direct investment, technology transfer and exports of developing countries: Trends and policy implications (Nagesh Kumar)
    (ID/WG.542/6(SPEC.))*
  - Background paper: The implications of new organizational techniques for developing countries (Raphael Kaplinsky)
    (ID/WG.542/7(SPEC.))**
  - Background paper: Information and communication technologies: Growth, competitiveness, and policy for developing nations (Edward Steinmueller and María-Ines Bastos)
    (ID/WG.542/8(SPEC.))
  - Background paper: Technological change and dual economics (Charles Cooper)
    (ID/WG.542/9(SPEC.))
  - Background paper: Does new technology bode well for working women?: An evaluation and analysis (Swasti Mitter)
    (ID/WG.542/10(SPEC.))***
  - Background paper: The impact of industrial automation on industrial organization: Implications for developing countries' competitiveness (Ludovico Alcorta)
    (ID/WG.542/11(SPEC.))

Panel III: Globalization and industrial partnerships

- Issue paper: Globalization and industrial partnerships (UNIDO Secretariat) (ID/WG.542/12(SPEC.))
  - Background paper: Globalization of manufacturing activity: Evidence and implications for industrialization in developing countries (Peter Nunnenkamp and Erich Gundlach) (ID/WG.542/13(SPEC.))
  - Background paper: Foreign direct investment, technology transfer and exports of developing countries: Trends and policy implications (Nagesh Kumar) (ID/WG.542/6(SPEC.))

Panel IV: Global trade liberalization: Implications for industrial restructuring

- Issue paper: Global trade liberalization: Implications for industrial restructuring (UNIDO Secretariat) (ID/WG.542/14(SPEC.))
  - Background paper: Effects of the Uruguay Round Agreements on industrialization in developing countries (Tracy Murray) (ID/WG.542/15(SPEC.))
  - Background paper: The impact of the Uruguay Round Agreements on manufactured products of the African, Caribbean and Pacific Group (Adrian Hewitt, Antonique Koning and Michael Davenport) (ID/WG.542/16(SPEC.))
  - Background paper: Sectoral impact of the Uruguay Round Agreements: Export of textiles from Asian developing countries (Indian Council for Research on International Economic Relations) (ID/WG.542/17(SPEC.))
  - Background paper: Sectoral impact of the Uruguay Round Agreements on developing countries: Engineering goods (C. Niranjan Rao) (ID/WG.542/18(SPEC.))
  - Background paper: Sectoral impact of the Uruguay Round Agreements on developing countries: Leather industry (Nisha Taneja) (ID/WG.542/19(SPEC.))
  - Background paper: Sectoral impact of the Uruguay Round Agreements on developing countries: Pharmaceutical industry (Jayashree Watal and Anu P. Mathai) (ID/WG.542/20(SPEC.))

Panel V: Industrial policy reforms: The changing role of Governments and private sector development

- Issue paper: Industrial policy reforms: The changing role of Governments and private sector development (The UNIDO Secretariat) (ID/WG.542.21(SPEC.))
  - Background paper: Recent industrial policies in developing countries and economies in transition: Trends and impact (Katherin Marton) (ID/WG.542/22(SPEC.))
  - Background paper: Governments and industrialization: The role of policy interventions (Sanjaya Lall) (ID/WG.542/23(SPEC.))
  - Background paper: Formulating industrial policy in Africa: 2000 and beyond (Mudziviri Nziramasanga) (ID/WG.542/24(SPEC.))
  - Background paper: Industry-related services - Key to competitiveness (The UNIDO Secretariat) (ID/WG.542/25(SPEC.))

Panel VI: Environmental policies and industrial competitiveness

- Issue paper: Environmental policies and industrial competitiveness (The UNIDO Secretariat) (ID/WG.542.26(SPEC.))
  - Background paper: Environmental policies and industrial development: Are they compatible? (The UNIDO Secretariat) (ID/WG.542/27(SPEC.))

Panel VII: Employment and social aspects of industrialization

- Issue paper: Employment and social aspects of industrialization (The UNIDO Secretariat) (ID/WG.542/28(SPEC.))
  - Background paper: Industrialization in developing countries: The challenges of employment and social integration (John Humphrey) (ID/WG.542/29(SPEC.))
  - Background paper: The implications of new organizational techniques for developing countries (Raphael Kaplinsky) (ID/WG.542/7(SPEC.))**
  - Background paper: Does new technology bode well for working women?: An evaluation and analysis (Swasti Mitter) (ID/WG.542/10(SPEC.))***

Panel VIII: Industrial development and international cooperation: The future role of UNIDO:

- Issue paper: Industrial development and international cooperation: The future role of UNIDO (The UNIDO Secretariat) (ID/WG.542/30(SPEC.))

---

* Issued as background paper for panels II and III.
** Issued as background paper for panels II and VII
*** Issued as background paper for panels II and VII