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The Supervisory Panel of *Industry and Development* welcomes readers' opinions and comments, and will be glad to consider for possible publication articles relevant to the aims and scope of the journal (see "information for contributors", back cover)

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A hyphen indicates that the item is not applicable.

An em dash (--) indicates that the amount is nil or negligible.

Two dots (..) indicate that data are not available or are not separately listed.

The following abbreviations are used in this publication:

ASEAN	Association of South-East Asian Nations
GDP	gross domestic product
GNP	gross national product
MITI	Ministry for International Trade and Development
NIC	newly industrializing country or area
OECD	Organisation for Economic Co-operation and Development
SAM	social accounting matrix

INDUSTRIAL POLICY IN EAST ASIA

H. W. Arndt*

Introduction**

Around 1970 the attention of development economists and policy-makers was drawn to the remarkable success which four economies in East Asia appeared to have achieved with a deliberately export-oriented strategy. The four, commonly referred to in the press and economic literature as NICs, meaning "newly industrializing countries and areas", are: Hong Kong, Republic of Korea, Singapore and Taiwan Province of China.*** From the mid-1960s (earlier for Hong Kong) these four recorded very high rates of growth of gross domestic product (GDP) associated with even higher rates of growth of exports, especially of labour-intensive manufactures. The suggestion that other developing countries might benefit from adopting a similar strategy met with some scepticism based largely on the grounds that such an outward-looking strategy which had been suited to the conditions of rapid growth of the world economy during the 1950s and 1960s would fail in the conditions of much slower and uneven growth of the 1970s. Yet, these NICs, which were now increasingly followed in their export-orientation by the other four economies of the Association of South-East Asian Nations (ASEAN) (Indonesia, Malaysia, Philippines and Thailand), sustained and even improved on their growth performance during the turbulant 1970s.

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**This study draws largely on two sources. The first is the deliberations and proceedings of two recent conferences at which the issues were extensively canvassed: the Fifteenth Pacific Trade and Development Conference on Industrial Policies for Pacific Economic Growth, held at Tokyo, 26-29 August 1985, and a Workshop on Explaining the Success of Industrialization in East Asia, held at the Australian National University, Canberra, 10-12 September 1985. (Individual papers presented at these conferences are included in the references appended to this study.) The second source is the experience of UNIDO, distilled in its industrial development reviews and in various other studies and reports. Most of the statistical tables have been taken, with permission, from various conference papers. The sources given are those used by the authors of the papers whose contribution is gratefully acknowledged.

***The abbreviation NIC is used extensively in the literature to describe developing economies, be they countries, provinces or areas, where industrialization efforts have been particularly successful. In the present study, it refers specifically to the four countries and areas listed here.

The early 1980s led to some faltering in their economic performance, connected with recession in developed countries and other factors, and again scepticism is being voiced about the advisability of an export-oriented industrialization strategy in the years to come. Thus, it seems an opportune time to reassess the experience of all eight economies.

This study should be seen as a contribution to a continuing discussion. In the minds of many readers it will raise as many questions as it answers. Will it be possible to combine a second round of import substitution with a second round of export promotion so as to ensure the creation of a broader productive base for the industrial sectors of developing economies? Is import dependence liable to increase significantly in the next wave of more sophisticated production for export? Will this second higher level of industrial transformation call for disproportionately higher endeavours in the field of technological capability and human resource development? The prospects facing industrial policy-makers during the remaining years of this century and beyond are for increasing complexity of strategy choices that will call for a flexible, business-like set of policy measures.

After a preliminary discussion of the objectives of industrial policy, the study summarizes the statistical evidence concerning the economic performance of the East Asian developing market economies in the past three decades. It goes on to attempt to explain their success in terms of preconditions and policies, where preconditions comprise historical, cultural and political features of their societies and the external economic environment, while policies include both macro-economic policies which affect industry in general and micro-economic policies directed at particular industries, including both incentives (chiefly for export) and protection (chiefly from import competition). It concludes with an assessment of likely future trends for the East Asian NICs, of the possible lessons that other developing countries and areas might draw from their experience, and of the scope in this field for technical co-operation among developing countries.

A. Policy objectives

For the purposes of this study, industrial policy is defined broadly as covering all government intervention concerned with manufacturing industry. As such, industrial policy is a branch of economic policy and must be conceived as serving the whole range of objectives of economic policy. In developing countries, these centre on the objective of economic development, to which the promotion of economic growth is crucial, but which also comprehends a variety of non-economic objectives, such as national independence, equitable distribution of the benefits of growth, as well as cultural and political values.

Four aspects of this general statement deserve a few words of comment because of their relevance to the issues to be discussed later in this report. They are market failure as the rationale of government economic policy; the distinction between allocative and

dynamic economic efficiency as sources of economic growth; the significance of trade-offs between economic and non-economic objectives; and the role of industrialization in development.

Governments have to act in economic matters because much of what the community wants to achieve cannot be left to market forces. There are many things that markets cannot do at all, such as the maintenance of law and order, national defence and the provision of other public goods; and there are many other things that markets do inadequately, whether because of monopolies, externalities, rigidities or failures of motivation. In this sense, the need for government action, for economic policy of any kind, can be said to arise from market failure. While there are areas of policy where the need for government action is indisputable, there are others where the relative merits of government action or inaction are debatable. They will depend on the kind and degree of market failure, on the kinds of government intervention available and on the efficiency of government - the quality of leadership, the skills of policy-makers and the capability of administrators. In some circumstances, even where market failure is clearly in evidence, government intervention may fail to mend market failure as market forces take their course. "Government failure" may outweigh market failure.

Economic growth depends in large part on the most efficient allocation of given productive resources. This is one function that markets may perform more or less well. But economic growth depends also, and perhaps even more, on factors which go beyond the efficient allocation of given resources (in technical language, the function of markets is not merely to achieve the optimum allocation of resources on a given production possibility curve but also to shift this curve outward). These include increasing the quantity and quality of labour and capital, promoting technical progress and improving organization to reduce transaction, information and insurance costs. They all relate to the innovative role which in market economies is the function of private entrepreneurs but which may in some circumstances be more effectively performed by government. The relative likelihood of market and government failure needs to be assessed in relation to both the "allocative" and the "creative" function of markets.

Economic growth is only one of many objectives of national policy, in developing as in developed countries. Some non-economic objectives, such as power and prestige, defence capability or the popularity of the régime, may be dependent on or associated with a high rate of economic growth. Other socio-economic objectives, such as an equitable distribution of income, protection of vulnerable groups, self-sufficiency, regional balance, economic stability, social security, full employment and other aspects of the quality of life, may be in harmony with economic growth or attainable at the cost of lower economic growth, depending on the particular circumstances. National policy will then aim at a mix of objectives, involving some trade-off against economic growth. An industrial policy which promises the highest rate of economic growth in the short term may therefore be rejected in favour of one designed to give greater weight to some non-economic objectives,

which is not to say that it will necessarily prove the first-best, or even second-best, path to these non-economic ends. Nor can it be assumed that national policy, with its particular mix of objectives, necessarily represents a national consensus. It may be the outcome of a power struggle, or compromises, between sections of the community with conflicting, or at least divergent, interests.

Industrialization has been an invariable ingredient of policies for economic growth in almost all countries in modern times. There are economic and non-economic reasons for this. Among the economic ones are the fact that in modern economies, much consumer demand with rising incomes and almost all investment demand represents demand for the products of manufacturing industries and that manufacturing has seemed to offer the greatest scope for increasing productive capacity through technical progress. A wide range of historical and cross-country studies show rapid growth of manufacturing highly correlated with rapid overall growth of GDP. When developing countries embark on rapid industrialization, technical progress enters into the productive process to increase productivity. Rising productivity in manufacturing tends to accelerate growth in other sectors. Among the non-economic reasons for high priority for industrialization are the association of manufacturing with national security and with urban civilization. Even in countries rich in natural resources, the contribution of manufacturing to GDP surpasses that of agriculture and other primary industries at some stage of economic development. The rate of growth and efficiency of a country's manufacturing industries is therefore crucial to the performance of its economy.

There will be frequent occasion in later chapters of this report to refer back to these rather elementary propositions about the objectives of industrial policy.

B. Industrialization in the East Asian developing market economies: the statistical record

The distinguishing feature of the industrial development of the eight East Asian developing market economies is that, much like Japan in the inter-war period, they largely pursued an export-oriented strategy. Hong Kong from the start, Taiwan Province in the 1950s, Singapore after separation from Malaysia in 1965, the Republic of Korea in the mid-1960s, Malaysia and (in response to the increase in their oil import bill) also Thailand and the Philippines in the early 1970s, and even Indonesia (faced with the prospect of declining oil earnings) much more hesitantly in the late 1970s - all adopted a deliberate policy of encouraging and promoting manufacturing for export in line with their perceived comparative advantage. The strategy seems to have been spectacularly successful, most clearly so in the case of the four East Asian resource-poor economies. They not only achieved rates of economic growth matched by hardly any other developing countries, but also did relatively well in terms of income distribution and other criteria of development.

Table 1 compares average rates of growth of GDP and gross national product (GNP) per capita of these eight economies with the average for low-income, middle-income and all developing countries during the two periods 1950-1965 and 1965-1983. Three facts stand out. First, in all the East Asian economies, except Indonesia and Malaysia, the rate of growth of GDP was even in the earlier period above, and in the cases of Hong Kong and Singapore well above, the average of middle-income countries. Secondly, from the mid-1960s when the other four ASEAN economies also adopted increasingly export-oriented industrial policies, growth accelerated in all of them, except the Philippines. Thirdly, in the second period, in terms of growth of per capita income, all eight except the Philippines did better than the average of middle-income developing countries, and the four NICs achieved growth rates of per capita income almost twice the average of middle-income countries.

Table 1. East Asian developing market economies: average annual GDP and GNP per capita growth, 1950-1983

Economy or economic grouping	GDP growth 1950-1965 (percentage)	GDP growth 1965-1983 (percentage)	Per capita GNP growth 1950-1965 (percentage)	Per capita GNP growth 1965-1983 (percentage)	Per capita GNP 1983 (dollars)
Singapore	5.5 a/	10.3	5.5 a/	7.4	6 620
Hong Kong	10.1	8.7	5.5	6.2	6 000
Taiwan Province	5.7 b/	8.9	4.9 b/	6.7	2 677
Republic of Korea	5.7	8.6	3.3	6.7	2 010
Malaysia	4.7	7.1	1.7	4.5	1 860
Thailand	6.3	7.4	3.3	4.3	820
Philippines	6.1	5.4	2.9	2.9	760
Indonesia	3.2	7.5	1.1	5.0	560
Low-income developing countries	4.0	5.3	2.0	2.7	260
Middle income developing countries	5.0	5.8	2.4	3.4	1 310
Developed countries	4.6	3.4	3.4	2.5	11 060

Sources: [1]; [2], 1985; [3].

a/ 1960-1965.

b/ 1952-1965.

Table 2 puts the growth record of the East Asian economies in another illuminating perspective by comparing it with that of various other economic groupings during the three periods 1960-1973, 1973-1980 and 1981-1983. The interest of table 2 lies in three

Table 2. Growth of GDP per capita by economic grouping, 1960-1983

Economic grouping	Population, 1980 (millions)	GDP per capita, 1980 (dollars)	Average annual real percentage growth rate of GDP per capita				
			1960-1973	1973-1980	1981	1982	1983
Low-income countries	2 098	260	3.2	3.0	2.1	2.9	5.1
Asia	1 901	260	3.6	3.4	2.6	3.4	5.9
China	980	290	6.1	4.5	1.6	5.7	7.6
India	687	240	1.3	1.8	3.6	0.4	4.1
Africa (south of Sahara) a/	197	270	1.2	0.0	-1.5	-2.3	-2.3
Middle-income countries	1 073	1 550	3.9	2.8	-0.0	-1.0	-1.3
East Asia	322	960	4.7	5.5	4.7	1.5	3.6
Middle East and North Africa	159	1 500	4.7	1.4	-3.9	4.1	6.6
Africa (south of Sahara) a/	129	900	2.9	0.8	-4.3	-5.2	-6.6
Southern Europe	91	2 340	5.0	3.1	0.5	0.7	-0.8
Latin America and Caribbean	344	2 040	3.3	2.9	-0.6	-3.2	-5.1
Middle-income oil importers	579	1 690	3.8	3.3	-0.0	-1.4	-1.5
Middle-income oil exporters	494	1 400	4.1	2.2	-0.1	-0.5	-1.1
All low- and middle-income developing countries	3 171	700	3.8	3.1	0.7	0.2	0.4
High-income oil exporters	16	14 090	6.1	2.3	-4.3	-5.9	-11.0
Developed countries	714	10 420	3.9	2.1	0.7	-0.9	1.6

Source: [1].

a/ Excludes South Africa, which, however, is included in subtotals and totals. The total income of this group of countries is dominated by that of Nigeria (with about 60 per cent of the income of the

main facts. First, growth in the East Asian group of economies accelerated after the first oil shock in 1973 and 1974, while growth in all other categories (except India) slowed down, including and especially in developed countries. Secondly, and partly in consequence, the average rate of growth in the East Asian economies during the latter period was almost twice that of all middle-income economies and nearly three times that of the OECD countries. Thirdly, growth in East Asian countries contracted in 1981 and especially in 1982; a revival of growth occurred in 1983, but growth was lower than in China, India and the (oil-producing) middle-income countries of the Middle East and North Africa.

No less striking is the contrast presented in table 3 between the market economies of East and South Asia during the 1970s. The much more open economies of East Asia, with ratios of exports and imports to GDP of 50 per cent or more in the NICs and, by the end of the decade, at least 25 per cent in the ASEAN countries, attained consistently higher growth rates than the generally more inward-looking countries of South Asia.

Tables 4, 5 and 6 highlight the very rapid rates of growth of exports of manufactures attained by all eight economies on average over the period 1960-1982, but they also bring out the marked differences in stage of industrial development between the four resource-poor NICs and the resource-rich ASEAN economies. In 1960 the role of manufacturing in the economy, as indicated by its contribution to GDP, had become substantial only in Hong Kong and the Philippines, which had embarked on industrialization in the 1950s. By the end of the period, the contribution in the four East Asian economies (and the Philippines) had reached or surpassed the (by now lower) figure for developed countries, but it was still significantly lower in the other ASEAN countries, especially Indonesia. By 1983, 90 per cent or more of the exports of the NICs consisted of manufactures (if Singapore's oil refinery products are included). Among the other four ASEAN economies, in contrast, primary commodities, though diminishing in importance, continued to predominate.

Purely statistical evidence of the kind presented in the preceding tables can at best suggest, but not prove, that the high rates of growth attained by the East Asian developing market economies were the result of their export-oriented industrialization strategies. But there are econometric studies, by B. Balassa and others, which lend strong support to this conclusion (Balassa [10], Krueger [11]). Why there should be such a causal relationship is an important question to be discussed later.

Tables 7 and 8, finally, give some indication of the relative performance of the East Asian NICs in terms of social development, using income distribution, female life expectancy and secondary school enrolment as relevant indicators. All four NICs appear above the other four ASEAN economies in a rank order of 34 developing economies in terms of the degree of equality of income distribution, with Taiwan Province standing out in first place and Malaysia and the Philippines well down the list. But if the criterion is "growth with equity", combining the criteria of growth

Table 3. Estimated real growth rates of various economies, or economic groupings, 1965-1984

Economy or economic grouping	Percentage growth rate of real GDP				Per capita GNP	
	Average annual growth rate 1970-1982	1982	1983	1984	1983 a/ (dollars)	Average annual growth rate 1965-1983 (percentage)
NICs						
Hong Kong	9.9	2.2	5.2	9.6	6 000	6.2
Republic of Korea	8.3	5.5	9.5	8.5	2 010	6.7
Singapore	8.5	6.3	7.9	9.1	6 620	7.8
Taiwan Province	8.8	3.4	7.3	10.6	2 670	
ASEAN						
Indonesia	7.7	2.2	4.2	5.0	560	5.0
Malaysia	7.7	5.6	5.8	6.9	1 870	4.5
Philippines	6.0	3.0	1.0	-3.9	760	2.9
Thailand	7.1	4.1	5.8	6.0	820	4.3
South Asia						
Bangladesh	4.1	0.8	3.3	3.9	130	0.5
Burma	5.0	6.0	5.5	6.3	180	2.2
India	3.6	1.8	8.0	4.5	260	1.5
Nepal	2.7	3.8	1.4	7.4	170	0.1
Pakistan	5.0	4.4	6.5	4.4	390	2.5
Sri Lanka	4.5	5.2	4.7	5.2	330	2.9
China	5.6	7.3	5.1	12.0	310	4.4
World	3.0	0.0	1.9	..	..	..
Developed countries	2.7	-0.1	2.4	4.4	..	..
United States	3.1	-2.1	3.7	6.8	14 093	..
Japan	4.6	3.3	3.0	5.3	9 695	..
Non-oil-exporting developing countries	5.1	0.6	0.7	..	..	..
Africa	3.7	-0.4	-0.7	..	..	..
Europe	5.3	2.3	2.2	..	..	..
Middle East	6.5	4.3	..	..	..	..
Western hemisphere	5.4	-1.5	-2.1	3.4	..	..

Sources: [2], 1984 and 1985; [4], April 1983, April 1984 and April 1985; [5]

a/ World Bank Atlas methodology, 1981-1983 base period, rounded to t nearest ten.

Table 4. East Asian developing market economies: annual export volume growth rates, 1960-1982 (Percentage)

Economy	Total exports 1960-1982	Manufactured exports 1960-1982
Hong Kong	9.8	11.7
Indonesia	8.6	28.5
Malaysia	4.4	11.2
Philippines	3.9	17.1
Republic of Korea	26.4	38.3
Singapore	7.3	12.1
Taiwan Province	17.5	24.4
Thailand	7.0	21.6

Sources: [1]; [2], 1985; [6].

Table 5. East Asian developing market economies and other economic groupings: distribution of GDP and employment by sector, 1960 and 1983 (Percentage)

Economy or economic grouping	Agriculture		Other industry		Manufacturing		Services	
	1960	1983	1960	1983	1960	1983	1960	1983
Hong Kong	4	1	13	8	26	22	57	69
Indonesia	54	26	6	25	8	13	32	35
Malaysia	36	21	9	16	9	19	46	44
Philippines	26	22	8	11	20	25	46	42
Republic of Korea	37	14	6	12	14	27	43	47
Singapore	4	1	6	13	12	24	79	62
Taiwan Province	33	9	8	10	17	34	42	47
Thailand	40	23	6	8	13	19	41	50
Low-income developing countries	50	37	6	20	11	14	33	29
Middle-income developing countries	22	15	9	15	22	21	21	49
Developed countries	6	3	10	11	30	24	54	62

Sources: [2], 1979 and 1985; [3].

Table 6. East Asian developing market economies and other economic groupings: the commodity structure of exports, 1955, 1965 and 1982
(Percentage shares)

Economy or economic grouping	Fuels, minerals and metals			Other primary commodities			Textiles and clothing			Machinery and transport			Other manufactures		
	1955	1965	1982	1955	1965	1982	1955	1965	1982	1955	1965	1982	1955	1965	1982
Hong Kong	4	2	2	23	11	6	50	43	34	--	6	19	23	37	39
Indonesia	36	43	85	63	53	11	1	--	1	--	3	1	--	1	2
Malaysia	23	35	39	72	59	42	--	--	3	1	2	15	1	4	5
Philippines	10	11	12	80	84	38	8	1	7	--	--	3	2	5	39
Republic of Korea	31	15	1	50	25	7	15	27	21	--	3	28	2	29	43
Singapore	..	21	30	..	44	13	..	6	4	..	10	26	..	18	28
Taiwan Province	2	5	--	87	56	6	6	15	30	--	4	31	4	20	33
Thailand	15	11	7	83	84	64	--	--	10	--	--	6	1	4	13
Low-income developing countries	13	11	20	70	85	80	12	16	18	--	1	5	5	7	28
Middle-income developing countries	25	36	37	61	48	21	4	4	8	2	3	11	8	10	23
Developed countries	11	9	12	23	21	14	7	7	4	30	31	37	29	32	32

Sources: [2], 1980 and 1985; [3], [7], [8] and [9].

Table 7. Income distribution and growth of the East Asian economies relative to a sample of 34 developing countries, 1983

East Asian economy	Rank out of sample a/ of 34 developing countries or areas		
	Income distribution	Income distribution and GDP growth	Income distribution and per capita growth
Taiwan Province	1	1	1
Singapore	5	2	2
Republic of Korea	8	4	3
Hong Kong	11	5	4
Indonesia	15	8	8
Thailand	16	10	9
Malaysia	26	16	14
Philippines	22	17	17

Source: [2], 1985.

a/ See source for a description of the sample.

Table 8. East Asian developing market economies and other economic groupings: changes in longevity and secondary school enrolment, 1965, 1982 and 1983

Economy or economic grouping	Female life expectancy in years		Percentage decline in longevity shortfall a/	Percentage of secondary school enrolment		Percentage decline in enrolment shortfall b/
	1965	1983	1983	1965	1982	1982
Hong Kong	71	78	77.8	29	67	53.5
Indonesia	45	55	28.6	12	33	23.9
Malaysia	59	69	47.6	28	49	29.2
Philippines	58	66	36.4	41	64	39.0
Republic of Korea	58	71	59.1	35	89	83.1
Singapore	68	75	58.3	45	66	38.2
Taiwan Province	70	75	50.0	53	98	95.7
Thailand	58	65	31.8	14	29	17.4
Low-income developing countries	51	60	31.0	20	32	15.0
Middle-income developing countries	55	63	32.0	20	42	27.5
Developed countries	74	79	83.3	71	87	55.2

Source: [2], 1985.

a/ Shortfall from the maximum attainable, which is assumed to be 80 years.

b/ Shortfall from 100 per cent enrollment.

and distribution, all eight economies are in the top half of the sample, with the four NICs occupying the first four places. Much the same pattern emerges from the comparisons of life expectancy and school enrolment, both in terms of absolute levels and improvement, but here it is Indonesia that, despite notable impovement, still trails most behind.

Generalizations based on summary statistics inevitably oversimplify the picture. There have obviously been very great differences in structure and policy between the four resource-poor NICs and the resource-rich ASEAN economies with their large agricultural sectors. Even among the former, Hong Kong and Singapore are somewhat special cases, as traditional entrepôt trading centres naturally predisposed to outward orientation. While all eight economies can be said to be more market-oriented and open than most other developing economies, the role of Government in the economy, in all of them except Hong Kong, has been pervasive, Indonesia in particular, despite moves towards deregulation, remaining a highly controlled economy. Even within each group, there are considerable differences in per capita income, with Hong Kong and Singapore enjoying an average more than three times that of the Republic of Korea, and Malaysia more than three times that of Indonesia. While Hong Kong and Singapore have throughout permitted free trade in imports as well as exports, the domestic market for many manufactures has remained effectively protected in most of the other economies. Inflation has been well contained in Hong Kong, Malaysia, Singapore, Taiwan Province and Thailand, but there have been serious bouts of it in Indonesia, the Philippines and the Republic of Korea.

Correspondingly, although all eight currently rank as middle-income economies, they have been remaining at different stages of economic development and, as has been mentioned, they embarked on export-oriented industrial development at different times. All the East Asian NICs began with the traditional products, textiles, clothing, footwear and other labour-intensive products, such as plywood, furniture and processed food, which made the most of their initially low wages. These also, together with electronics assembly, predominated among the manufactured exports of the second generation, Malaysia, the Philippines and Thailand during the 1970s. The Republic of Korea, in contrast, early emphasized heavy industries, such as shipbuilding and iron and steel, and Hong Kong, Singapore and Taiwan Province, as rising real wages made them less competitive in labour-intensive exports, have sought to move into more skill- and technology-intensive products. Meanwhile, Indonesia has tried, so far only with modest success, to gain export markets in a limited range of labour-intensive manufactures, chiefly clothing, electronics assembly and plywood.

Any generalization about these eight economies therefore requires qualifications to allow for variations in their circumstances and experience. But the fact that all of them have enjoyed remarkably high rates of economic growth associated with export-oriented industrial development is not really in dispute. The debatable questions are how far their good economic performance can

be attributed to the policies that were adopted rather than to special circumstances; whether the policies that were successful during the 1960s and 1970s can be expected to succeed equally well in the 1980s and 1990s; and whether the experience of the East Asian NICs is transferable to other developing countries.

In debating these issues the protagonists of the export-oriented strategy usually claim that the East Asian NICs did well because they adopted appropriate policies. The critics, even when they are prepared to concede this, have tended to argue that the East Asian economies were able to adopt these policies and carry them out so successfully only because of specially favourable preconditions, both in the domestic features of their societies and the external environment, the state of the world economy. In discussing these issues in the following sections, it will be convenient to reverse the order, beginning with the preconditions, domestic and international, and then discussing policies.

C. Preconditions: historical, cultural, political

At least seven features of the domestic setting of the East Asian developing market economies, the history, social structure, politics and culture of their societies, have been put forward in partial explanation of the success of their outward-looking industrial policies. It is readily admitted that not all these features apply to all eight economies, and that at best they apply to them in widely varying degree. But it is claimed that, collectively, they have constituted a necessary, if not sufficient, condition of success.

The seven features - listed without any implication of order of importance - are small size, poor natural resource endowment, external threat, predominance of growth objective, prior elimination of obstructive interests and institutions through foreign colonial rule or military occupation, authoritarian political régimes and, finally, a common Confucian culture and ethic.

Small size. An open economy and an export-oriented industrial policy, it is argued, are unavoidable for very small countries and easier and more advantageous for small than for large countries. A very small country is inevitably dependent on the rest of the world for most requirements beyond those of the simplest subsistence, and the small domestic market of a small country limits the scope for efficient industrial production for that market based on economies of scale. At the same time, a small country is likely to find it easier than a large one to pursue an export-oriented industrial policy because its exports will generally claim a smaller share of the world market; they will therefore face a more price-elastic demand and are less likely to run into barriers or retaliation.

All these considerations are very relevant to Hong Kong and Singapore. For neither of these economies was an inward-looking industrial policy aimed at the domestic market a practicable alternative (or at any rate a sensible one - there are many countries in Africa no larger than Hong Kong and Singapore which continue on this counter-productive course). They are much less relevant to

the other two NICs or to the other four ASEAN economies. As table 9 shows, three of the latter four, the Philippines, the Republic of Korea and Thailand, are large countries, comparable in population to France and the United Kingdom. One, Indonesia, is the fifth largest country in the world. Malaysia and Taiwan Province are commensurate with Australia, Canada or the Netherlands. Population, of course, is not the only relevant index of size. A low per capita income limits the size of the domestic market, and in the early stage of export-oriented industrial development, the exports even of quite a large country are likely to constitute a very small proportion of world trade in any one product. For both these reasons, Indonesia, for example, still has the characteristics of a small country for many purposes of industrial policy. What remains true and relevant even for the larger East Asian market economies, is that the relatively small size of the domestic market offers limited opportunities for continuous pursuance of pure import-substitution; an inward-looking policy was liable to run within a decade or so into saturation or slow growth of the domestic market for even the most widely consumed manufactures.

Table 9. Population in East Asia, South Asia and selected developed countries, 1983
(Millions)

East Asia		South Asia		Selected developed countries	
Indonesia	156	India	733	United Kingdom	56
Philippines	52	Bangladesh	96	France	55
Thailand	49	Pakistan	90	Canada	25
Republic of Korea	40	Burma	36	Australia	15
Taiwan Province	19	Sri Lanka	16	Netherlands	14
Malaysia	15	Nepal	16	Sweden	8
Hong Kong	5			New Zealand	3
Singapore	3				

Source: [2], 1985.

Poor natural resource endowment. "Lucky is the country that has no mining sector and few farmers" or, in the formulation of a law attributed to the Yale economist, Gustav Ranis, "a country's development prospects are inversely proportional to its natural resource endowment". The paradox derives what plausibility it has very largely from the outstanding economic performance of the mineral-poor, land-scarce economies of East Asia, first Japan and then the four NICs.

There are both economic and broader cultural arguments for Ranis's Law. The economic argument, with specific reference to industrial development, is a long-term counterpart to the short-term "Dutch disease" problem. The latter refers to the squeeze on

other traded-goods industries exerted by upward pressure on the real exchange rate due to a sudden increase in mineral (for example, oil) export earnings. Its long-term equivalent is the effect of an ample endowment with exportable natural resources in maintaining, ceteris paribus, a relatively favourable balance of payments or high real exchange rate and thus keeping down the international competitiveness of other traded-goods industries, including manufacturing industries. It is merely another way of saying that such a country has a comparative advantage in the production of primary commodities and a comparative disadvantage in manufacturing at large. This, it should be stressed, does not preclude the development of a comparative advantage in specific manufacturing industries or products through technological innovation or some other source of economic efficiency.

The cultural case for Ranis's Law is simply the temptation of "lotus-eating". Countries with an ample endowment of natural resources do not have to work so hard at doing well economically, or they may think so. Countries which lack natural resources must make the most of their human resources - capacity for hard work, discipline, thrift, skills, enterprise.

There is no doubt that Japan and the East Asian NICs have displayed these qualities in remarkable degree, nor have their manufacturing industries had to contend with a long-term form of the handicap referred to above. In Indonesia, in contrast, ample oil revenues for most of the 1970s reduced both the need and the ability to develop internationally competitive manufacturing industries; and the rhetoric on the theme that "we are a rich country" frequently heard in the Sukarno era may have contributed to an inclination to give economic problems relatively low priority. But it is difficult to see much relevance of this argument to the experience of Malaysia, the Philippines or Thailand. Ranis's Law is at best suggestive. There are many resource-poor countries that have done badly and resource-rich countries that have done well.

External threat. The perception of external danger, struggle for national power or survival, have been powerful motives for economic development. Many examples, not least Japan from the Meiji restoration onwards, spring to mind. In some countries, the national leadership has continuously and effectively used the need to strengthen the country against external threat as a means of mobilizing national energy and giving rapid economic and particularly industrial development high priority among national objectives. Just as the high standing in the European growth league tables of the 1950s and 1960s of the three countries defeated in the Second World War, Austria, Germany and Italy, has been attributed in part to the desperateness of their economic situation at the end of the War and to the destruction of so much of their capital stock which compelled them to start again and gave them the advantage of working with the most up-to-date equipment in many industries (United Nations [12]), so similar factors may have been at work in the Republic of Korea and Taiwan Province (Scitovsky [13]). A perceived external threat also led to the allocation of much of each country's productive capacity to military expenditure,

at the expense probably of private consumption and social welfare, but industrial development, especially in heavy and engineering industries, may have derived some impetus from a hidden defence agenda.

The experience of the other six East Asian developing market economies, however, demonstrates that perception of an acute external threat, while perhaps helpful, is not necessary for an effective and successful development effort. It played no part in Hong Kong where the incentive seems to have come entirely from the desire of private individuals and families to improve their material condition, nor more than quite marginally in the other economies, where the national leadership found other themes on which to rest its appeal for individual and collective effort.

Predominance of growth objective. Certainly, whatever the motive or the rhetoric, the fact that rapid economic growth ranked high among national policy objectives in all these economies was an important, even necessary, condition of success. All of them for two or three decades gave priority to economic growth over social welfare spending. If most of them devoted considerable resources to education, and largely to government-financed education, and Hong Kong and Singapore also to public housing, they did so in large part because they regarded both as growth-promoting capital formation. Protection of vulnerable or minority groups, or deliberate redistributive policies for egalitarian objectives, played a quite minor part in the mix of policy objectives in most of them, Indonesia and Malaysia with their programmes for the protection and promotion of indigenous (pribumi or bumiputra) vis-à-vis overseas Chinese business being the most important exceptions. By the late 1970s, with increasing affluence in the most advanced of the East Asian NICs, there were signs that these priorities were beginning to change. As long ago as 1972, a senior minister in the Singapore Government said there were some, intellectuals mostly, who thought that the Government's stress on national achievement was overdone (Goh [14], p. 193). Even in Indonesia, questioning among intellectuals of too single-minded a pursuit of economic growth led to the formulation in the Third Five-year Plan of an "eightfold path" towards greater emphasis on social justice and the quality of life (Booth and Tyabji [15], p. 37).

Prior elimination of obstructive interests and institutions through foreign rule. The strongest case for the view that colonial rule or foreign occupation has helped lay the foundations for rapid industrial development can be made in the cases of the Republic of Korea and Taiwan Province. In Taiwan Province, during the period of Japanese colonial rule, and in both economies as well as in Japan under post-war United States occupation, land reforms and the creation of rural infrastructure and institutions made an important contribution by reducing the power of a potentially conservative landlord class and providing a sound agricultural base for industrial development (Haggard [16]). It might also be argued that Malaysia and Singapore benefited by inheriting from the colonial period an efficient government apparatus and civil service. But the legacy of colonial rule often had negative features, such

as the lack of educational institutions and consequent shortage of professional and other skills and the lingering hostility to free markets in Indonesia. It will hardly do to attribute success in the Republic of Korea and Taiwan Province to the presence and in Japan and Thailand to the absence of a colonial past.

Authoritarian régimes. A much more plausible case can be made for the view that rapid economic development in the eight East Asian developing market economies owed much to the fact that all of them have had authoritarian political régimes of varying shades of rigour. The eight have been characterized as "insulated developmentalist states" in which "the economic policy-making process was relatively insulated from direct political pressures" by sectional interest groups. It is worth quoting a few lines which summarize the argument: "The weakness of labour and the co-optation of the peasantry, coupled with periods of repression and economic success itself, contributed to a broader political phenomenon that differentiates the East Asian cases from other developing countries: a relative vacuum on the left. ... It is an important irony that economic development in East Asia has been more egalitarian than in Latin America, South Asia or Africa where leftist and populist parties and labour movements have periodically exerted strong political and ideological influence on government policy" (Haggard [16]).

It would be idle to deny that the relative weakness of rent-seeking groups (Krueger [17]) or distributional coalitions, which have so powerful an influence on economic policy in the developed market economies, has assisted the more single-minded pursuit of economic development in the East Asian economies. The lack of serious pressure of competing income claims has made it easier to pursue prudent macro-economic policies; the trade unions have contributed to creating a co-operative labour force; and even business interests have found it to their advantage to go along with government policy. But the force of this argument, too, can be overstated. Far more authoritarian régimes in the third world have been unsuccessful than successful in their policies of economic development. In Hong Kong, trade unions have been free to organize and strike but have received little support from workers (Riedel [18], quoting Turner). Singapore trade unions had few grievances while real wages were rising at 5 per cent or more a year. It could be argued that the causal relationship ran in part the other way. The political legitimacy and stability of the East Asian authoritarian Governments rested in large part on the successes of their economic policies.

Confucian culture and ethic. There is, finally, the widely entertained hypothesis that the success in economic development of the East Asian economies, including Japan, is largely to be attributed to their common Confucian culture and ethic. "What many argue distinguishes the East Asian countries, in particular the NICs, is the quality of their labour force. Diligence, loyalty, hard work and a strong appreciation of education are virtues which appear to be more abundant in East Asian NICs than elsewhere" (Riedel [18], p. 27). Others would add respect for authority, age and officialdom, and social cohesion, subordination of individual

interests to those of the family or the nation resulting, particularly in the Japan model, in co-operative labour-management, inter-firm and government-business relations (Hirono [19]).

There can be no doubt that the qualities displayed by the people of these countries and areas - their energy, skills, enterprise and not least their respect and demand for education - have played an important role in their exceptionally rapid economic growth. The trouble, however, with such cultural explanations of economic performance, as with the climatic theories that were once popular, is that they can explain almost anything. They have a flavour of ex post rationalizations. It is doubtful whether they are good predictors. "Why were the advantages of a Confucian heritage just discovered only in the last five or ten years?" (Riedel [18], p. 28). For long, western scholars attributed to Confucianism, with its low regard for money-making and technology, its conservative and hierarchical values, the decline of China. There is much evidence, from all parts of the world, that culture adapts to economic opportunity. The Javanese peasants whom the Dutch scholar, J. Boeke, thought incapable of behaving like economic men responded with alacrity when high-yielding varieties promised sure increases in yields (Garnaut and McCawley [20]). A class of industrial entrepreneurs emerged within a few years when landowners in Taiwan Province were compensated in the land reforms of the early 1950s with shares in former Japanese manufacturing enterprises (Steinhoff [21]).

Much the same applies to all seven of the alleged domestic preconditions which have been discussed in the preceding pages. All of them have some plausibility in relation to some, if not all, the eight East Asian developing market economies. But there are too many counter-examples - countries which shared some or all of these features and did not do well, others which lacked some or all and performed creditably. Clearly, such preconditions are not a sufficient condition of successful industrialization and they may not even be necessary, though all of them can be helpful. What, above all, distinguishes them from economic policies is that in their very nature they are largely given, possibly slowly emulated, but not easily adopted by an effort of political will.

D. Preconditions: the external environment

The second set of favourable preconditions which have frequently been said to explain in large part the success of the export-oriented industrial development of the East Asian developing market economies have to do with their external environment. Of course, since the international economic environment has been broadly the same for all developing countries, it cannot as such account for the fact that some have been so much more successful than others. The very success of the East Asian NICs is, in itself, a prima facie refutation of the view that the problems of the developing countries are due to the existing international economic order. It is arguable that the international economic environment benefited these NICs in specific ways. Three arguments along these lines are worth discussing. First, NICs had the good fortune to

embark on the experiment in the two decades of exceptionally rapid growth of the world economy and international trade, the 1950s and 1960s. Secondly, as exporters of labour-intensive manufactures, they had the field to themselves for much of the period. Thirdly, they enjoyed exceptional external support through aid and direct foreign investment.

The main answer to the first point was mentioned earlier. The rate of growth of exports of manufactures and of GDP of the East Asian NICs, far from slowing down in the turbulent 1970s, actually accelerated. Table 10 shows that during the decade 1970-1979 total exports of the eight East Asian developing market economies grew at an annual average rate of nearly 30 per cent and exports of manufactures at well over 30 per cent, compared with rates of around 15 per cent for South Asia and around 20 per cent for the world as a whole. Nor did protectionist pressures, which undoubtedly intensified as unemployment rose in developed countries during the 1970s, seriously impede the growth of exports of manufactures by the East Asian developing economies, chiefly because the United States market remained relatively open (Hughes and Krueger [23]). Clearly, earlier fears that the economies whose export-oriented industrialization strategy had proved so successful during the period of relatively smooth and rapid growth of the world economy before 1970 would prove vulnerable during the disturbed decade of oil shocks and slow-down of growth in the OECD countries proved groundless.

While broadly valid, this answer is in need of some qualification. First, the high rates of growth of total exports of some of the South-East Asian economies, especially Indonesia and Malaysia, largely reflected booming earnings from oil and some other primary commodities. Secondly, the high rates of growth of exports of manufactures, again especially in the case of Indonesia, were from a very small base. Thirdly, growth of GDP and exports in all these economies did slow down in the early 1980s, in response to the second oil shock and the prolonged international recession. Most of them (except Malaysia and the Republic of Korea) actually experiencing a decline in export earnings in 198[illegible] As the United States economy recovered strongly in 1984, exports and growth in the East Asian NICs and in Malaysia and Thailand also bounced back, but remained subdued in Indonesia, largely because of sagging oil prices, and depressed in the Philippines because of mounting economic and political trouble (UNIDO [24], [25] and [26]). In 1985, all the East Asian NICs and especially Singapore, ran into serious economic difficulties which clouded the prospects for the rest of the 1980s. These developments and their implications will be examined further in the last section of this study. Meanwhile, however, it must be granted that, despite the good record of the 1970s, no final verdict can as yet be rendered on the degree of vulnerability of export-oriented developing countries to disturbance in the world economy.

The argument that the East Asian NICs did so well with export-oriented industrialization because they had the field to themselves is also at best a half-truth. These NICs were clearly not the

Table 10. Growth of total and manufactured exports of Asian developing economies and other economic groupings, 1970-1984
(Percentage)

Economy or economic grouping	Annual growth rate of total exports					Annual growth rate of manufactured exports a/	
	1970-1979	1979-1981	1982	1983	1984 b/	1970-1979	1979-1981
NICs	28.5	19.2	-1.1	8.2	20.1	29.7	19.8
Hong Kong	22.1	19.9	-3.7	4.6	29.0	22.0	19.5
Republic of Korea	37.9	18.9	2.6	9.1	19.6	39.2	18.6
Singapore	28.0	19.3	-0.9	5.0	10.2	33.0	20.8
Taiwan Province	30.8	18.7	-2.3	13.6	21.3	34.2	20.7
ASEAN c/	26.2	15.0	-4.1	0.1	9.4	39.4	15.5
Indonesia	34.9	23.6	-6.2	-5.3	3.4	47.4	28.1
Malaysia	23.3	3.1	2.3	17.4	15.3	38.0	9.0
Philippines	17.6	11.5	-12.3	-1.8	9.1	33.8	17.0
Thailand	25.2	15.1	-1.2	-11.3	16.1	47.1	20.0
South Asia	15.7	7.4	1.5	8.2	..	17.2	..
Other NICs d/	20.1	13.2	-5.5	3.7	..	24.1	23.7
Other developing countries	23.7	16.0	-16.2	-13.1	..	23.5	14.8
World	20.6	10.0	-7.2	-2.4	..	19.7	17.4

Sources: [4], April 1985; [22]; Commodity Trade Statistics 1970, Statistical Papers, Series D, vol. XX, Nos. 1-3, 1-10, 1-36, 1-46, 1-49 and 1-50 (ST/STAT/SER.D/67); Commodity Trade Statistics 1981, Statistical Papers, Series D, vol. XXXI, Nos. 1-4, 1-10, 1-11, 1-15, 1-18, 1-19, 1-21, 1-22 (ST/ESA/STAT/SER.D/89); The Trade of China (Taiwan District) 1981 (Taipei, Statistical Department, Inspectorate General of Customs, 1981); Direction of Trade Statistics Yearbook 1984 (Washington, D.C., International Monetary Fund, 1984).

a/ Standard International Trade Classification 5+6-67-68+7+8.
b/ Preliminary figures.
c/ Excluding Singapore.
d/ According to the 1979 OECD definition: Argentina, Brazil, Greece, India,

first Asian economies to industrialize. Not only Japan but also India began to industrialize in the 1860s. During the second half of the nineteenth century India's industrial growth had averaged 10 per cent a year and in the last three decades before 1914 exceeded that of Germany. In conditions of relatively free trade, India had developed the world s fourth largest cotton textile industry and second largest jute manufacturing industry by 1914, when modern manufactures accounted for 20 per cent of Indian exports. Indian industrial growth slowed down during the years between the First and the Second World War under the impact of protectionist policies at home and abroad, and even more with the industrial policies adopted after independence (Lal [27]). In 1950 the East Asian economies were industrially well behind India. What advantage the Republic of Korea and Taiwan Province had gained in industrial development during the Japanese colonial period was largely destroyed by war (Riedel [18], p. 30).

A major reason for the success of the four East Asian NICs in expanding their exports of textiles and other labour-intensive manufactures during the 1960s and early 1970s was structural adjustment in Japan. During the inter-war period, Japan with its low unit labour costs had become the largest exporter of such products and it regained this position during the 1950s. But as real wages rose rapidly, it increasingly lost this source of comparative advantage. It responded in part by relocating labour-intensive industries to the Republic of Korea, Taiwan Province, and other developing economies and partly by moving out of labour into capital- and technology-intensive industries. A considerable part of the expansion of exports of manufactures by the East Asian NICs during the 1960s and 1970s was achieved not through overall increase in demand for such products in developed countries but by their taking over markets, both in developed countries and in other developing countries vacated by Japan (see table 11).

Table 11. East Asia's share of world exports of labour-intensive manufactures, 1962-1981
(Percentages)

Economy or economic grouping	1962-1968	1969-1971	1972-1976	1977-1981
Japan a/	13.17	12.95	9.64	5.93
Hong Kong, Republic of Korea, Taiwan Province	4.23	7.20	10.26	14.11
ASEAN b/	0.66	0.59	1.19	2.30
China	1.92	1.70	1.83	2.73

Source: United Nations international trade data tapes.

a/ Net of imports.
b/ Including Singapore.

By 1980 there was evidence that ASEAN was beginning to benefit in a similar way at the expense of the East Asian NICs. As rising real wages were eroding the comparative advantage of Hong Kong, the Republic of Korea, Singapore and Taiwan Province in labour-intensive products, those NICs found it necessary in turn to move into more capital- and skill-intensive manufacturing or service industries, to the benefit of other developing countries, including ASEAN, or to relocate some of their labour-intensive industries there (Hughes and Parry [28]). Table 12 shows that, as the share of labour-intensive manufactures in the exports of the East Asian NICs declined between 1970 and 1981, it rose in the exports of the ASEAN countries. (The extent of the shift is partly masked by the ambiguity of the category "electrical machinery" which, in the ASEAN countries, represented almost wholly electronics assembly, while in the NICs it consisted increasingly of more sophisticated products.)

Table 12. East Asian developing market economies: exports by principal commodity groups, 1970 and 1981 (Percentage of total exports)

Commodity group	NICs		ASEAN	
	1970	1981	1970	1981
Textiles	9.6	8.1	0.5	1.3
Clothing	18.3	14.6	0.1	2.0
Electrical machinery	8.1	14.0	0.1	3.8
Miscellaneous	14.5	9.5	0.3	0.8
Other	18.9	29.6	3.9	4.9
Total manufactures	69.4	75.8	4.9	12.8

Source: Commodity Trade Statistics, Statistical Papers, Series D, various issues.

How far this process, and its benefits, will extend into the 1980s is another question. As more and more developing countries, including China as well as most of those of South Asia, let alone newly industrializing countries in other continents, turn away from import-substitution towards more export-oriented industrial policies, the field will become more crowded. This, too, is a question that will need to be taken up again in a later section.

There are few developing countries to whose good economic performance external support, whether through aid, direct private investment or credit, made a decisive contribution. Most aid has political or humanitarian motives and tends to go to countries which, for one reason or another are least successful economically. Similarly, private capital flow tends to be attracted by good economic performance, prospective profitability in the case of

direct foreign investment and credit-worthiness in the case of loan capital. Good or bad economic performance by developing countries depends primarily on national policy.

The rapid post-war recovery of the Republic of Korea and Taiwan Province during the 1950s and accelerating growth during the early 1960s has sometimes been attributed to the large volume of United States aid they received in the early post-war years. It is true that in the early 1950s United States aid financed up to 40 per cent of imports of goods and services of Taiwan Province and that aid to the Republic of Korea before, during and after the Korean war was very large, peaking at about $250 million in 1963. The Philippines and Thailand benefited from spillover of United States expenditures during the Viet Nam war, Hong Kong and Singapore were subsidized in the early years by the United Kingdom, and Indonesia received aid both before and after the change of régime in 1965-1966. But most of the massive aid received by the Republic of Korea and Taiwan Province was designed and used to support very heavy defence expenditure, and in the case of all the other countries aid, even when it was effectively used, was marginal. This is not to say that it was unimportant. In some countries in some years it valuably contributed to political stability, balance of payments and budget support, physical infrastructure and economic policy advice. But many other developing countries have received as much or more aid, in the form of both capital and advice, without being able to make good use of it.

The only one of the eight East Asian developing market economies that has relied heavily on direct foreign investment has been Singapore (Hughes and Parry [28]). Substantial flows of direct foreign investment have in some years gone to Malaysia, Indonesia and Thailand. But in the Philippines, the Republic of Korea and Taiwan Province the contribution of direct foreign investment to the financing of domestic investment has been small. The Republic of Korea, by a deliberate policy, and the Philippines, increasingly to relieve economic difficulties, have relied on foreign loans. Hong Kong and Taiwan Province, from 1960 onwards, kept total capital inflow to a minimum and in recent years have become substantial capital exporters. Malaysia has generally been a net capital exporter. As table 13 shows, in only three of the eight economies, Indonesia, the Republic of Korea and Singapore, did total capital inflow contribute more than one-quarter to the financing of domestic investment.

Direct foreign investment - predominantly by the United States in Hong Kong, the Philippines and Singapore; predominantly by Japan in Indonesia, the Republic of Korea and Thailand - undoubtedly made an important contribution to the development of export-oriented manufacturing industries, chiefly through the supply of technical know-how, management and access to markets. Through subsidiaries or joint ventures, transnational corporations are estimated to have been directly responsible in the mid-1970s for between 10 and 20 per cent of the exports of manufactures of Hong Kong, the Republic of Korea and Taiwan Province, and for as much as 70 per cent in the case of Singapore (Hughes and Parry [28], citing Nayyar, p. 16). But these economies received as much direct foreign investment - and

Table 13. East Asian developing market economies and other economic groupings: rates of domestic and foreign savings, 1950-1984
(Percentages)

Economy or economic grouping	Gross national savings rate						Rate of net foreign savings inflow					
	1950-1960	1960-1970	1970-1981	1982	1983	1984	1950-1960	1960-1970	1970-1981	1982	1983	1984
Hong Kong	9.2	20.6	28.33	28.2	25.1	29.0	-0.1	0.0	-1.6	3.5	1.9	-4.7
Indonesia	..	4.9	20.1	18.7	19.9	..	..	6.2	0.1	3.9	4.2	..
Malaysia	23.2	20.6	25.6	27.0	29.2	30.9	-11.0	-2.4	0.5	8.3	4.8	0.2
Philippines	14.3	18.2	23.8	21.6	20.6	17.4	1.0	1.9	4.9	6.8	6.6	0.5
Republic of Korea	3.3	13.7	22.6	24.1	26.4	..	8.2	9.5	6.8	2.3	0.8	..
Singapore	..	14.9	29.1	40.0	41.9	..	12.2	8.4	11.6	5.1	3.2	..
Taiwan Province	9.8a/	19.8	32.3	30.4	31.6	33.8	6.5b/	2.1	-1.7	-5.8	-8.8	-12.5
Thailand	15.3	19.9	20.6	20.9	17.9	20.9	0.2	2.6	5.5	0.1	5.1	2.2
Low-income developing countries	..	13.9	14.9	..	..	..	..	2.3	3.7	..	..	..
Middle-income developing countries	..	17.3	20.1	..	21.0	..	..	0.9	2.0	..	1.0	.
Developed countries	20.9	21.6	22.2	..	20.0	..	-0.5	-0.5	-0.4	..	0.0	..

Sources: [1], [3]; [4], May 1985.

Note: A negative sign indicates a net outflow of domestic savings.

a/ 1955-1960.

b/ 1952-1960.

particularly in the case of the Republic of Korea technology transfer through licensing agreements - as they wished to attract. In this sense, direct foreign investment was a policy, rather than an exogenous variable in their industrial development.

This last point suggests a further comment under the general heading of the external environment. It has been fashionable in recent years to blame the ills of developing countries on the machinations of transnational corporations, declining terms of trade, the debt crisis and other features of the existing international economic order. Whatever the pros and cons of direct foreign investment, it is not plausible to give credit to transnational corporations for the good economic performance of the East Asian NICs and to blame them for poor economic performance in the rest of the third world. More specifically, the self-interested involvement of transnationals in exports of manufactures, most directly through sourcing of components, has helped the East Asian NICs not only by providing market links, but also - in countering protectionist pressures in the OECD countries - they have provided countervailing power (Hughes and Parry [28]).

With regard to the terms of trade, the oil-importing countries of East Asia undoubtedly suffered a severe loss of real income when oil prices quadrupled and doubled again, but the shock led them to redouble their efforts to expand exports of manufactures; conversely, Indonesia as an oil exporter, though benefiting from a huge improvement in her terms of trade, was thereby, as was pointed out above, on balance held back in her industrial development. Most of the eight East Asian developing market economies managed to avoid a large foreign debt. Of the two with high debt-GDP ratios, the Republic of Korea has not been seriously troubled because of its good export performance, while the Philippines has been in serious difficulties because of domestically generated problems. On the whole, the eight found the international economic order of the 1960s and 1970s a favourable environment for rapid economic growth and they made the most of it.

E. Government policies: the macro-economic framework

It has been necessary to devote the preceding two sections to the preconditions of successful industrialization in the East Asian developing market economies in order to deal with the argument that it was these unusual preconditions that made possible the adoption of good policies, in other words that these economies managed good policies only because, as someone has put it, they have the kind of people they have and because they were lucky in their timing. It is, of course, an argument that can never be finally resolved. In many countries of the third world, the adoption of such market-oriented, outward-looking policies would have been more difficult because of historically conditioned political obstacles. And cultural factors - attitudes, institutions, patterns of behaviour - would have rendered such policies less effective, as indeed proved to be the case in varying degree in the resource-rich ASEAN countries. But favourable conditions and good policies interact. Attitudes and patterns of behaviour respond to economic opportunities. Political obstacles which seem irremovable in conditions of

economic stagnation may dissolve in conditions of rapid economic growth. Vested interests which obstruct the adoption of good policies are themselves often created by bad ones. The high level of education, the relative competence and integrity of the bureaucracy, the widespread consensus on priority for economic growth and the role in the economy accorded to private enterprises in the eight East Asian economies - all these were as much the results as preconditions of government policies.

Moreover, to underline an important point made earlier, whatever the relative weight attached to preconditions and policies in the success achieved, there is one very practical reason for focusing primarily on the policies that were adopted: it is the policies that may have lessons for other developing countries. Preconditions are given, policies are at least in principle open to choice. Even if the preconditions are unfavourable, it is useful to know which are the better and which the worse policies, which the more and which the less likely to achieve the desired objectives.

The policies which attract most attention in explaining success or failure in industrial development are naturally those designed to assist or promote manufacturing industry in general or in particular. But it has often been pointed out that successful industrial development depends hardly less on the macro-economic framework set by the broader range of government policies, and that it is to the generally high quality of overall economic management in the East Asian NICs and, at least in some respects also in the other four ASEAN countries, that their good industrial development performance must in part be attributed. These macro-economic policies - defined as policies which do not discriminate between sectors, industries or firms - will therefore be examined first.

The most general, and in some respects the most important, feature of the macro-economic environment for industrial development in the eight market-oriented developing economies of East Asia is also one of the most difficult to define precisely. It relates to the term "market-oriented". Government policy in all these economies, including Indonesia after 1965, explicitly rejected public ownership of the means of production and centralized planning and control of the economy. But none of them, with the exception of Hong Kong, adopted a policy of laissez-faire. In all the others, governments played a pervasive role in the economy. In several of them, especially Indonesia, a considerable part of the modern sector, not least in manufacturing, consisted of public enterprises, and the private sector was subject to extensive government regulation. Nonetheless, all of them could be said to be market-oriented in that business activity was in the main left to private enterprise, that the allocation of productive resources was largely left to market forces, that governments generally speaking encouraged private business to be competitive and that, to a greater degree than in most developing countries, government policy aimed at integrating the national economy into the world market economy. In the "index of price distortions" through government intervention of one kind or another compiled by the World Bank in 1983, all five of the eight economies for which data

were available, including Indonesia, were found to be less distorted than the average of the sample of developing countries (and the same would have applied *à fortiori* to the other three, Hong Kong, Singapore and Taiwan Province) (World Bank [2], 1983, p. 60).

Even the *laissez-faire* policy of Hong Kong accorded government an important role with respect to what Adam Smith called the three "duties of the sovereign" - defence, law and order, and public goods. The Hong Kong government once explained that, in its view, "the government's principal role is to ensure the provision of an adequate infrastructure to enable industry to function efficiently and profitably with minimum interference" (Riedel [18], p. 31). High or at least adequate minimum quality of performance of the duties of the sovereign has certainly been an important contribution of policy to industrial development in all eight economies. Law and order have been well maintained in the East Asian NICs, as there has, generally speaking, been efficient and honest administration. In the other four ASEAN economies, the standard of the former has been high except earlier in Indonesia and latterly in the Philippines. If the same cannot be said without reservations about the standard of administration, at least two of them, Malaysia and Thailand have been well above the third world average also in this respect. In none of the eight - and this can be said even of Indonesia since the early 1970s - have transport, utilities and communications been the bottlenecks they have been in India, for example, or in many African countries.

Reference has already been made to the outstanding contribution to industrial development, certainly in the East Asian NICs, as earlier in Japan, through the provision and encouragement of education. An important part, it has been suggested, of the reason why by 1983 Japan had achieved 12 times the per capita income of Thailand, although both countries embarked on modernization in the same year, 1868, was that in that year already three-fifths of Japanese had a good primary education while the people of Thailand were still largely illiterate (Hirono [19]). As was shown above (table 8), all four East Asian NICs have achieved secondary school enrolement ratios comparable to those of developed countries and even the Philippines and Malaysia are in this respect above the average of middle-income developing countries. "Abundant high-quality manpower with basic academic training in science and technology", it has been said, "is Taiwan Province's most important resource" (Liang [29], p. 25). The Republic of Korea has made up for a lower rate of public expenditure on education by such high priority for children's education in the private consumption expenditure of their parents that total expenditure on education has been running at the extraordinarily high figure of 9 per cent of GNP (Scitovsky [13], p. 219). The Republic of Korea also has been ahead of most developing countries, including the other East Asian NICs, in government research and development expenditure and encouragement of technological innovation by private industry (UNIDO [30], vol. III; Roepstorff [31]).

Another important feature that has distinguished general economic policy in these eight economies from many other developing countries is generally prudent macro-economic management. As table 14 shows, five of the eight have a remarkable record of keeping inflation under control, better than that of developed countries. Even the three countries that suffered serious bouts of inflation, Indonesia, the Philippines and the Republic of Korea, countered them sufficiently to keep their average inflation rate well below that of middle-income developing countries. It seems likely that domestic financial stability and export orientation were causally interrelated. Openness of the economy required cautious domestic financial management since changes in the nominal exchange rate could not significantly influence the real exchange rate, and a low inflation rate in turn helped maintain international competitiveness.

Table 14. Inflation rates of East Asian developing market economies and other selected economies and economic groupings, 1965-1983
(Annual average percentages)

Economy or economic grouping	Inflation rates 1965-1973	1973-1983
Hong Kong	6.4	9.9
Indonesia	63.0	18.0
Malaysia	1.2	6.5
Philippines	8.8	11.7
Republic of Korea	15.5	19.0
Singapore	3.1	4.5
Taiwan Province	4.3	7.9
Thailand	2.5	8.7
Japan	6.3	7.7
United States	4.7	7.5
Middle-income developing countries	5.2	29.3
Developed market economies	5.2	8.0

Source: [2].

Prudent demand management has, generally, gone hand in hand with promotion of financial development. Taiwan Province, as early as the 1950s, pioneered the policy of deregulating interest rates to encourage saving and efficient allocation of capital. The Republic of Korea followed suit in the mid-1960s. The other six have all subsequently opted for financial liberalization, including in the early 1980s even Indonesia, and the Republic of Korea for the second time. All succeeded sooner or later in ridding themselves of overvalued currencies. Hong Kong and Singapore have

built up major international financial centres, and Malaysia and Taiwan Province have become net capital exporters. Some of them, especially the Republic of Korea and until recently Indonesia, have relied heavily on bank lending as an instrument of government control, or at least guidance, of investment (Scitovsky [13]; Wade [32]); and there is as yet little development of an active securities market in any of them. But low inflation, financial development and rapid growth have combined to yield remarkably high rates of domestic resource mobilization and investment in all of them (table 13 above).

High rates of growth, not least of manufacturing production, in the East Asian NICs during the 1960s quickly absorbed open unemployment and, in the Republic of Korea and Taiwan Province, labour released by agriculture. With full employment and rapid growth in labour productivity came a sustained rise in real wages which helped maintain a flexible labour market and industrial peace. In the other four ASEAN countries, labour market experience remained more mixed. As table 15 shows, real wages rose rapidly also in Malaysia and recovered in Indonesia during the 1970s, but probably fell in the Philippines and rose little in Thailand, which still had large reserves of rural labour. Manufacturing employment rose substantially in Malaysia and Thailand but, with increasing emphasis on capital-intensive industry, only sluggishly in the other two countries.

Table 15. East Asian developing market economies: indicators of labour market conditions, 1955-1983
(Percentages)

Economy	Growth of real wages		Open unemployment		Growth of manufacturing employment	
	Period	Rate	Period	Rate	Period	Rate
Hong Kong	1960-1970	4.7	1960-1970	4.2	1961-1971	4.7
	1970-1980	4.2	1970-1980	4.5	1971-1984	4.3
Indonesia a/	1955-1967	-3.4	1961-1971	5.5	1961-1971	3.3
	1971-1980	5.1	1976-1982	2.5	1976-1982	1.2
Malaysia	1962-1973	--	1967-1972	7.2	..	
	1973-1981	5.0	1973-1983	5.7	1973-1983	8.1
Philippines	1965-1973	-1.6	1960-1973	6.5	1960-1973	2.6
	1973-1981	--	1973-1983	4.4	1973-1983	4.0
Republic of Korea	1963-1973	5.4	1965-1973	5.3	1963-1973	11.2
	1973-1983	9.5	1973-1983	4.2	1973-1983	6.3
Singapore	1965-1973	0.6	1967-1973	6.0	..	
	1973-1983	5.4	1973-1983	3.7	1973-1983	5.5

continued

Table 15 (continued)

Economy	Growth of real wages Period	Rate	Open unemployment Period	Rate	Growth of manufacturing employment Period	Rate
Taiwan Province	1960-1973	7.7	1960-1973	1.6	1960-1973	8.1
	1973-1983	6.5	1973-1983	1.0	1973-1983	4.8
Thailand	1961-1973	..	..		..	
	1975-1979	2.0	1973-1982	0.8	1973-1983	10.0

Sources: [3]; [4], 1977 and 1985; [33], [34], [35], [36], [37]; Major Statistics of the Korean Economy, 1985 (Seoul, National Bureau of Statistics, 1985).

a/ The Indonesian data are particularly suspect due to changes in definition of the organized manufacturing sector over time and other anomalies.

A feature of overall economic policy in all these economies, more elusive but probably very important to their success, has been flexibility. This has partly been implicit in their market orientation but has also been conspicuous where government has been entirely in control. Some of these countries have drawn up four- or five-year development plans but, like Japan, they have not allowed the pattern and rate of economic growth to be constrained by them. Government policy-makers have generally been willing to learn from past mistakes and to reverse course. In some cases, the response was quick, as in the shift from import substitution to export-oriented industrial policy in the Republic of Korea, Singapore and Taiwan Province in the 1960s, Singapore's decision to scrap the motor vehicle assembly industry in 1980, or the abolition of exchange control by Indonesia in 1970 and by Singapore in 1978. In other cases, it came more slowly, as in the corresponding move into manufacturing for export in the other four ASEAN countries in the 1970s or financial liberalization in Indonesia and the Republic of Korea in the early 1980s. Another example, of special importance to industrial development, has been the early adoption of structural adjustment policies with the decline in comparative advantage in labour-intensive manufactures. But this belongs less to macro-economic than to specifically industrial policy which is the subject of the following sections.

F. Government policies: from import substitution to export orientation

Countries embarking on industrialization normally begin by producing at home manufactures hitherto imported. In most cases, domestic manufacturers are initially granted tariff or other protection from imports. Import substitution has the advantage that a

ready-made market exists, and it is relatively easy to protect infant industries. In the early post-war years and during the 1950s, import substitution received further strong impetus, beyond that resulting from wartime interruption of trade, from import restrictions imposed in many developing countries for balance-of-payments reasons, from pessimism about their world markets for primary products and their capacity to compete with developed countries in exports of manufactures, and in some countries from a belief that the central planning model had demonstrated the merits of autarkic industrial development (Arndt [38]; Little [39]).

Import substitution under cover of protection has also characterized the first phase of industrial development throughout Asia, except in Japan where the "unequal treaties" initially imposed free trade although Japanese industrial development has nonetheless for a century been largely directed towards the home market, and in Hong Kong which, with its entrepôt past and aided by a post-war influx of Shanghai industrialists, was able from the 1950s to stand on its own feet in domestic and export markets.

In the other seven of the East Asian developing market economies, protection through tariffs and quantitative import and exchange controls was given to domestic manufacturing industries for varying periods from the early 1950s in the Philippines (as part of a deliberate import-substitution strategy), the Republic of Korea and Taiwan Province. Singapore imposed tariffs and quotas after independence in 1959, largely with an eye to the market of a Malayan federation of which it was then a member, as did Malaysia and Thailand when they embarked on industrialization in the early 1960s. Indonesia's industrial development, limited and precarious until the mid-1960s, has until recently been almost wholly for the domestic market and heavily protected.

Singapore and Taiwan Province were the first to move away from sole reliance on import substitution. In the case of Singapore, the rationale for import substitution disappeared with the breakdown of federation with Malaysia in 1965. Its policy-makers promptly drew the consequence by reverting to free trade and encouraging manufacturing for export through tax concessions to exporters and foreign investors. In Taiwan Province the shift towards a more outward-oriented strategy came even earlier, in the late 1950s, when the exchange rate was unified, the currency revalued and incentives to exports introduced or strengthened. This was followed from the mid-1960s by substantial import liberalization, with abolition of quantitative restrictions and reduction of tariffs to low levels for most imports.

The Republic of Korea also engaged in deliberate promotion of exports from the early 1960s. Both in the Republic of Korea and Taiwan Province, export promotion consisted chiefly in dismantling or offsetting previously instituted macro-economic policies that discriminated against exports and partly in measures actively discriminating in favour of exports. The ending of multiple exchange rates and overvaluation of the currency were the most important among the former set of measures, but they also included

export-processing zones and bonded factories which helped exporters chiefly by eliminating red-tape in securing remission of such duties. Active discrimination in favour of exports mainly took the form of cheap bank loans and of tax concessions, such as exemption from indirect taxes for exports and inputs into exports and of part of export earnings from income tax. In the Republic of Korea, export production was also aided by export insurance and discounts on railway freights and electricity rates (Scitovsky [13], pp. 234 f.). The value to exporters of these concessions is estimated to have been around 10 per cent of gross export receipts in both economies in the late 1960s (Balassa, cited in Scitovsky [13], p. 235). The results achieved by these policies in both economies were spectacular. Over the period 1965-1981, exports of the Republic of Korea (in United States dollars) rose at an average annual rate of 35 per cent, those of Taiwan Province at 27 per cent. The high rate of growth propelled by exports also caused imports to rise (by 27 per cent annually in the Republic of Korea and 26 per cent in Taiwan Province) but less rapidly than exports, so that the balance of payments improved (Scitovsky [13], p. 235).

Malaysia and Thailand, encountering the limits to import substitution in a small domestic market and encouraged by the success of the East Asian NICs, began in the early 1970s to follow their example by encouragement of labour-intensive export industries - chiefly textiles, clothing and electronics assembly, but also timber and rubber processing and, in the case of Thailand, precious stones and jewellery. By 1982, textiles, clothing and electronics assembly were estimated to generate two thirds of Malaysian exports of manufactures and two fifths of full-time employment in Malaysian manufacturing industries. Both countries, however, were somewhat unfortunate in the timing of export orientation, benefiting disproprotionately from boom conditions in their OECD markets in the early years and running into recession at the end of the decade. This, and the discovery of substantial resources of oil (Malaysia) and natural gas (Thailand), induced both countries to shift the emphasis of industrial policy in the early 1980s towards heavy industry.

In the Philippines and Indonesia the desirability of more export-oriented industrial development came to be recognized somewhat later, underlined in the former case by a rising oil import bill in the early and late 1970s, and in the latter by declining oil prices in the mid-1970s and early 1980s. There was some liberalization of tariffs, and in both countries exports of a limited range of labour-intensive manufactures (chiefly electronics assembly in the Philippines and garments and plywood in Indonesia) expanded rapidly from a small base. But in both countries, inefficiencies and vested interests fostered by a long period of protected import substitution limited the scope of export-oriented manufacturing as well as its impact on the domestic economy (UNIDO [24], [25], [26] and [30]; Ariff and Hill [40]).

The reasons for the progressive shift from import substitution to export orientation in the East Asian developing market economies

during the 1960s and 1970s are not hard to find. They were basically increasing concrete evidence of the disadvantages of the former and the success of the latter strategy of industrial development.

The most obvious limitations of an import-substitution strategy are those imposed by the size of the domestic market, which depends not only on the size of the country's population but also, as large countries have sometimes been reluctant to recognize, on average per capita income. In all but very small or poor countries there is always some scope for import substitution, but even in large countries it is, in its nature, limited. The first phase of import substitution ends when imports of the standard manufactured consumer goods, such as textiles, clothing, footwear and simple household goods, have been largely replaced and further expansion depends on growth of domestic demand alone. If, as is almost invariably the case, domestic manufacturers require tariff or other protection from import competition, there is a loss of allocative efficiency reflected in a loss of real income inflicted on domestic consumers in the form of higher prices or lower quality of home-produced goods. The loss of allocative efficiency arises from the allocation of resources to manufacturing industries in which, at least initially, the country has a comparative disadvantage. The protection afforded to these industries can be shown to discriminate against actual or potential export industries in which the country has a comparative advantage, partly by raising the cost to these export industries of local factors of production and of imported inputs, and partly by reducing imports and thus, through the effect on the exchange rate, the prices exporters obtain (in home currency) for their products (Corden [41], p. 67).

Protection for import-competing domestic manufacturing industries is usually justified by the "infant industry" argument - that the protected industries will gradually, through "learning by doing" and increasing attainment of economies of scale, become internationally competititve. The trouble is that, in almost universal experience, the protected infants fail to grow up (it is a moot point whether the infants grew up so well in Japan because they were, or were not, protected). The inefficiencies created by protection against imports are liable to become cumulative. If tariffs give insufficiently secure protection, often because they are eroded by smuggling, they are commonly reinforced by import licensing of ever-increasing product coverage and ever finer selectivity. If, as is often the case, import substitution is at first embarked upon to relieve balance-of-payments difficulties, the consequences of overvaluation of the currency in the form of a proliferating network of exchange controls add to the stifling effects of bureaucratic regulation, which in turn generates black markets requiring more controls. If industries producing consumer goods are also assisted by low or zero duties on imported capital equipment, in a "cascading" tariff structure, there is a bias in favour of capital-intensive methods of production which is reinforced if industries are also helped by cheap credit or other investment subsidies.

Most important of all, there is the working of the political market of "rent-seeking" vested interests. Protected manufacturers find it easier to lobby for more protection than improve the efficiency of their firms. Non-protected and disadvantaged industries complain about unfair treatment and demand compensatory assistance. Labour in protected industries shares in the rents through higher wages, at the expense of employment opportunities for other sections of the work-force. Price distortions maintained by the regulatory framework reduce flexibility, the capacity of the economy to adjust. In sum, the adverse effects of the dynamic losses imposed by an import-substitution régime on the efficiency of the whole economy may greatly exceed those due to the more obvious loss of static allocative efficiency.

These problems of the import-substitution approach to industrial development first became apparent in Latin America, India and the Philippines. From the late 1960s they became the subject of an extensive literature (Little, Scitovsky and Scott [42]; Asian Development Bank [43]; Balassa and Associates [44]; Krueger [45], [46]), which undoubtedly contributed to the change in the climate of opinion in favour of a more export-oriented strategy. It is important to understand that this strategy did not imply a move to the opposite extreme, distorting the allocation of resources in favour of exports, though this has happened in some degree in some cases. The primary objective was to "unshackle exports" (Riedel [18], p. 35), to eliminate, or at least reduce, the discrimination against exports introduced by import-substitution policies, in other words to move towards a more neutral policy stance, not markedly biased in favour of either import substitution or export promotion. In this sense, it was a more market-oriented policy, though in most of the East Asian economies government policy remained strongly interventionist.

The advantages of export orientation in this sense were found to be very largely the converse of the disadvantages of import substitution that had come to be experienced. There was, first and most obvious, the improvement in resource allocation implicit in a pattern of trade and structure of production more in accord with comparative advantage. All the East Asian economies had initially an abundance of relatively unskilled labour. Export orientation enabled them to follow the course pioneered by Japan in the interwar years - to maximize the advantage of this cheap labour by competing in overseas markets for labour-intensive products, chiefly the traditional triad of textiles, clothing and footwear, but also miscellaneous manufactures from Hong Kong's dolls and wigs and Taiwan Province's tinned mushrooms, to Thai jewellery, Philippine furniture, and later electronics assembly and components, the latter largely through offshore sourcing by United States companies and relocation by Japanese companies. Low labour costs gave these industries a competitive advantage in overseas markets and their labour-intensity reinforced the beneficial effects of their rapid growth on employment.

While the resource-poor East Asian NICs had to rely almost wholly on their comparative advantage in cheap unskilled labour and later increasingly in skilled labour, export-oriented industrial

development in the resource-rich other four ASEAN countries could also draw on comparative advantage in resource-based manufacturing industries, such as mineral or cash crop or timber-processing industries - "export substitution" in Hla Myint's phrase (quoted in Asian Development Bank [43]).

In the oil and metals sectors, such processing industries tended to be very capital-intensive. They therefore contributed relatively little to employment. But provided they had a genuine comparative advantage (at international prices), their development represented a more efficient use of resources for growth, even in purely static terms, than highly protected production for the home market.

Again, however, the most important advantages of export orientation were almost certainly the dynamic gains from trade. These gains, it is important to note, were not confined to the direct contribution made to GDP growth by rapidly growing export industries; they extended throughout the non-export sectors. Export orientation, as Balassa has put it, raised "total factor productivity through its favourable effects on the efficiency of resource allocation, capacity utilization, economies of scale, and technological change" (Balassa [10], p. 1), to which one might add the broader effects on the competitiveness and flexibility of the economy, as well as on income distribution. None of these effects is easy to demonstrate conclusively, let alone quantify (Balassa [10]; Krueger [46], p. 147). But there is a wide consensus in the literature that they largely account for the outstanding development performance of the East Asian economies that was documented in section B.

Export orientation can reap economies of scale not available in production for a small domestic market. How important this is depends on the technical conditions of production and market structure in different industries, as well as on the size (and per capita income) of the country. For processes and activities that are highly divisible and have constant returns to scale, the size of production run does not matter (Krueger [46], p. 145), which partly explains why in Taiwan Province and Hong Kong, in particular, manufacturing industries consisting of hundreds of very small firms were able to do so well. Even in these industries, however, there may have been industry-wide pecuniary economies of scale, related to infrastructure, marketing etc., which would not have been obtainable without the addition of exports to sales in the home market. Industries with processes for which there is a minimum efficient size of plant or production run, such as motor vehicles, tyres, metal smelting and fabrication, shipbuilding and many others, cannot operate efficiently in a small economy without export markets, and for many such modern industries the home market even of very large but poor developing countries, such as India or Indonesia, is too small.

Economies of scale may or may not be significant, but there is little doubt about the powerful stimulus to efficiency and growth which export orientation gives by freeing business enterprise from

some of the shackles of bureaucratic regulation and by exposing the domestic economy to international competitiveness. Naya has well summarized these benefits: "Flexibility in resource deployment; competitive abilities that arise from production for contestable markets abroad; learning of technological and managerial skills; fostering of good work habits and attitudes rather than 'rent-seeking' behaviour; all tend to be more associated with export-oriented, outward-looking development strategies. In turn, these dynamic gains are reinforced by domestic economic policies that allow both market forces to work and improve the infrastructural and institutional framework of the economy" (Naya [47], p. 28; see also Donges and Hiemenz [48] and Krueger [46]).

Not all these benefits will accrue inevitably and in all circumstances. Feeble domestic manufacturers may be put out of business rather than being stimulated by international competition. Markets may work imperfectly. Regulation may be needed for non-economic objectives. But the evidence is overwhelming that in the East Asian economies the shift from import substitution to export orientation released energies which translated into astonishingly rapid and dynamic growth. Merely to be relieved of the incubus of overvalued currencies, of restrictions on imports of necessary materials and equipment, and of the need for innumerable official signatures for almost every business transaction, gave a lift to anyone with a spark of enterprise. Lobbying for government protection or subsidies did not wholly disappear, but it ceased to be the easiest road to profitability or survival. Risk-takers now had the advantage over those preferring the monopoly rents of the quiet life. Exporting reduced information costs by establishing contact with foreign suppliers and buyers, business trends and practices, new ideas and technologies. Price signals in the market provided a feedback, facilitating the correction of mistakes and adjustment to changing market conditions. Market orientation in trade policy was in most countries accompanied by liberalization of financial and foreign exchange markets. More realistic interest rates encouraged higher rates and more efficient use of domestic saving (Scitovsky [13]; Riedel [18]; Hughes [49], [50]); more realistic exchange rates helped release investment and growth from chronic balance-of-payments constraints.

Export-oriented industrial development, finally, is widely believed to have been an important contributory factor in the combination of high rates of growth with relatively low and diminishing income inequality in the East Asian NICs (Riedel [18], p. 21; Naya [47], p. 18). Sustained high demand for labour consequent upon rapid growth of labour-intensive industries proved an effective - perhaps the most effective - way of alleviating poverty. Real wages rose extremely rapidly in all four economies, and in some - certainly in Taiwan Province and during the 1960s in the Republic of Korea, and probably also in Singapore and Hong Kong although no reliable data for these two economies are available - the share of labour in national income increased (Scitovsky [13], p. 241). Export-oriented industrial development does not guarantee overall improvement in a country's income distribution. This depends on many other factors which have probably been favourable

in the East Asian NICs, but much less so in the other four ASEAN countries or in some of the more highly industrialized Latin American countries, such as Brazil or Mexico. But there can be little doubt that it is, in itself, a potent favourable factor.

In none of the eight East Asian economies any more than in Japan did the shift to export orientation mean the end of import substitution, not even in Hong Kong or Singapore where import substitution did not enjoy tariff or other protection. In most of them, manufacturers producing for the domestic market, particularly in the intermediate and engineering goods industries, continued to enjoy some degree of tariff protection, though generally at much reduced effective rates, exporters being compensated more or less fully for the higher costs by tax and other concessions. In addition, invisible barriers of one kind or the other limited access to their domestic markets for imports of manufactures from other countries.

Table 16 shows that, except in Singapore (and a fortiori Hong Kong, for which such data are not available), effective rates of protection remained quite high even after liberalization reforms, at least in sensitive categories, such as transport equipment and consumer durables. The most widely discussed case of a huge potential market largely closed to foreign manufacturers despite low formal trade barriers is Japan. Explanations of the puzzle range from the high quality of Japanese products, at least in Japanese eyes, to business practices and marketing arrangements which severely handicap, if not altogether exclude, foreign suppliers (Saxenhouse [51], Kraus and Luetkenhorst [52]). Much the same is said to apply, if not quite in the same degree, to the Republic of Korea. Even of Taiwan Province it is said that formal liberalization has been qualified by "the reluctance of the lower ranks of the bureaucracy to give up their restrictive powers" (Liang [29], p. 20). These failures to liberalize imports more effectively have been, and remain, of concern to foreign Governments and exporters seeking access to these markets, but since export industries have been generally exempted or compensated they do not detract from the export orientation that has characterized the trade régime of these countries. This régime has not been one of free trade but of "free trade for exporters".

Export orientation is not without its costs. Apart from general opposition to a market economy (which is not prominent in the East Asian market economies, except to some extent in Indonesia), three main objections are commonly advanced. One is that, by integrating national economies into the world market economy, it renders them more vulnerable to external fluctuations and shocks. The second is that, once substantial import-substitution industries have been built up under cover of protection, removal - especially sudden removal - of this protection inflicts undue hardships on some sections of the community. The third is that, at best, export orientation is feasible only at a fairly advanced stage of economic development, after an initial industrial infancy phase, to be reckoned in decades, of import substitution. The first two of these objectives will be considered in some detail in the next two sections. But a word should be added about the third.

Table 16. Rates of nominal and effective protection, 1965-1980
(Percentages)

East Asian economy and reference year	All manufactures		Consumer durables		Machinery		Transport equipment	
	Nominal	Effective	Nominal	Effective	Nominal	Effective	Nominal	Effective
Indonesia								
1975	20	30	..	224	..	15	..	715
Malaysia								
1978	22	39	55	173	22	39	0	-5
Philippines								
1965	51	51	70	86	16	34	..	75
1980	..	70	..	115	..	24	..	..
Republic of Korea								
1968	11	1	31	51	28	43	54	164
1978	18	31	40	131	18	47	31	135
Singapore								
1967	3	6	/	10	5	6	1	-1
Taiwan Province								
1969	12	15	14	29	9	1	27	55
Thailand								
1978	27	70	57	496	21	58	80	417

Sources: [33], [53] and [54].

In principle it should be no more difficult to "learn by doing" in an export industry than in an import-competing one. In practice, however, it is much easier for Governments to protect infants in the home market than to subsidize their exports (if only because export subsidies are more liable to provoke retaliation). Almost anything can be sold in a fully protected home market. No manufactures can be sold abroad without skilful marketing that requires knowledge and experience not generally at the disposal of manufacturers in developing countries. In the East Asian economies, this marketing function has been performed partly by buyers from the developed importing countries (or transnational corporations in the case of offshore sourcing) or, most vigorously and successfully in the Republic of Korea, by specialized trading companies, modelled on the Japanese sogo shoshas (Scitovsky [13], p. 237).

Towards the end of the 1970s there was a shift in industrial policy in all the East Asian developing market economies from labour-intensive towards more capital- and skill-intensive industries, and in some of them, in consequence, towards a "second round of import substitution". Scitovsky has summed up the considerations behind this shift in the case of the Republic of Korea:

> "The desire to exploit the comparative advantage of the Republic of Korea in skilled labor, to defeat United States import restrictions by increasing the domestic value-added content in textile exports, to diversify exports, partly by stepping into the void created by Japan's diminishing competitiveness in some sectors and by the advanced countries' own reduced output of certain products for fear of industrial pollution, and to cater to the Republic of Korea's own increased domestic demand, including the demand of its export industries, increased domestic demand for intermediate goods. Finally, defense considerations, prompted by the threatened withdrawal of American forces from the Republic of Korea, also played a part" (Scitovsky [13], p. 258).

In the case of the Republic of Korea, the shift was from light industries, such as food-processing, textiles, clothing and plywood, to steel, chemicals, shipbuilding, construction, motor vehicles and, within textiles, to sports clothing and other speciality and high-quality items. The gradual and quite successful shift during the early 1970s was suddenly drastically speeded up when 80 per cent of investment under the Fourth Five-Year Plan was crowded into three years (1977-1979), just as the world economy was moving into a severe and prolonged recession, with very adverse effects on domestic inflation, capacity utilization and the competitiveness of exports of the Republic of Korea (Scitovsky [13]).

In Hong Kong and Taiwan Province the change resulted mainly from business reactions to loss of competitiveness in labour-intensive industries with rising real wages, although in Taiwan Province there was also considerable investment in State-owned steel, shipbuilding and petrochemical industries. In Singapore, government direction was largely responsible for the decision to

develop one of the world's largest oil-refining centres and petrochemical industries, and also played an important part in encouraging private investment in such service industries as tourism (hotels) and finance (the Asian dollar market). Just as Singapore sought to take advantage of its key location in Asian oil trade, so the other ASEAN countries were all tempted into heavy industry programmes by their endowment with natural resources, oil, natural gas and minerals. The not altogether happy experience of all four with these programmes presents illuminating case-studies in problems of structural adjustment which are the subject of the following section.

G. Government policies: structural adjustment

The previous section traced the shift from an import-substitution strategy of industrial development to an export-oriented one based chiefly on labour-intensive manufactures - in the East Asian NICs during the 1960s and in the otner four ASEAN countries during the 1970s - and the moves towards more capital- and skill-intensive industries in the late 1970s as rising wage costs at home and narrowing market prospects overseas seemed to turn comparative advantage away from labour-intensive industries.

What role did government industrial policies play in this process of structural adjustment? Is it true, as is widely believed, not least in some of the ASEAN countries, that success was largely due to the influence of the Japan model - strong government guidance of the process, through anticipation of changes in comparative advantage, picking winners and phasing out losers? To examine this question is the purpose of the present section.

It is not a question that permits a straightforward answer, if only because, despite extensive discussion, the working of industrial policy in Japan is not yet well understood and because the role of Governments differed considerably among the East Asian NICs themselves.

Picking winners. Patrick has pointed out that there are two schools of thought about Japanese industrial policy:

> "One school sees Japan as embodying a State-guided capitalist developmental system in which MITI (Ministry for Trade and Industry) and industrial policy have played a central role. In this view, government leadership has been the key to Japan's economic success, with business a willing follower. An extreme version of this approach is encapsulated in the phrase Japan, Inc.... The other school sees the basic source of Japan's economic growth in a vigorous private sector which energetically, imaginatively and diligently engaged in business, productive investment and in commercially oriented research and development and in the saving to finance those activities. Business entrepreneurs were the engine of growth" (Patrick [55], pp. 15 f.).

MITI itself has leaned towards the first school. MITI liked to think that it could better anticipate the long-run strategic needs of the economy than could the market-place. It saw its task as accelerating the transfer of resources to the major industries of the future while smoothing the process of decline of uncompetitive industries. The industries of the future would be industries of significant size in which Japan would have a future comparative advantage as relative supplies and costs of factors of production changed with domestic growth and evolving international economic conditions, industries for which domestic and world demand could be expected to be highly income-elastic and in which Japan would become internationally price-competitive (Patrick [55], p. 6).

It was a market-oriented policy which emphasized economic growth, efficient allocation of resources and a domestically and internationally competitive economy. It rested on close co-operation between Government and business, but Government - represented primarily by MITI - was in the driver's seat. MITI picked the winners, and once it had selected a winner, it backed it with a comprehensive package of support: accelerated depreciation allowances, special research and development funding or tax benefits and loans through the Japan Development Bank or other financial institutions. MITI's objective was to use "market incentives to encourage business behaviour in desired directions" - that is, directions desired by MITI (Patrick [55], p. 9).

As far as outsiders can judge, this MITI image of its own role was an important part, but not the whole, of the truth. It probably requires qualification in at least three respects. First, it does not seem to have been simply MITI officials who picked the winners. There was continuous close consultation, and interchange of information, between MITI and business, at least big business, and the selection, it appears, was frequently based on business advice. Secondly, MITI's encouragement of competition was not unqualified. Certainly it aimed at making Japanese industry internationally competitive. It also promoted competition among Japanese firms, for example by encouraging the co-existence of several firms in each growth industry. But it also regarded it as one of its tasks to avoid "excessive competition" (Uekusa and Ide [56]), a task which must have muted competitive pressure on individual firms, and, as was noted earlier, domestic Japanese industry was not generally exposed to foreign competition until it was well able to hold its own.

Thirdly, MITI has a by no means unblemished record in "picking winners". It had some notable successes but also a good many important failures. Many of Japan's most successful industries of the 1960s - consumer electronics, motor cars, indeed virtually all consumer goods - succeeded on their own without special government support. MITI initially opposed the establishment of the steel industry (and, it is said, of Sony). It sought unsuccessfully to prevent the emergence of new motor car manufacturers and only thus failed to kill at birth one of Japan's success stories, Honda. In promoting dubiously competitive petroleum- and energy-intensive industries, such as aluminium, in the 1960s, MITI, like others,

failed to foresee the rise in energy prices that rendered these industries even less competitive. MITI encouraged a huge expansion of shipbuilding that was widely, and as it turned out, correctly, expected to run into world-wide excess capacity. Among industries which MITI at various times saw as potential winners but had to abandon in the face of foreign competition were the production of construction equipment, chain-saws, marine engines and plate heat-exchanges. The chemical industry that MITI pushed vigorously has remained fragmented and plagued by high costs (Kasper [57]; Patrick [55]; Brittan [58]).

The success of Japan's industrial policy during the past quarter of a century is indisputable, and it would be unreasonable to deny MITI's share in the success. The role of MITI in gathering and facilitating exchange of information about market and technology trends and in steering industrial policy through a consensus established by and with industry participants - "industry planning from the bottom up", as it has been called (Kasper [57], p. 4) - must have helped by reducing risk and information costs. More generally, industrial development unquestionably benefited from Japan's tradition of co-operative and mutually beneficial government-business relations - Patrick contrasts it with the United States' "adversarial, suspicious, more individualistic society and its institutions" (Patrick [55], p. 11). But whether MITI's record demonstrates the value of the Japan model in the sense of strong government guidance of the process of structural adjustment, and particularly of a government role in picking winners, is an open question.

> "Investment decisions must be based on predictions of future needs and availabilities; and politicians and civil servants need be no worse than businessmen at weighing all the information available for making the best predictions. People in government, however, are seldom affected quite so personally and profoundly by the outcome of their investment decisions as are businessmen... Moreover, central planners can too easily overrule businessmen's dissent, which puts official investment plans in danger of being too monolithic, too narrowly and confidently focussed on what seemed best in the planners' judgment." (Scitovsky [13], pp. 256 f.).

MITI planning by consensus must have reduced this danger, and there is no doubt of the high average level of professional quality of MITI staff. But the historical record of failures even in Japan serves as a warning against over-optimism.

The East Asian NICs followed the Japan model in varying degree, and here, too, the record of Governments in picking winners is mixed. The Hong Kong government adopted a policy of what its Chief Secretary once called "positive non-interventionism":

> "When faced with an interventionist proposal, the Hong Kong government does not simply respond that such a proposal must, by definition, be incorrect. It is true that, more often than not, we come to the conclusion that the balance of advantage

lies in not intervening. Yet, in all cases, decisions are made positively, and not by default, and only after the immediate benefits and costs, to the extent that they can be confidently predicted, are weighed against the medium- and longer-term implications of the interventionist acts proposed (including the inevitable difficulties of unwinding them)" (quoted in Riedel [18]).

The industrial policy of Taiwan Province has been only marginally more interventionist than Hong Kong's. During the 1960s the government certainly did all it could to encourage investment in export-oriented labour-intensive manufacturing industries by the various macro-economic policy measures that were described earlier (see section F), but it left investment decisions by and large to business. Its objective was to create "an essentially free-trade, free-market régime for exports and export production" (Scitovsky [13], p. 223). In the face of the problems presented to sustained expansion of labour-intensive manufactures by rising labour costs at home and slower growth and protectionism abroad, the government has responded by promoting a shift from unskilled-labour- and capital- and energy-intensive industries to skill and high-technology areas. It provided incentives in the form of cheap credit and tax holidays and took a major initiative in the form of a science-based park or industrial estate to encourage new "strategic" industries, especially machinery manufacturing and information and electronics industry. A programme of technical co-operation projects was designed to attract overseas technology, and if the first major investments attracted were in McDonald's hamburgers, Kentucky Fried Chicken and Procter and Gamble's toothpaste, this was at any rate evidence of its willingness to let business seek out opportunities; with increased emphasis on government and private research and development spending, the emphasis, it was hoped, would shift towards high technology before long (Liang [79], pp. 14 f.).

In the Republic of Korea, government influence over economic affairs was very much greater and more detailed. "The machinery of economic planning was larger, more elaborate, more centrally and prominently placed in the Republic of Korea Government's administrative hierarchy" and the planners made extensive and forceful use of a wide range of incentives, and of the dependence of business on bank lending, "to assure private industry's close compliance with their plans" (Scitovsky [13], p. 229). Business was far more concentrated in large conglomerates than in Taiwan Province, and the Government continually pushed investment and growth well above the rate that could be financed from domestic saving, at the price of almost chronic inflation and increasing foreign debt. But, as in Taiwan Province, for at least a decade from the mid-1960s, the thrust of industrial policy was to take full advantage of the Republic of Korea's relatively low labour costs in world markets for labour-intensive manufactures, with outstanding success. In the 1970s, as already pointed out (Scitovsky [13], p. 44), the emphasis for various reasons shifted towards more capital- and skill-intensive development, initially quite successfully. But in 1977 this shift was suddenly greatly accelerated and many costly mistakes were made. The petrochemical industry was given heavy

protection from imports, at the cost of higher prices to users, including exporters, reduction in the size of the domestic market and underutilization of capacity. More than $3 billion were invested in expansion of the merchant marine, with subsequent losses and bankruptcies. Overseas construction, especially in the Middle East, was encouraged to expand with rising oil prices, only to be in trouble when oil prices fell. "Picking winners" had not been difficult when low wage costs made labour-intensive industries an obvious target. It was another matter when it came to choosing among hundreds of heavier and technologically more sophisticated industries, each requiring the investment of very large amounts of capital.

Singapore industrial policy stood somewhere between that of Hong Kong and the Republic of Korea. Like Hong Kong, Singapore maintained free trade, encouraged a highly competitive domestic economy and followed a course of prudent demand management, keeping inflation well under control and avoiding foreign debt. But much more like the Republic of Korea, the Government in Singapore kept business on a tight rein. A variety of incentives, as well as monitoring and regulatory devices, were used to steer investment in what government policy-makers thought appropriate directions. As in the Republic of Korea, this worked well while comparative advantage lay obviously with labour-intensive export industries. It became more difficult when, in the late 1970s, Singapore's comparative advantage seemed to be shifting towards skill- and technology-intensive industries. Already in the early 1970s advantage had been taken of the oil boom to promote the creation of very large oil-refining capacity, and of Singapore's presumed comparative advantage in service industries to promote tourism and international finance. In 1979, as part of a new strategy of "economic restructuring", the National Wages Council deliberately began to raise wage levels to discourage low-skill, labour-intensive activities. By 1985, oil refining and the hotel industry were in deep trouble and, with rising domestic costs and sluggish world demand, economic growth came, temporarily, to a halt (Kirkpatrick [35] and [36]).

In the other four ASEAN countries where the move towards export-oriented manufacturing at various times during the 1970s had been carried out in the main by measures of trade liberalization and export incentives that involved no major direct government control of investment, the "Japan model" became a prominent theme in government thinking and public discussion about economic policy around 1980. In Malaysia in particular, "Look East" became a much-heard slogan (Awanohara [59]). One suspects that to many in the political leadership the appeal lay in the image of the Japanese as diligent patriots ready to subordinate personal interests to the common good. But the notion that Japan's economic success had been due to strong government guidance of the economy, as contrasted with western "laissez-faire liberalism", also fell on receptive ears. It served to justify a shift towards more interventionist industrial policies.

In all four countries, Governments, enticed by oil, gas and mineral resources, anxious to reduce dependence on a few labour-intensive export industries and impressed by the new priority accorded in the East Asian NICs to skill-intensity and high technology, adopted ambitious plans for heavy industry development. Malaysia's Fourth Plan of 1981 contained a heavy industry programme, including large automobile, cement, sponge iron, methanol, paper, engineering and petrochemical plants (UNIDO [25], p. 4). In the Philippines, the Government in 1980 embarked on a programme of eight "major industrial projects" based on exploitation of the country's natural resources with massive injections of foreign capital and technology (UNIDO [24], p. 6). Thailand's Fiftn Plan, adopted in 1982, contained a far-reaching Eastern Seaboard Development programme, including a large petrochemical complex (UNIDO [26]). In Indonesia where, with the financial resources and apparent opportunities created by the oil boom, industrial development had during the 1970s become increasingly capital-intensive, the lure of high technology found expression in the Nurtanyo project for the production of modern aircraft and other advanced equipment (Ariff and Hill [33]; Roepstorff [31]).

In Malaysia and Thailand, severe budget and balance-of-payments constraints in the less favourable conditions of the prolonged international recession compelled drastic cutbacks of these programmes in mid-term plan reviews (UNIDO [25] and [26]). In the Philippines, the "major industrial projects" had to be virtually abandoned as political and economic problems mounted. In Indonesia, too, the financial repercussions of declining oil prices required severe pruning of some of the more ambitious oil sector and other public investment plans, although the Nurtanyo project appears to continue to enjoy high priority in the allocation of resources.

It is too early to judge how these programmes will fare through the 1980s. The evidence so far does not suggest that "economic restructuring" ostensibly guided by the Japan model has been an unqualified success.

Helping losers. If one side of structural adjustment consists in finding the growth industries, whether through the market or through government attempts to pick winners, the other side consists in deciding what to do with the losers, the declining industries that are losing comparative advantage. It is here, rather than at the "sunrise" end of the spectrum, that the Japan model has so far shown itself markedly superior to general western practice. There has, in Japan and the East Asian NICs, been a greater willingness to phase out, rather than protect and attempt to resuscitate, "sunset" industries.

In the 1960s, as Japan was losing its comparative advantage in labour-intensive industries, business responded to market signals without major government initiatives in restructuring, except for some MITI help in coal mining, cotton textiles and wood industries (UNIDO [60]). As table 17 shows, the relative importance of textiles in Japanese manufacturing declined steeply, and there were

smaller falls in food processing and, in the 1970s, in the clothing, footwear and furniture industries (and changes within these and other industries that such aggregated figures do not reveal). Adaptation to changing comparative advantage proved relatively easy in a period of very rapid overall economic growth and was further facilitated by the flexibility and mobility of that part of the Japanese work-force not anchored in the core of lifelong employment. Outside Japanese agriculture, there was little organized political pressure for protection.

Table 17. Labour-intensive manufacturing industry in Japan, 1963, 1978 and 1981
(Percentages of total manufacturing)

Industry	Value of gross output			Number of employees		
	1963	1978	1981	1963	1978	1981
Food processing	10.1	9.7	8.9	9.6	9.5	9.5
Textiles	10.5	4.8	3.9	14.2	8.6	7.0
Clothing	1.3	1.3	1.1	2.8	4.3	4.2
Footwear	0.2	0.2	0.4	0.3	0.3	0.3
Furniture	0.8	1.0	0.9	1.6	1.7	1.1

Source: Yearbook of Industrial Statistics, various issues (United Nations publication).

The industries that ran into difficulties in the late 1970s presented much more serious problems of adjustment and redeployment of resources. The Depressed Industry Law of 1978 designated 14 industries as "structurally depressed", including aluminium refining and synthetic fibres hurt by high energy costs, shipbuilding by low world demand, electric furnace steelmaking, ferrosilicon and linerboard by low domestic demand, and spinning and chemical fertilizers hit by increased competition from the East Asian NICs (Uekusa and Ide [56], p. 17). The law called for a number of measures to assist structural adjustment in these industries, including collective capacity reduction (which was exempted from anti-monopoly legislation), a joint credit fund for the purchase of scrapped facilities and various measures to help displaced workers and depressed communities (Uekusa and Ide [56]). But the emphasis was on adaptation, phasing out or at least scaling down, not on protection or subsidies.

The same has broadly been true in the East Asian NICs, although not many tests have as yet come. In the Republic of Korea, employment in the food processing, textiles, footwear and furniture industries declined relatively between 1970 and 1978 and even absolutely in the next four years, but government industrial policy focused on the expanding capital-intensive industries and did nothing to halt the decline. The Singapore Government, as was

mentioned earlier, was quite prepared to close down the motor car industry when it showed no prospect of becoming internationally competitive, and has been content to use macro-economic measures, stepping up public works and reducing intake of foreign workers, to cushion the economy in the recent recession, rather than intervening in particular industries. In Taiwan Province, the Government has at times given special assistance to companies in trouble (Liang [29]), but the general stance of industrial policy has been to facilitate adjustment in line with market forces.

This cannot be said of the other four ASEAN countries without considerable qualification. Admittedly, all four in varying degrees opted for export-oriented industrial development in the 1970s, and the problem of phasing out modern industries has not yet presented itself in any of them. But in all four, market orientation of industrial policy has been qualified by non-economic objectives, least so in Thailand though even here regional balance and help to small-scale industry have been important considerations, much more so in Malaysia and Indonesia for the protection and promotion of indigenous (bumiputra/pribumi) vis-à-vis overseas Chinese enterprise, and both in Indonesia and the Philippines, where moves towards a more outward-looking and market-oriented industrial policy have had to contend with deeply entrenched protectionist sentiment and vested interests. In this respect, industrial policy in Indonesia and the Philippines still has more in common with its general tenor in most other developing countries (especially in Latin America) and indeed increasingly in recent years with many of the OECD countries, than with that of Japan and the East Asian NICs.

The contrast hinges, in essence, on the extent to which declining industries and other vulnerable groups are best served by an industrial and general economic policy which aims at rapid economic growth and flexibility or whether special protective measures are needed. In developed countries, protectionism is motivated primarily by a desire to maintain employment and alleviate social problems in industries adversely affected by technological change or for other reasons no longer able to compete internationally. While this sentiment is buttressed by powerful political pressures exerted by organized interest groups of capital and labour, it derives support from wide sections of public opinion; as Caves has said, the average citizen's objective function in most western countries must be interpreted as including a term for "the utility gained from the knowledge that fellow citizens have been treated fairly" (Caves [61]).

Even in Japan and the Republic of Korea, this combination of public sympathy and the working of the political market - reinforced in this case by defence arguments for self-sufficiency in food - has sustained protectionist policies for agriculture which cannot be justified on economic grounds. In Indonesia and Malaysia, protection and promotion of indigenous business has been the single most powerful motive for interventionist and regulatory industrial policies, although a good many other non-economic objectives - considerations of equity in the context of regional industrial development and fostering of small-scale industry, considerations of national autonomy in the control of foreign investment and of self-

reliance in support of neo-mercantilist commercial policy - have also played a part in both of these countries, as in the Philippines (Ariff and Hill [33]).

Economic analysis cannot refute the case for non-economic objectives of national policy. What the economist can do is to put up warning signals about the extent to which sentiment disguises rent-seeking by sectional interests and about the frequency with which well-intentioned industrial policies for non-economic objectives prove counter-productive. For one thing, policy cannot protect everybody; protecting some must hurt others. Unlike economic growth, protection is in practice almost always a zero-sum game. Sometimes it is possible to soften the shock and spread the costs of adjustment, through open or hidden subsidies paid for by taxpayers or consumers at large. But policies to protect property rights, in particular jobs or sunk capital, inevitably fail and merely add to the costs of adjustment deferred if the problems of an industry are not reversible.

Protecting jobs in an uncompetitive textile industry by protectionist barriers to imports may destroy more job opportunities in export and other industries (Lloyd [62]), and if the "vulnerable group" happens to be highly paid automobile workers equity is not obviously served by subsidies to the automobile industry (White [63]). In the long run, the most insidiously counter-productive effect of protection is that it deprives the intended beneficiaries of the incentive to help themselves; it encourages them to lobby for more protection rather than seek out market opportunities, and this applies as much to pribumi in Indonesia as to capital and labour in high-cost industries in developed countries.

In Japan and the East Asian NICs, industrial policy during the past quarter of a century has been relatively free of such avowedly protectionist measures (although, as was pointed out earlier, domestic industry has in practice enjoyed a good deal of de facto insulation from import competition, at least in Japan and the Republic of Korea). High priority accorded to economic growth and to efficiency over social objectives has been one factor in this; the relative weakness of organized pressure groups a second; the actual achievement of rapid economic growth, by facilitating continuous adjustment, a third. None of these three factors may be as effective in the future as in the past. With increasing affluence the weight in the mix of national objectives has already begun to shift from economic growth to various aspects of the quality of life; government dominance over organized pressure groups has probably weakened; and growth itself has slowed down. It may become more difficult to maintain the policies for industrial development which have been so conspicuously successful.

To consider future trends and policies from this point of view is the purpose of the final section.

H. The future: prospects and policies

The success of export-oriented industrial development in the East Asian developing market economies has been discussed in the

preceding sections. An attempt has been made to assess how much of this success must be attributed to unusually favourable conditions, domestically and externally, and how much to good policies. There remains the task in this section to consider what lessons, if any, the East Asian experience has for other developing countries. What are the prospects for export-oriented industrial development for the 1980s and beyond, in East Asia and elsewhere? How far is the success with which the strategy met in East Asia replicable elsewhere? What specific policies are most promising?

Prospects. Little need be added to what was said before about favourable domestic preconditions. Not that they were unimportant, in Japan and the East Asian NICs in particular. Unquestionably, one reason why the people of these countries and areas did so well was because of the sort of people they were - hard-working, thrifty, enterprising, relatively well educated, individually competitive, yet as communities socially cohesive. But, to repeat a point made before, such explanations in terms of historical and cultural factors, even where they are more than ex post rationalizations, carry no lessons for others because a country's history and culture cannot be imitated. Education may change people's behaviour and attitudes in ways more conducive to rapid industrial development, increasing affluence in ways less conducive, but such changes occur slowly and cannot easily be accelerated or retarded by Governments. For this reason, the more success can be traced to deliberate policy reforms which could be adopted elsewhere, rather than to immutable preconditions in history and culture, the better. Who, a decade ago, would have been bold enough to predict the outward-looking economic policies that have, in the 1980s, been adopted in China?

The external preconditions, the international economic environment, which the East Asian NICs enjoyed, raises much more pointed questions. Economic growth in the developed countries has slowed down considerably as compared with the high tide of the 1950s and 1960s and seems unlikely to regain such momentum soon, if ever. The problems this has presented to all developing countries with export-oriented industrial policies have been aggravated by resort to protectionist measures by Governments of developed countries under pressure, in conditions of high unemployment, to help their own high-cost industries. Higher tariffs, import restrictions, voluntary export restraint agreements and various kinds of invisible barriers adopted in almost all the developed market economies have particularly hit developing country exports of labour-intensive manufactures, such as textiles, clothing and footwear, but have also extended to more capital- and skill-intensive industries in which the NICs have become competitive, such as electronic and engineering products.

Reference has been made in earlier sections to the economic difficulties that all the East Asian developing market economies have encountered in recent years. The prolonged international recession slowed down their export growth, particularly to the countries of the European Economic Community, partly because their currencies - tied to the strong United States dollar - made their exports less competitive, and to the Middle East, with the slump in oil prices and earnings. Although exports to the United States

fluctuated with cyclical conditions in the United States economy, falling in 1982, bouncing back strongly in 1983 and 1984, but weakening again in 1985, the relatively open United States market has been the main source of continuing strength of world demand for East Asian manufactures. It accounted in 1984 for 35 per cent of Japanese exports, 50 per cent of Taiwan Province's, 45 per cent of Hong Kong's, 35 per cent of the Republic of Korea's and 20 per cent of Singapore's. But this dependence on the United States market may prove a source of weakness in the next few years. For the strong import demand has depended on continuous growth in the United States current account deficit, financed by a capital inflow that has helped finance a large and still growing fiscal deficit. If and when this situation ends, the East Asian export-oriented economies could be expected to bear the brunt (Mohs [64], Wade [32], Streeten [65]). The year 1985 was a bad one for all the East Asian developing market economies, and although 1986 was much better, there has continued to be only half-humorous talk about "export-led slowdown".*

But all this may be taking too myopic and gloomy a view. Similarly pessimistic prognoses were made for the export-oriented developing countries when the secular-boom decades of the 1950s and 1960s gave way to the turbulent decade of the 1970s, yet that decade, as shown earlier, brought even faster growth of both exports and GDP in these countries. Export pessimism is a common failing because in a world market economy it is always easier to identify the obstacles than the opportunities, and it is a failing to which those are most prone who in any case distrust market forces and prefer inward-looking policies.

A substantial part of the slow-down in economic growth in 1985 in Indonesia, Malaysia, the Philippines and Thailand was due to a virtual across-the-board decline in commodity prices - coffee, rubber, tin, palm-oil, timber, sugar and rice. Commodity prices were beginning to pick up in 1987, although prospects for the rest of decade remained uncertain, not least for oil.

With the exception of the Philippines and, temporarily Singapore, the East Asian developing market economies are still growing faster than most other market economies, developed or developing; and among other Asian developing countries, those which have in recent years adopted more outward-looking policies, such as China, India and Sri Lanka, are showing the highest rates of growth (see tables 2 and 3 above).

Certainly, much depends on the prospects for economic growth and a reasonably liberal trade régime in developed countries, especially the United States and Western Europe. While protectionist policies did not hold back East Asian exports of manufactures in the 1970s as much as had widely been feared (Hughes and Krueger [23]), such policies can still do much damage, both to export-oriented developing countries, and to economic efficiency and living standards of developed countries themselves.

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*See the Far Eastern Economic Review, 26 September 1985.

A special responsibility rests on Japan to open up its domestic market to exports of manufactures more effectively than hitherto. Japan has a potentially huge market for precisely the labour-intensive and simpler capital- and skill-intensive manufactures that many developing countries, not only in East Asia but also in South Asia and Latin America, can now produce increasingly competitively. Given Japan's large balance-of-payments surplus, it is difficult to believe that aggressive import liberalization, including action to prize open the domestic marketing structure by such measures as tax incentives to sell imported goods, coupled with moderately expansionary domestic monetary-fiscal policy, which would be helpful to the rest of the world, would pose any threats to Japan's domestic economic stability. One might add in parenthesis that a similarly valuable contribution to the industrial development of developing countries could be made by the countries of the Council for Mutual Economic Assistance, whose domestic markets remain relatively closed to manufactures from the developing market economies.

Taiwan Province and Hong Kong, in particular, have demonstrated that there is also increasing scope for South-South trade. Table 18 shows that developing country markets by 1983 accounted for almost 40 per cent of the exports of the East Asian NICs and for 33 per cent of those of the ASEAN countries. Exports of traditional products, such as textiles and clothing, from the NICs to other developing countries declined in the 1970s as the latter developed their own capacity, but exports of electrical machinery, resource-based and miscellaneous manufactures increased.

Countries which integrate their national economies into the world market economy are obviously more exposed to buffeting by cyclical fluctuations in economic activity in developed countries and other disturbances. But the historical experience of the past 40 years has clearly demonstrated that there is no net gain in insulation from the world economy through inward-looking policies. On the contrary, the evidence of relative economic performance of inward- and outward-oriented economies indicates strongly that the static and dynamic gains from international trade and factor flows on balance greatly outweigh the risks of vulnerability. The trend towards more outward-looking policies, even in Asian countries that had for long been wedded to inward-looking trade régimes, such as China, Pakistan, Sri Lanka and even Burma, suggests that, at least in Asia, this evidence has come to be accepted as convincing.

Policies. What policies - industrial policies in the widest sense - are most likely to minimize the risks and maximize the benefits of an export-oriented industrial policy?

The first point to stress is that export orientation and import substitution are not mutually exclusive. Import substitution goes on all the time in the course of economic development, as domestic capacity to produce goods and services efficiently improves. In countries at a very early stage of industrial development, such import substitution may need some infant industry protection. There may also be a case for a "second round" of import

Table 18. Destination of exports from the East Asian NICs and ASEAN, 1970, 1979, 1981 and 1983
(Percentages)

Destination	Exports of East Asian NICs a/				Exports of ASEAN countries b/			
	1970	1979	1981	1983	1970	1979	1981	1983
NICs	7.8	8.7	9.9	7.9	18.9	17.8	17.8	21.0
ASEAN b/	10.2	9.4	10.3	12.2	5.2	3.1	3.6	3.9
South Asia	0.8	2.5 c/	3.0 c/	3.1 c/	0.6	1.3	1.6	1.7
Middle East	1.5	5.7	5.9	6.2	1.2	1.6	2.3	2.0
Other developing countries	10.0	7.6	9.8	9.6	1.8	3.3	5.9	4.8
Japan	11.7	13.1	10.4	9.1	28.4	33.1	32.7	30.3
United States	31.8	26.5	25.9	31.5	19.6	19.3	17.7	18.7
Australia	2.3	2.5	2.7	2.2	1.8	1.4	1.8	1.2
European Economic Community d/, e/	15.0	16.2	13.1	10.9	15.4	14.5	11.3	11.0
Other developed countries f/	7.0	6.0	4.9	4.7	3.1	2.3	2.2	2.4
Total Pacific g/	63.8	62.7	59.2	62.9	73.9	76.0	73.7	75.1
Total developing countries	30.3	33.9	38.9	39.0	27.7	27.1	31.2	33.4
Total developed countries	67.8	64.3	57.0	58.4	68.4	70.6	65.7	63.7

Source: Commodity Trade Statistics, various issues (United Nations publication).

a/ As defined in United Nations commodity trade statistics.
b/ Excluding Singapore.
c/ Excludes exports from Taiwan Province.
d/ Including United Kingdom.
e/ Including Greece starting in 1981.
f/ Excluding centrally planned economies.
g/ Pacific trade includes trade with NICs, ASEAN, Japan, United States and Australia.

substitution in newly industrializing countries as and when they begin to lose their comparative advantage in labour-intensive industries. Such second-round import substitution may take the form of domestic production of capital equipment hitherto imported or of further processing of primary products for the home market or for export ("export substitution"), and it may justify some initial government encouragement and assistance. But it should not be the excuse for a return to inward-looking, protectionist policies. Assistance should take the form of incentives and subsidies rather than barriers to imports (and if the latter are needed at all, in the form of tariffs rather than import licensing), so that the new industries are from the beginning exposed to international competition. For the same reason, and to take all possible advantage of economies of scale, the new industries should be encouraged from the outset to seek export markets; subsidies should therefore, in part and preferably, consist of export incentives of various kinds. Where the new industries produce capital equipment, it is particularly important that they do not damage domestic user industries through high-cost or low-quality output (UNIDO [30]).

Similar considerations apply to structural adjustment from labour-intensive to more capital-, skill- or technology-intensive export industries, if and when the need for such adjustment arises. A good deal of pessimism has been expressed in various quarters in recent years about the market prospects for further expansion of exports of labour-intensive manufactures and about the capacity of any developing countries to compete with developed countries in export markets for capital- and technology-intensive manufactures. Protectionism in developed countries, as was emphasized above, is undoubtedly a matter of the most serious concern to countries that still depend mainly on comparative advantage based on low wage costs, and the market for their products may become even more competitive as a third and fourth generation of newly industrializing countries - including not only China and the countries of South Asia, but also developing countries in Africa, Latin America and the Middle East - seek to enter this market through the 1980s and 1990s. Not all will be successful. But judging by the experience of the East Asian NICs during the past two decades, success in this field may well do more for industrial and general economic development of many developing countries than any alternative strategy.

Pessimism about the capacity of newly industrializing countries to compete in world markets for more and more sophisticated manufactures is even less justified. That, after all, is how Germany, France and the United States contested the field with Great Britain in the latter part of the nineteenth century, and Japan and many of the Western European countries, including Austria, Belgium, Denmark, Italy, the Netherlands, Sweden and Switzerland, and more recently also Spain, Yugoslavia and others, established a comparative advantage in all kinds of specialized manufacture. The Republic of Korea in steel, shipbuilding, construction and transport equipment, Taiwan Province in electronics and electrical machinery, India in spinning and weaving equipment, Brazil in motor cars and military hardware - these are only the

most conspicuous examples of a new generation of industrial economies emerging from among the newly industrializing countries of the 1960s and 1970s.

Export markets do not fall like manna from heaven, nor can they be created by government intervention. Governments can help by providing incentives, to use the accepted euphemism for export subsidies, so long as they do not become too blatant and provoke retaliation. Particularly useful forms of indirect subsidy may be export credit, export insurance, and the provision of information and contacts through trade commission and similar services. But the task of marketing exports, which is much more demanding for manufactures than for primary commodities, and for more differentiated capital- and technology-intensive products than for the more standard labour-intensive ones, requires entrepreneurial initiative much more likely to be found in the private sector. While the large transnational corporations have the capacity to do their own marketing, smaller manufacturers in developing countries can be greatly assisted by specialized trading companies, such as have played so important a part in modern Japan and have operated effectively in the Republic of Korea. Other newly industrializing countries may find this a useful example to follow.

What lessons, with respect to specific policies, can be learned from the experience of the East Asian developing market economies? The analysis of this experience in the preceding sections has suggested a number of such lessons that may be summarized under three headings: the provision of public goods, macro-economic policy and industrial policy (in the narrower sense of policy directed at the structure of manufacturing industry).

The East Asian NICs owe much of their success to the fact that they have generally enjoyed efficient government. Their governments have been able to provide efficient administration and good infrastructure and have given high priority to education; and in varying degree the same can be said - at least relative to average developing country standards - of the other four ASEAN countries. Joan Robinson, noted socialist economist, inferred in one of her last publications from a comparative study of South-East Asian countries that "the degree of government action to be taken in an economy should be considered in the light of the efficiency and honesty of a Government; if a Government is not efficient and honest enough, it is far better to let markets express themselves, otherwise control will lead to more control, corruption, abuses and inefficiency" (Robinson [66], pp. 758-759). Even economists of a more market-oriented persuasion have conceded that interventionist policies may work if Government is in able hands. "In the Republic of Korea's practice ... potential dangers inherent in too much control over investment were avoided most of the time, thanks to exceptionally able and intelligent planning" (Scitovsky [13], p. 258). Unfortunately, the availability of exceptionally intelligent planners cannot be taken for granted. Even in the Republic of Korea, the Government at the end of 1970s made "serious mistakes which would probably have been avoided under less tight governmental controls" (Scitovsky [13]).

The presumption that education is good for industrial development may be largely an act of faith. A respect for education may be part of a generally achievement-oriented social ethos, so that its specific contribution to success in industrial development cannot be easily identified. Much depends on the kind of education. Comprehensive primary education not matched by further opportunities at secondary and tertiary level may lead to frustration and restlessness; generous provision of tertiary education may turn out unemployable graduates if demand and supply are ill-fitting. But all the East Asian economies - Japan, the Republic of Korea, Singapore and Taiwan Province, in particular - seem to have benefited greatly from an ample supply of manpower with a basic scientific and technological training.

Rather different issues arise in connection with the much discussed question of the role of government in the acquisition of technological know-how. Government expenditure on research and development has been relatively low in Japan and the East Asian NICs, where this has been left largely to private firms. It was Japanese private business that, from the Meiji period onwards, took the initiative in the acquisition of overseas technology, and this has broadly remained the case in Japan. Government-funded research and development expenditure reached 30 per cent of total research and development outlays in the 1970s, and its share has been declining since, while competition for the development of high technology has raised research and development expenditure in the private sector (Uekusa and Ide [56], p. 21).

Taiwan Province has in the past relied largely on the import of foreign technology through the continuous inflow of imported capital goods, although there have been suggestions that with the move towards high technology, Government will need to assume a portion of the risk by providing some research and development funds and encouraging collaboration between business and research centres (Liang [29], pp. 16 f.). In the Republic of Korea, the Government, to facilitate the development of industrial technology for capital goods production, in 1979 designated certain capital goods as "newly developed innovative machines" and offered special incentives for their production and purchase. The scheme attracted mostly small and medium-sized companies that developed many innovations in response to market needs, quality being controlled by an independent quality inspection laboratory. Singapore, more than the other East Asian NICs, has relied on direct foreign investment as the main channel for the acquisition of industrial technology. More recently, reverse direct foreign investment has become an interesting alternative device, exemplified by the establishment by Republic of Korea and Singapore electronics companies of subsidiaries in Silicon Valley, California, to learn more about the business.* Direct foreign investment and licensing arrangements have also become means whereby technical and management know-how spreads from the East Asian NICs, especially Hong Kong and Taiwan Province, to the other four ASEAN countries, especially

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*See The Economist, 28 April 1984.

Malaysia and Indonesia (Hughes and Parry [28], p. 26 f.). In these and other developing countries, the most important task for Governments is to encourage the development of a basic engineering infrastructure, training facilities and efficient workshops, so as to upgrade local capacity to absorb, apply and adapt new technology (UNIDO [30], vol. I, p. 61).

The chief prerequisites for industrial development in macroeconomic policy are undoubtedly prudent domestic demand management and policies to ensure freedom from balance-of-payments constraint. The Republic of Korea and Indonesia did well despite severe bouts of inflation, but it is difficult to believe that they would not have done still better had they managed to keep the domestic economy on a more even keel. A severe balance-of-payments constraint, with its vicious circle of overvalued currencies, trade and exchange controls and still larger deficits, has been the bane of economic and industrial development in many third world countries. In the East Asian economies, freedom from such constraints for most of the time has been both cause and result of export-oriented policies. The early establishment of a uniform exchange rate and abolition of quantitative import restrictions and exchange controls, usually accompanied by liberalization of financial markets, have been major factors in freeing exports and thus stimulating industrial development, while rapid growth of exports has in turn helped maintain a healthy balance-of-payments situation.

The unfortunate experience of several Latin American countries, especially Chile, following sudden liberalization of foreign trade and payments in the mid-1970s has led to some rethinking of appropriate policy packages. Questions have been raised, in particular, about the relative merits of sudden liberalization (which minimizes the opportunities for the formation of hostile coalitions) and gradual liberalization (which softens the shocks and hardships of adjustment); about the desirability of using the exchange rate for domestic price stability (for example, pegging the currency to a strengthening United States dollar) at the cost of eroding the competitiveness of traded goods industries; and about the danger of destabilizing capital flows following abolition of exchange controls (Donges and Hiemenz [48], pp. 23 and 36). The experience of Chile, where a sharply appreciating exchange rate, reinforced by rapidly rising real wages (fuelled by indexation to higher past inflation rates) and high interest rates, led to a disastrous outflow of capital, has suggested to some that restrictions on capital flows should be lifted only after trade has been liberalized (Donges and Hiemenz [48]). Similarly, the Republic of Korea is said to have succeeded in retaining the benefits of low interest rates without risk of capital outflow only by maintaining exchange control (Scitovsky [13], p. 236). The experience of many other developing countries, however, suggests that exchange control, ostensibly designed to control capital flows but extending inexorably to current account transactions, may be very damaging to trade. Indonesia has managed to avoid seriously destabilizing capital flows without having to reimpose exchange control.

There is, finally, the policy area of structural adjustment. This was fairly thoroughly discussed earlier and requires here only a brief summary of the two main conclusions. The first is that Governments are generally not very good at picking winners. The Governments of Japan and the East Asian developing market economies had little difficulty in deciding that low wage costs conferred a comparative advantage on labour-intensive export industries and then providing appropriate export incentives. But when it came to selecting potential winners among heavier industries, many mistakes were made. In the developed market economies of the OECD area, Governments have largely given up trying to find the future growth industries or products, a task they leave to large and small companies and these companies' research, development and marketing departments. It seems likely that the current vogue in South-East Asia for the "Japan model" will gradually give way to similar self-restraint. This of course does not mean that Government has no role to play at the "sunrise" end of the spectrum of structural adjustment. Government inevitably impinges at so many points on decision-making in the manufacturing sector - through its role in macro-economic policy, in banking and the capital market, in research and development and monitoring of foreign investment and licensing, in commercial policy and industrial relations - that Government and business depend on one another for information; and in practice non-economic aspects of national policy such as defence, and the political process, will almost always involve some degree of control by Government over business.

The second main conclusion is that Governments cannot help giving some assistance to losers. This is not because of any general presumption that redistributive or other social welfare policies are the best way of reducing poverty or inequality. The evidence of the East Asian economies rather goes the other way: it was rapid export-oriented industrial growth which, by raising real wages, did most, certainly in Taiwan Province and probably also in the other three East Asian NICs, to raise living standards and achieve a relatively even income distribution. But public sentiment and political pressures make it difficult for Governments to avoid giving some help to declining or depressed industries. The important lesson here is the desirability of helping labour and capital to move out rather than stay in such industries; to adjust rather than to dig in. If protection has to be given, it should be "credibly temporary" protection, preferably at rates "pre-set to decline" (Lawrence [67]).

It is in this respect that government industrial policy in the East Asian economies has been for the most part clearly superior to its counterpart in most other market economies, developed or developing. Government intervention, while often very intensive and detailed, has generally been designed to promote rather than to obstruct adjustment to market forces. It has, in that sense, to use the OECD phrase, consisted of "positive adjustment policies". To a much greater extent than in most other countries, it has followed the precept that the incentive structure of prices, in the markets for goods, capital and labour, should promote adjustment and thus industrial development. To quote a well-known saying by

Peter Timmer: "Getting relative prices right is not the end of development. But getting prices wrong frequently is" (quoted in Riedel [18], p. 43).

I. Scope for economic and technical co-operation among developing countries

UNIDO has devoted much effort in recent years to study and encouragement of economic and technical co-operation for industrial development among developing countries (UNIDO [68], [69], [70] and [71]). The rationale for this approach, apart from the universal support that "co-operation" commands in almost all human endeavour, is a desire to reduce dependence of the South on the North, especially because of what is seen as the reduced value of the North as an "engine of growth" for the South in the circumstances of slower world economic growth during the past decade (UNIDO [68], p. 103). It may therefore be desirable to add to the preceding sections on industrial policy in the East Asian developing economies a brief note on the light that East Asian experience throws on the scope for such co-operation.

Economic co-operation. East Asian experience is of particular interest in this context because it presents two strikingly different models. The three North-East Asian NICs, Hong Kong, the Republic of Korea and Taiwan Province, have pursued their export-oriented industrialization with their eyes on the world market, exploiting their comparative advantage in labour-intensive manufactures. Their main markets, and their main sources of technology and capital, have been in the industrial countries of the North. Economic co-operation with one another, or with other developing countries, has played virtually no part in their industrial strategies and policies.

By contrast, the countries of South-East Asia - including Singapore which resembles the North-East Asian NICs in other respects - have tried to combine increasingly export-oriented industrial development with regional economic co-operation. ASEAN was, in its original economic design, based on the case for regional integration that had been developed in Europe and Latin America in the 1950s (United Nations [72]). Its central thesis was that industrial development for an integrated region could overcome some of the limitations of small domestic markets. Regional integration was to be achieved mainly in three ways: intraregional trade liberalization; allocation among member countries of large industrial projects with preferential access to member countries' markets; and private sector co-operation in so-called "complementation" schemes in which each country would produce different components of a motor car or other complex product (Arndt and Garnaut [73]; Suhartono [74]).

ASEAN has been a resounding success, perhaps more so than any other regional grouping among developing countries. But its success has been in the degree of cohesiveness, of belonging together and unity of purpose, which it has engendered, especially in relations with the rest of the world, rather than in the practicalities

of economic co-operation. Here, results have so far been meagre. There has been progress in intra-regional trade liberalization measured by the large number of items on which tariffs have been reduced or eliminated, but the items have been almost entirely of no or minimal importance in mutual trade; the process of tariff liberalization has not yet touched major sensitive items, nor has it extended to non-tariff barriers. Of the five major public-sector industrial projects initially envisaged, only one, the Indonesian urea plant (which had already been planned as a national project), has been completed, and it is in difficulty. Nor have any of the private sector "complementation" schemes as yet overcome the obstacles to agreement as to which country should produce which component (Wawn [75]; Akrasanee [76]; Rieger [77]; Wong [78]).

Part of the difficulty of attaining more substantial results has been the disparity in industrial development and international competitiveness among the five original member countries, especially between Singapore and Indonesia. But underlying it has been the implicit perception in each country that its national economic interests were not necessarily best served by preferential treatment of the products of its ASEAN partners rather than by freedom to buy and sell in the world market. The likely costs of trade diversion have tended to outweigh the potential benefits of trade creation (Ariff and Hill [40]). ASEAN efforts to expand trade with other developing countries have frequently encountered trade barriers more intractable than those imposed by developed countries (Wadhva and Asher [79]).

This is not to decry the value of economic co-operation among developing countries, both neighbours and others further afield. Anything that removes bureaucratic and other obstacles to mutual trade in goods and services and jointly builds institutions that, by reducing information and transaction costs, improve the working of markets almost certainly benefits all concerned. But the ASEAN experience cautions against expecting a decisive contribution to industrial development from this approach.

Technical co-operation. While much new technology for agriculture has been developed by public or foundations-endowed research institutions that have made this knowledge freely available as a public good, the enormous complexity of modern industrial technology and high cost of research and development investment have caused new technical knowledge for industry to be almost invariably and universally subject to property rights, held by Governments or by private corporations. Since all but the very largest countries must acquire almost all new technology from abroad, the acquisition of new industrial technology involves a cost in foreign exchange, whether as licensing fees or as part of a direct foreign investment package, which can be burdensome on developing countries. Technical co-operation among developing countries has been suggested as one way of reducing their dependence on developed countries as the source of new technology and the cost to them of acquiring such technology (UNIDO [68]; Economic and Social Council for Asia and the Pacific [80]; Lall and others [81]).

The most obvious limit to what can be achieved in this way is the near-monopoly of new industrial technology held by developed countries, both market economies and centrally planned economies. But this monopoly is increasingly being breached with the progress of industrializing countries in the third world. Direct foreign investment by transnational corporations from newly industrializing countries, not least in other developing countries, has been an important new feature of the world economy in the past decade (Lall [82]; Dahlman [83]). Much of this investment has come from the East Asian NICs.

In the past two decades, the four East Asian NICs have developed substantial stocks of technically and scientifically skilled manpower that, while not yet capable of contributing major innovations in industrial technology, can apply and adapt new technology and establish a comparative advantage in skill- and technology-intensive industries - the Republic of Korea in steel and shipbuilding, Taiwan Province and Hong Kong in electronics and textiles, Singapore in ship and oil-rig repair and petrochemicals - at least vis-à-vis other countries and areas of the third world. This technological capability also enables them to play a role, still modest but growing, in transfer of technology to other developing countries, including the other four ASEAN countries, through direct foreign investment (Economic and Social Council for Asia and the Pacific and the United Nations Centre on Transnational Corporations [84]; Thee [85]). The fact that their own factor endowment is still closer to that of developing countries means that their technology may often be more appropriate than the very highly capital-intensive and sophisticated technology obtainable from the United States and other developed countries (Kojima [86], chap. V), although they lack the advantage of transnational corporations of developed countries in giving access to large home markets. In the wider sphere of managerial know-how and the essential business infrastructure of accounting, financial, trading and marketing skills, a good deal of interchange already goes on, in the form of inter-governmental technical assistance and services provided commercially, and is being promoted within ASEAN by various co-operative schemes (Akrasanee [76]).

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EXPORTS AND LABOUR ABSORPTION: THE CASE OF BANGLADESH MANUFACTURES

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Introduction

Export is a major source of providing foreign exchange for economic activities in general and industrial growth in particular. Export receipts cover a considerable part of the needs of developing countries for capital equipment, technical services and other goods essential to the accumulation process. The development of export-oriented industries is therefore one of the major components of the industrialization process. The effort to improve the external conditions of industrialization cannot be separated from the effort to mobilize all internal resources for economic growth. In Bangladesh, export promotion is encouraged so as to generate more foreign exchange to meet the increasing demand for imports and to repay external loans.

The experience of many developing countries has shown that industrial growth based on import substitution has been highly capital-intensive and has created few employment opportunities. Export-oriented industries of developing countries are frequently more labour-intensive than import-substituting industries. Banerji and Riedel [1] compared the experience of India and Taiwan Province of China from 1950 to 1970, during which time the two countries took very different paths towards industrialization. In Taiwan Province the industrial structure shifted towards labour-intensive industries, while in India it shifted towards capital-intensive industries, which explains in part the faster rate of employment expansion in Taiwan Province. An expansion in the export of manufactures may therefore be an ingredient of a policy for increasing labour absorption in the manufacturing industries.

The purpose of this paper is to assess the impact of the export of manufactures on employment in the economy of Bangladesh. In section A the relative importance of the export of manufactures in the total exports of Bangladesh is analysed and an attempt is made to determine some of the factors that contribute to the growth of manufacturing industry. The methodology used to measure the employment effects of exports is set out in section B. The standard input-output model is employed in this analysis and the factor

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content embodied in the export and import products is measured. The main findings and conclusions of the study are presented in sections C and D. The main sources of data used are given in the annex.

A. Export expansion and the causes of growth of manufacturing industry

Table 1 shows the extent to which Bangladesh relies on trade. There is a continuous deficit in merchandise trade. Exports represent a small proportion of gross national product (GNP), which varies from 2.4 to 6.3 per cent. Exports from Bangladesh have increased moderately since 1973. The export performance in dollar value has not been very satisfactory. In a régime of floating rates, the parity of the dollar with other major currencies may be undergoing regular and significant changes. But since the effective exchange rate* of the dollar remained on the whole stable between 1973 and 1978, dollar values may be used as approximate measures for the exchange earnings of Bangladesh during that period.

Foreign exchange earnings from manufactures formed the major portion of total export earnings, their share ranging between 60 and 68.5 per cent from 1974 to 1979. Textile industries alone covered from 90 to 96 per cent of the exports of all manufacturing industries. Within the broad categories of manufactures according to the Standard International Trade Classification (SITC), basic manufactures (SITC 6) continued to have a dominating position. Their share varied from 60 to 66 per cent during the period considered. The export share of non-jute goods such as tea registered some increase since 1973. The relative share of non-manufactures in total exports was far less.

Although the contribution of the manufacturing industry to gross domestic product (GDP) was small, export expansion was dominated by manufactures. It is worthwhile to examine the contribution of exports to the growth of the manufacturing industry. The approach of Chenery, as stated in Lin and Lin [7], is followed in order to evaluate the effect of export expansion on the growth of manufacturing output. The growth of such output is broken down into an import-substitution effect, a home-demand effect and an export-expansion effect.

Symbolically, the growth of manufacturing output ($\dot{Q}$) can be written as

$$\dot{Q} = (u_2 - u_1) S_2 + u_1 \dot{H} + u_1 \dot{E} \qquad (1)$$

= (Import-substitution effect) + (Home-demand effect) + (Export-expansion effect)

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*See Reza ([2], p. 280). The effective exchange rate is an index combining the exchange rates between the dollar and 20 other major currencies, with weights given in the multilateral exchange rate model of the International Monetary Fund.

Table 1. Pattern of exports from 1973/1974 to 1981-1982

Year	Exports as percentage of GNP (1)	Imports as percentage of GNP (2)	Exports in constant 1972/1973 prices (millions of dollars) (3)	Annual real compound rate of growth of exports since 1973/1974 (percentage) (4)	since 1975/1976 (percentage) (5)
1973/1974	4.13	10.34	353.9	-	-
1974/1975	2.42	5.85	289.1	-20.2	-
1975/1976	5.13	17.60	359.7	0.8	-
1976/1977	5.91	12.79	371.6	1.6	3.9
1977/1978	5.63	15.51	387.1	2.2	3.7
1978/1979	6.33	16.16	378.8	1.4	1.7
1979/1980	6.27	20.59	363.2	0.43	0.24
1980/1981	5.76	20.51	404.5	1.9	2.4
1981/1982	5.58	22.97	424.6	2.3	2.8

Year	Share of manufactures a/ in total exports (6)	Share of basic manufactures b/ in total exports (7)	Share of textiles c/ in manufactured exports a/ (8)	Annual real compound rate of growth of tea exports d/ since 1973/1974 (percentage) (9)	since 1975/1976 (percentage) (10)
1973/1974	68.4	..	..	-	-
1974/1975	68.5	66.4	95.5	8.8	-
1975/1976	62.3	59.8	95.2	1.8	-
1976/1977	60.3	56.4	92.9	10.4	27.6
1977/1978	66.0	60.4	89.7	7.1	12.4
1978/1979	67.3	63.9	92.7	4.7	6.6
1979/1980	..	..	..	1.7	1.7
1980/1981	..	..	..	4.6	5.8
1981/1982	..	..	..	4.7	5.6

Notes: Columns 1 and 2 are calculated from [3], table 2.4, p. 116. Column 3 is from [3], table 3.6, p. 125. Columns 4 and 5 are calculated from column 3. Column 6 is from [4],p. 116. Column 7 is from [4], [5] and [6]. Column 8 is calculated from [4]. Columns 9 and10 are calculated from [3], table 3.6, p. 125.

a/ Major division 3 of the International Standard Industrial Classification of all Economic Activities (ISIC).

b/ Section code 6 of the Standard International Trade Classification.

c/ ISIC division 32.

d/ In 1972/1973 dollars.

where Q, H and E stand respectively for the increase in domestic production of manufactures, home demand for manufactures and exports of manufactures.

$S = Q+M$ = Total supply of manufactured goods

where M stands for imports and Q for domestic production of manufactures.

$u = Q/S$ = The share of domestically produced manufactures in the total supply (also called the degree of self-sufficiency)

$(1-u)$ = The degree of import reliance

Subscripts 1 and 2 refer respectively to the initial and terminal years of the period concerned. In this case, subscript 1 refers to the period 1965/1966, and 1976/1977 for subscript 2.

The growth of manufacturing output, which consists of an import-substitution effect, a home-demand effect and an export-expansion effect, is based on the assumption that u, that is, the degree of self-sufficiency, is kept at its initial level in both the home-demand and export-expansion effects.

As the impact of these relative effects on the growth of manufacturing output is not based on the causal relationship between them, the results have to be viewed with qualifications. The three relative effects of increased home demand, export expansion and import substitution are calculated for nine major manufacturing industries between 1965/1966 and 1976/1977 and presented in table 2. For total manufacturing output,* the home-demand effect (69.6 per cent) is the most important factor contributing to the expansion of manufacturing output. This was not expected because in Bangladesh, as in most developing countries, an import-substitution strategy was followed at least during the early stages of industrialization. This finding based on total manufacturing output obscures the real picture because the relative importance of import substitution, home demand and export expansion is different for different manufacturing industries, as shown in table 2.

Bangladesh is one of the world's largest exporters of jute goods and raw jute. In 1976/1977, 99.5 per cent of world exports of raw jute and 34 per cent of jute goods were from Bangladesh [5]. As expected, the relative effects of export expansion on the output of jute textile, tea manufacturing and leather industries are approximately 101, 84 and 98 per cent respectively, which shows that these three industries are highly export-oriented. Products such as sugar, tobacco and paper are produced mainly to meet local needs, and the relative effect of home demand, measured at 94 per cent for

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*As covered in the Census of Manufacturing Industries [8].

Table 2. Relative effects of increased home demand, export expansion and import substitution on manufacturing output of selected industry groups between 1965/1966 and 1976/1977 (Percentages)

Item	Effect of home demand	Effect of export expansion	Effect of import substitution
Total manufacturing output	69.6	19.9	10.5
Tea manufacturing	15.84	83.58	0.57
Sugar	147.50	1.37	-48.87
Tobacco	93.70	5.78	0.52
Jute textiles	-0.95	100.95	0.00
Cement	26.70	0.0	73.30
Machinery	6.87	0.03	93.15
Transport equipment	43.71	-0.004	56.29
Leather	0.18	97.78	2.04
Paper	90.02	-13.71	23.69

Notes: Figures for 1965/1966 are from [9].

Figures for exports and imports of 1976/1979 are from [4], [5] and [6].

tobacco and 90 per cent for paper industries, is high. The industries that owed their expansion to the import-substitution effect were the cement, machinery and transport equipment industries. The export-expansion effect for these industries was negligible. The home demand effect for machinery was very small (7 per cent), but for transport equipment and cement it was about 44 per cent and 27 per cent respectively.

B. Theoretical framework for the analysis of labour absorption in the production of manufactures for exports

1. Methodological remarks and assumptions

According to the factor proportions theory (H-O-S), a welfare-maximizing country will specialize in the production of goods that use more intensively the factors of production that are relatively

abundant in that country. Hence an increase in exports from countries with a relative abundance of labour and a scarcity of capital to countries with an abundance of capital and a scarcity of labour will tend to favour labour-intensive industries and thus improve employment. Different studies ([11], [12], [13]) have provided conclusive evidence that the pattern of exports of developing countries is strongly concentrated on labour-intensive manufactured products. A study [11] by Lydall, which was confined to 12 selected manufactured and semi-manufactured products, has indicated that in general, the lower the level of development, the larger the number of jobs generated by a given increase in exports. This also suggests conformity with some of the implications of the factor proportions theorem.

A conceptual framework for analysing the likely effects on employment of an increase in exports has been developed by a number of economists ([11], [14]). The open input-output system is judged the best available analytical framework to estimate labour requirements for producing manufactured exports. The major advantage of the input-output framework is that indirect and total backward linkage effects can be taken into account. The linkage effects heavily depend on the assumption that the domestic economy is able to supply a significant proportion of necessary raw materials or semi-processed manufactures to the export industry so that some sort of balanced growth of various industries may be maintained. Thus the expansion of a certain industry can lead to cumulative rounds of demand for the output of other industries, resulting in cumulative rounds of employment creation. A situation can also be imagined in which the backward linkages are so great (or are so labour-intensive) that the total employment effects of exporting a capital-intensive product could be greater than those of exporting a directly labour-intensive one. The indirect effects may be relatively unimportant in a developing economy where there exists a low degree of industrial diversification and economic interrelatedness. The inclusion of indirect effects, however, becomes highly important for a developing country with a high degree of interrelatedness. The analysis in this paper will be mainly concerned with total effects.

The underutilization of industrial capacity is a common feature in most developing countries. If hign levels of capacity underutilization are related to either demand or import supply, export expansion would allow greater utilization without additional investment. If there is a continuous increase in demand, investment will be needed at some point.

Although there exists excess plant capacity in many developing countries, the excess labour capacity of those countries is even greater. Widespread unemployment and underemployment are indicators of the existence of generalized excess labour capacity. If such unused manpower were employed, the production of a wide range of different goods and services would be increased on the following two conditions: there is adequate effective demand for the products; and sufficient organization, skill and capital equipment are forthcoming from either domestic or foreign sources to complement the available supplies of unskilled labour [11].

The existence of excess plant capacity implies that if export demand were to increase, the employment effects within these industries would, in the first instance, be less pronounced than they would otherwise be. For example, output might be increased to a certain degree largely by taking on additional workers, with little or no increase in overhead staff. But if the expansion were to continue, there would soon come a point where employment* in all grades of staff would need to be increased. Thus, the existence of excess plant capacity in certain industries in developing countries creates some problems for the measurement of the employment effects of an expansion in their exports. These are problems only for the transition from a level of unusually high excess plant capacity to a level of normal capacity use. The utilization of capacity at a normal level can be achieved fairly quickly if the expansion in exports were both continuous and substantial.

Leontief's input-output technique is used in the analysis presented in this paper. The Leontief input-output model makes several assumptions:

(a) A given product is only supplied by one sector, in other words, joint products are ruled out. This means that each industry produces only one commodity and each commodity is produced by only one industry;

(b) The quantity of each input used in production by any industry is proportional to the level of output of that industry. The input function is linear. The linear input functions imply that the marginal input coefficients are equal to the average. This is based on the following two closely related but distinct assumptions: there are constant returns to scale; and no substitution among inputs is possible in the production of any good. Since there is only one process or method of production in each industry, the level of output determines the level of each input required;

(c) The total effect of carrying on several types of production is the sum of the separate effects. This is known as the additivity assumption, which rules out external economies and diseconomies.

Technically, the production process is characterized by constant technical coefficients of production, that is, each additional unit of new output is produced by an unchanging proportional combination of material inputs from different industries. This implies no technological change in the sectoral production processes. Thus the technologically observed relationship between inputs of goods and primary factors and output remains constant. The assumption of fixed input coefficients would have to be relaxed to the extent that technological change or changes in prices or

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*This includes employment in industries producing investment goods; especially if the expansion encourages the building of additional plant and the establishment of new firms.

increasing costs induce substitution. The assumption of a single production process rules out the possibility of choosing the optimal technique of production. The aggregation of firms of different size into a single industry further limits the practical application of input-output techniques with regard to employment projections. The size of the firms can be critical in determining whether a given increase in output will have a major or a minor effect on job creation. On the other hand, the aim of aggregation is to produce minimum average error for all the production and employment totals of the solution.

The absence of substitution among inputs might be explained on one of two grounds: either the technology is such that no substitution is possible, or relative prices do not change, so that it is not efficient to alter input proportions regardless of the shape of the production function.

2. Mathematical method of estimating employment through exports

(a) Total labour absorption

Because of the difficulty of obtaining separate data for input coefficients of production specified for export or for domestic consumption, it is assumed that the same quantity of labour is necessary, whether the goods are for export or not. It is also assumed that there is a unique relationship between input used and the amount of total output produced by a particular industry. The level of employment in each industry is therefore related to the amount of total output produced by that industry. Thus, to find the amount of labour employed in industry j, it suffices to multiply the corresponding labour coefficient l_j by the total output X_j of that sector. The labour coefficient calculated for each industry is as follows:

$$l_j = L_j / X_j \qquad (2)$$

where L_j = Level of employment in j
X_j = Total output of j

The total industrial employment is then given by the expression,

$$L = \sum_{j=1}^{n} l_j X_j \qquad (3)$$

where L represents total industrial employment.

$$BL = [BL_j] = [l]\,[I - A]^{-1} \qquad (4)$$

where BL = Row vector of total labour (direct and indirect) coefficients used by industry j. It is also called the backward employment linkage effect. The direct and indirect labour requirements per unit of final demand may be interpreted as a measure of labour absorption per unit of final demand in each industry.

$l = [l_j]$ is the row vector of coefficients of direct labour used by industry j.

A = Input-output technical coefficient matrix

$(I-A)^{-1}$ = Leontief inverse matrix (direct and indirect requirements of labour per unit of final demand)

The indirect labour coefficient for an industry j may be expressed as

$$IL_j = BL_j - l_j \tag{5}$$

The indirect and the corresponding direct labour coefficients should also be estimated by the following method,* where direct and indirect effects are both expressed in terms of final demand.

Equation (4) may also be written as

$$BL = [BL_j] = l' \, [I-A]^{-1}$$

where l' is the diagonal matrix showing the labour coefficents along the diagonal.

$$\text{Now let } BL = \begin{bmatrix} l_1 & 0 & 0 & 0 & 0 \\ 0 & l_2 & 0 & 0 & 0 \\ \cdots & \cdots & \cdots & & \\ 0 & 0 & 0 & l_n & \end{bmatrix} \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nn} \end{bmatrix}$$

$$= \begin{bmatrix} l_1 & r_{11} & l_1 & r_{12} & \cdots & l_1 & r_{1n} \\ l_2 & r_{21} & l_2 & r_{22} & \cdots & l_2 & r_{2n} \\ \cdots & \cdots & \cdots & \cdots & & \cdots & \\ l_n & r_{n1} & l_n & r_{n2} & \cdots & l_n & r_{nn} \end{bmatrix}$$

The coefficient of indirect labour for an industry j is expressed as

$$\hat{IL}_j = \sum_{i=1}^{n} l_i \, r_{ij} - l_1 \, r_{1j} \tag{6}$$

and the corresponding direct labour coefficient for industry j is written as

$$\hat{l}_j = BL_j - \hat{IL}_j \tag{7}$$

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*This method was suggested by R. Van Straelen of UFSIA, University of Antwerp, Belgium.

The labour employment generated through manufactured exports may be written as

$$LE = [l'] (I-A)^{-1} [E] \quad (8)$$

where LE = Column vector of the direct and indirect labour required to produce manufactured exports for n industries

and E = Exports of manufactures in the form of column vectors

Bias may arise due to the overestimation of the total employment required for manufactured exports. The labour-output ratios by industry will decrease in accordance with the growth rates of average labour productivity. The growth of total employment attributable to manufactured exports is affected by different rates of productivity by industry and export growth. With slower productivity growth in the more labour-intensive industries, the employment effects are greater. Similarly, a changing export composition in favour of more labour-intensive commodities ceteris paribus will generate more employment.

Within a given industry, exports may well be less labour-intensive than domestic market sales because of generous subsidies given for investment in export industries. As a result of the provision of duty-free imported inputs in export-processing zones, the relative import content will be increased. Consequently, there will be reductions in the domestic inputs for export production and in the indirect employment generated, resulting in an overestimation of the labour requirements for exports. In 1976 there were no export processing zones in Bangladesh, but a decision was taken in 1980 to establish one in the port city of Chittagong.

The $(I-A)^{-1}$ matrix explicitly assumes that all intermediates are domestically produced, but it is always possible to use imports of intermediate inputs. The indirect effects on domestic resources, labour and capital are moderated through leakages from imports. To estimate the total employment effect of output expansion, the coefficient matrix A should relate only to domestic intermediate inputs purchased per unit of output.

To estimate the total employment effect of output expansion with the help of a matrix of technically determined input coefficients, including both imported and domestically produced intermediate inputs, the assumption can be made that either non-competitive imported inputs will be domestically produced within a certain period of time, or the technical coefficient matrix should be based on domestically produced inputs only. In this paper, the 1976/1977 input-output table of Bangladesh, prepared by the government planning commission, has been used for the empirical analysis. It is the latest available input-output table. Market prices have been used in recording the transactions in the input-output table,

and the intermediate input* flows include both domestically produced intermediate inputs and also imported inputs.

(b) Unskilled labour absorption

The labour generated through manufactured exports in equation (8) consists of both skilled and unskilled labour combined. It would be useful to deal separately with unskilled labour in order to discover the extent to which manufactured exports depend on it. The absorption of unskilled labour by each industry will be measured and these variables will be correlated with the exports of the different industries. By substituting unskilled labour coefficients for all labour coefficients in equations (2) to (7), the following equations for unskilled labour absorption are obtained:

$$L^U = [L^U_j] = [l^U] \, [I-A]^{-1} \qquad (9)$$

= Row vector of coefficients of total (direct and indirect) unskilled labour used by industry j

$$l^U = [l^U_j] = \text{Row vector of coefficients of direct unskilled labour expressed in man-years per taka of output} \qquad (10)$$

l^U_j = Direct unskilled labour coefficient for industry j

The indirect unskilled labour coefficient may be expressed as:

$$IL^U_j = L^U_j - l^U_j \quad \text{for industry j} \qquad (11)$$

$IL^U = [IL^U_j]$ = Row vector of coefficients of indirect unskilled labour

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*The intermediate inputs required by an industry can be divided into non-competitive imported inputs and domestic inputs. Non-competitive inputs are commoditites that are not produced domestically but are required for production. The larger the proportion of non-competitive inputs, the weaker the link between the industry and other producers, since production will call for additional imports (foreign production) rather than for domestic production. Some non-competitive imported inputs are needed because they may be technologically impossible to produce at home. For example, superior-quality cotton is imported into Bangladesh since it cannot be produced locally for climatic reasons. There may exist technological constraints on the production of non-competitive imported inputs at home because there is a limit, over a given time period, on the rate of growth of the corresponding domestic industry. Machinery imports into Bangladesh for use in many industries may be cited as an example.

The corresponding equations of indirect unskilled labour coefficients using the other method are expressed as:

$$\hat{IL}_j = \sum_{i=1}^{n} l_i^U r_{ij} - l_1 r_{1j} \text{ for industry } j \qquad (12)$$

The corresponding direct unskilled labour coefficient for the same industry j is expressed as:

$$l_j^U = L_j^U - IL_j^U \qquad (13)$$

Similarly, unskilled labour employment generated through manufactured exports may be expressed as:

$$LUE = [1^U] [I-A]^{-1} [E] \qquad (14)$$

where LUE = Column vector of direct and indirect unskilled labour generation

and 1^U = Diagonal matrix with unskilled labour coefficients in the diagonal

3. Impact of trade on employment

The net effect of foreign trade on the level of employment for the year 1976/1977 will now be considered.

It is measured [15] by N^n

$$\text{where } N^n = (LE/E)/(LM/M) \qquad (15)$$

E = Total value of exports

M = Total value of imports

$$LE = [1] [I-A]^{-1} [E] \qquad (16)$$

$$LM = [1] [I-A]^{-1} [M] \qquad (17)$$

and [1] = Row vector with elements of direct labour coefficients per unit of output for n industries

$[I-A]^{-1}$ = Inverted Leontief matrix

[E] = Column vector of exports for n industries

[M] = Column vector of imports for n industries

If N^n is greater than 1, it may be concluded that the structure of foreign trade of the economy is such as to increase the level of employment. Alternatively, N^n may be interpreted as a measure of the effect that one taks of balanced trade has on the level of employment.

4. Factor intensi ad the H-O-S theorem

It is now common to make empirical measurements of the factor content embodied in export and import products. Sometimes direct and sometimes total (direct plus indirect via intermediate inputs) factor intensities are used in empirical tests of the factor proportion hypothesis of international trade theory. Recently, Hamilton and Svensson [16], on the basis of theoretical analysis, have shown that the direct factor intensities are relevant for the allocation of gross production, whereas total factor intensities are relevant for the explanation of trade flows.* "Trade will be the difference between gross output and the sum of consumption and goods input into the production, or, equivalently, the difference between net output and consumption. The average factor intensity of consumption may reflect the world factor intensity. The average total factor intensity of the country's net output will of course equal the country's factor intensity. In that sense, trade still depends on total factor intensities and differences in relative endowments between the country and the world" [16]. In this paper, total factor intensity is used to examine the employment implications of exports of manufactures. For this purpose, the following equation has been defined [15]:

$$(K/L)^e = k^e = \frac{k\ (I-A)^{-1}\ E}{l\ (I-A)^{-1}\ E} \qquad (18)$$

where k is a vector that measures the amount of capital used per unit of output in each industry.

Similarly,

$$(K/L)^m = k^m = \frac{k\ (I-A)^{-1}\ M}{l\ (I-A)^{-1}\ M} \qquad (19)$$

and $\phi = k^e/k^m$, $\phi > 0$ (20)

Thus (18) is a measure of the capital-labour ratio in exports while (19) measures the capital-labour ratio in imports. Finally, (20) is an index of the capital-labour ratios in exports versus imports. If ϕ is less than 1, exports are labour-intensive relative to imports. The opposite holds if ϕ is greater than 1.

The Heckscher-Ohlin-Samuelson model (H-O-S) implies that the composition of trade is determined by relative labour and capital endowments of countries and the relative factor input requirements of the products. Therefore, countries with a relative abundance of capital should export goods produced capital-intensively and import

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*They assume the absence of factor intensity reversals and of factor price equalization. There is a tendency for a country to specialize in the production of goods whose factor intensities, loosely speaking, are closely related to the relative endowments of the country.

goods produced labour-intensively, and vice versa for countries with relatively abundant labour supplies. The H-O-S theorem is a proposition on the pattern of trade under conditions of free trade and perfect competition between two countries. It can be stated in its simplest form as follows:

$$\text{if } \left(\bar{K}/\bar{L}\right)^{A} > \left(\bar{K}/\bar{L}\right)^{B}, \text{ then } \phi^{A} > \phi^{B} \qquad (21)$$

The bar over the variables K and L refer to total endowments of capital and labour, respectively, and A and B denote two countries. Therefore, in order to test the H-O-S theorem, the following is required:

(a) Knowledge of the relevant variables of countries A and B to be able to make the comparison established in (21);

(b) Knowledge of what the pattern of trade would have been between A and B under free trade and perfect competition.

More than 62 per cent of the foreign trade of Bangladesh took place with North America, Europe and Japan in 1978/1979, and in 1976/1977 and 1977/1978 the percentages were approximately 56 and 59 per cent respectively [17]. These countries may be regarded as "capital-abundant" countries in relation to Bangladesh. Hence, by examining the values of ϕ for Bangladesh, the above-mentioned requirement (a) is met. It seems difficult to meet requirement (b). It may be objected that the trade patterns actually observed need not coincide with trade patterns that would have been observed under free trade. But it is also true that the exports of developing countries are concentrated on labour-intensive products. It thus seems reasonable to use the above equations to calculate ϕ.

(a) Leontief paradox

The intention here is not to provide an empirical verification of the factor proportions theory, but rather to determine the employment implications of exports of manufactures in Bangladesh. Nevertheless, it is worthwhile to mention the influential empirical study* of Leontief published in 1953 and 1956. Leontief showed that, despite being richer in capital endowment than the rest of the world at large, the United States of America exports labour-intensive products in exchange for capital-intensive imports. Leontief found that, on average, $1 million of United States exports required $14,300 of capital per man-year, while, on the other hand, $1 million of United States imports could have been produced domestically for $18,200 of capital per man-year. The finding stood in sharp contrast to the traditional theory according to which a country should export commodities that make intensive use of its abundant factors of production and import goods using intensively its scarce factors.

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*Summarized in [18], p. 61.

The literature on international economics includes different works that seek to determine the validity or invalidity of the Leontief paradox, from both an empirical and a theoretical point of view [12], [18], [19], [20], [21]. The measure of factor intensity used by Leontief mixes up the two factors (skilled and unskilled labour), one of which is abundant in the United States while the other is not. Since the United States has an abundant supply of both capital and skills, it is assumed that the Leontief calculations would show the United States to be an exporter of capital-intensive and an importer of labour-intensive products. Isolating skilled labour from unskilled labour in Leontief's data, Rahaman's study ([7], p. 59) shows that the paradox is reversed. Therefore, with the correct definition of factor intensity and factor abundance, the expected result is found.

Leamer [20] has argued that calculations of the factor requirements of trade based on Leontief are misleading if more than two commodities exist. On the basis of Vanek's [22] generalization of the H-O model to n goods and factors, Leamer argues that the Leontief criterion would hold for many commodities only if the net export of capital services were positive and the net export of labour services negative. If this is not the case, the proper comparison will therefore be between capital per man embodied in net exports and capital per man in consumption. The empirical work of Stern and Maskus [21], which used the above-mentioned conceptual framework of Leamer, showed that in recent years (for example, 1972), the Leontief paradox has tended to disappear in the American case.

5. Investment linkages

The mathematical formulations of the input-output framework in this paper measure the indirect and total (direct and indirect) effects using intermediate inputs only and employing the Leontief inverse matrix. It is also possible within the input-output system to find total (direct and indirect via investment, in other words, backward linkage through investment) capital use in each industry. The analysis of the investment linkage is important in an exercise where employment implications of exports of manufactures are considered. An increase in final demand arising from an increase in investment will call for an increase in the production of the industries supplying investment goods. This will have an impact on employment generation.

This paper is concerned with manufacturing activities. Only four out of 10 industries - metal products, machinery, transport equipment and wood - deliver investment goods as stated in the 1976/1977 input-output table [23]. The other six industries supplying fixed capital for investment - urban and rural housebuilding, non-residential building, and construction for electricity and gas, for transport and for other purposes - remain outside the scope of the present analysis. The employment potential of manufactured exports due to backward linkage through supply of investment goods is not covered in this analysis.

C. Findings

1. Total labour absorption

The direct labour of all types used by each industry is presented in the first column of table 3. It is calculated as the average of each industry's man-years per 1 million taka of output. The direct plus indirect labour requirements per unit of final demand as presented in the fifth column of table 3 may be interpreted as a measure of labour absorption per unit of final demand in each industry. An examination of the direct labour requirements shows that the jute textiles, tea, wood and cotton textiles industries use the highest amount of labour in relation to other industries. The indirect labour requirements ($\bar{IL}$) are also high in jute and cotton textiles, followed by miscellaneous manufacturing and pharmaceutical industries. The Spearman rank correlation coefficients (table 3) between direct and two indices ($\bar{IL}$ and $\hat{\bar{IL}}$) of indirect labour requirements of 20 industries are 0.30 and 0.03 respectively, which shows that the indirect labour requirements of each industry in the industrial structure of Bangladesh are not closely related with its direct labour requirements. The rank correlation coefficient ($r = 0.93$) between direct and total labour requirements is significant. This implies that indirect effects do not change the rankings of the industries, and the relative importance of the direct component in total employment requirements is considerable.

Table 4 shows that the largest employment is generated in the jute textile industry, which contributes about 86 per cent of the total employment generated by exports. The tea industry comes next with 6.14 per cent, followed by miscellaneous industries, leather and other chemicals. The correlation coefficient between industry shares of employment required to produce goods equivalent to the value of exports in 1976/1977 and the total labour absorption in each industry is 0.61, which is highly significant ($t = 3.27$). This result indicates that labour absorption through manufactured exports is positively related to the absorption of more labour per unit of output. The share of each industry in the exports of 20 industries for 1976/1977 is shown in tables 4 and 5. There is a positive association ($r = 0.56$, $t = 2.87$) between the industries' export shares (table 4) and the total labour absorption (BL in table 3), showing that the industries with a high share of exports absorb more labour per unit of output. This finding is not surprising for a country like Bangladesh. It is in line with the factor proportions theory. The correlation coefficient between the industry share of exports and of employment due to exports would obviously be high, and it is found to be 0.98. A similar observation seems to remain valid for 1977/1978 and 1978/1979, on the basis of the labour coefficients and input-output table of 1976/1979 (table 5).

Table 3. Total labour required in each industry to satisfy final demand, 1976/1977
(Man-years per million taka of output or final demand)

Industry	Direct labour 1	Direct labour $\hat{1}$	Indirect labour IL	Indirect labour $\hat{IL}$	Direct and indirect labour (BL)
Tea	38.60	38.73	4.77	4.64	43.37
Sugar	14.20	14.20	1.43	1.43	15.63
Edible oils and fats	5.70	5.70	0.89	0.89	6.59
Tobacco	2.70	2.70	3.52	3.52	6.22
Other food	12.56	12.67	3.20	3.09	15.76
Cotton textiles	35.70	51.01	20.49	5.18	56.19
Jute textiles	49.70	68.01	20.19	1.88	69.89
Paper	19.80	21.98	7.88	5.70	27.68
Leather	5.00	5.84	4.90	3.06	8.90
Fertilizer	6.50	6.51	8.75	8.74	15.25
Pharmaceuticals	11.70	12.63	15.05	14.12	26.75
Other chemicals	21.20	24.79	7.10	3.51	28.30
Cement	2.60	4.03	7.06	5.63	9.66
Basic metals	4.20	7.06	6.47	3.61	10.67
Metal products	15.80	17.08	5.28	4.00	21.08
Machinery	12.40	13.57	10.74	9.57	23.14
Transport equipment	11.60	12.70	5.07	3.97	16.67
Wood and furniture	37.80	38.34	1.03	0.49	38.83
Other manufactures	35.10	47.97	15.89	3.02	50.99
Petroleum and coal products	0.24	2.14	3.50	1.60	3.74

Notes: 1. The variables 1, IL and BL are estimated by means of equations (2), (5) and (4), respectively.

2. The variables $\hat{1}$ and $\hat{IL}$ are measured by means of equations (7) and (6), respectively.

Table 4. Industry shares of export manufacturing employment and trade in manufactures, 1976/1977
(Percentages)

Industry	Industry share of total employment required to produce exports: All industries	Industry share of total employment required to produce exports: Excluding tea and jute textile industries	Industry share of total manufactured exports
Tea	6.137	--	8.844
Sugar	0.019	0.235	0.071
Edible oils and fats	0.015	0.192	--
Tobacco	--	0.0036	0.006
Other food	0.004	0.05	0.014
Cotton textiles	0.276	3.46	0.097
Jute textiles	85.886	--	70.452
Paper	0.476	5.95	0.597
Leather	1.427	17.89	13.641
Fertilizer	0.181	2.26	0.057
Pharmaceuticals	--	--	--
Other chemicals	1.33	16.67	0.499
Cement	0.002	0.02	--
Basic metals	0.102	1.28	--
Metal products	0.303	3.80	0.009
Machinery	0.843	10.57	0.098
Transport equipment	0.059	0.74	0.279
Wood and furniture	0.363	4.55	0.030
Other manufactures	2.340	29.20	1.841
Petroleum and coal products	0.249	3.12	3.512

Table 5. Correlation coefficients of total labour absorption (BL), 1976/1977 to 1978/1979

Year	Industries' share of employment required to produce exports	Industries' share of exports
1976/1977	0.61 (3.27)	0.56 (2.87)
1977/1978	0.62 (3.35)	0.58 (3.02)
1978/1979	0.61 (3.27)	0.54 (2.72)

Note: Figures within parenthesis are t-statistics. They are significant at the 1 per cent level of significance.

The number of observations in each case is 20.

2. Unskilled labour absorption

The estimated unskilled labour requirements, calculated by means of equations (9) to (14), are presented in table 6. The rank orders of manufacturing sectors by unskilled labour absorption are not different from those measured for total labour absorption. The rank correlation coefficient between them is r = 0.94, which means that the sectors that have more total labour absorption employ more unskilled labour. The Spearman rank correlation coefficient between direct unskilled labour requirements (l^U) and indirect unskilled labour requirements (IL^U) is 0.45 (t = 2.14). But the rank correlation coefficient between direct unskilled labour requirements (l^U) and indirect unskilled labour requirements ($\hat{IL}^U$) estimated by means of the other method is 0.06.

Table 6 presents the industry shares of total unskilled labour required to produce goods equivalent to the value of exports in 1976/1977. Once again, strong similarity is found between absorption of total labour and the unskilled labour share in the exports of each industry. The coefficient of correlation between total unskilled labour requirements (L^U) and the industry's share of unskilled employment generated due to exports is positive (r = 0.65). Again, when the direct plus indirect unskilled labour requirements are correlated with the industry's share of total exports, the result is r = 0.61. It appears to confirm that Bangladeshi exports absorb more unskilled labour. Similar results are also observed for the years 1977/1978 and 1978/1979 using labour coefficients and the input-output table of 1976/1977 (table 7).

Table 6. Unskilled labour required by industries in 1976/1977

Industry	Unskilled labour in man-years per million taka of output or final demand					Industry share of total unskilled labour required to produce the value of exports (percentage)
	Direct		Indirect		Total	
	l^U	$\hat{l}^U$	IL^U	$\hat{IL}^U$	L^U	
Tea	30.54	30.6	3.65	3.55	34.19	5.644
Sugar	8.05	8.1	1.14	1.14	9.19	0.012
Edible oils and fats	4.16	4.2	0.69	0.69	4.85	0.013
Tobacco	2.14	2.1	2.59	2.59	4.73	--
Other food	8.41	8.5	2.22	2.15	10.63	0.003
Cotton textiles	30.68	43.8	17.23	4.08	47.91	0.276
Jute textiles	43.51	59.5	17.43	1.40	60.94	87.397
Paper	13.17	14.6	5.91	4.46	19.08	0.367
Leather	3.68	4.3	2.99	2.37	6.67	1.221
Fertilizer	4.34	4.3	7.24	7.24	11.58	0.140
Pharmaceuticals	6.75	7.3	11.49	10.95	18.24	--
Other chemicals	17.21	20.1	5.58	2.66	22.79	1.255
Cement	2.01	3.1	5.82	4.78	7.83	0.002
Basic metals	2.95	5.0	4.77	2.76	7.72	0.083
Metal products	13.20	14.3	4.02	2.95	17.22	0.294
Machinery	8.64	9.5	8.20	7.38	16.84	0.683
Transport equipment	8.19	9.0	3.77	2.99	11.96	0.049
Wood	29.24	29.7	0.79	0.38	30.03	0.326
Other manufactures	26.94	32.2	12.49	7.21	39.43	[illegible]
Petroleum and coal products	0.13	1.16	2.28	1.25	2.41	0.157

Note: l^U, IL^U, $\hat{l}^U$, $\hat{IL}^U$ and L^U are measured by means of equations (9) to (14).

Table 7. Correlation coefficients of total unskilled labour absorption, 1976/1977 to 1978/1979

Year	Industries' share of employment required to produce exports	Industries' share of exports
1976/1977	0.65	0.61
	(3.62)	(3.26)
1977/1978	0.656	0.624
	(3.69)	(3.39)
1978/1979	0.65	0.583
	(3.62)	(3.04)

Note: Figures within brackets are t-statistics. They are significant at the 1 per cent level of significance.

The number of observations in each case is 20.

3. Impact of foreign trade on employment

Table 8 presents the aggregate impact of foreign trade on the level of employment for the years 1976/1977 to 1978/1979. The direct labour coefficients of 1976/1977 and the input-output table of 1976/1977 are used to calculate the total effect of trade on employment for these three years. It is interesting to see that N^n is far greater than one for the periods considered. This result shows that the structure of Bangladesh foreign trade is such that exported manufactures are more labour-intensive than imported ones. The quantitative difference was as high as 162 per cent in 1976/1977 for unskilled labour. The labour requirements of exports are consistently greater than those of imports in all the years considered. It would not be incorrect to conclude that the structure of foreign trade increased the level of employment in 1976/1977.

Table 8. Aggregate impact of trade on employment, 1976/1977 to 1978/1979
(Values of N^n)

Year	All labour	Unskilled labour
1976/1977	2.34	2.62
	(2.71)	(3.03)
1977/1978	2.85	3.22
1978/1979	2.49	2.80
Simple average	2.56	2.88

Notes: N^n is estimated by means of equation (15). Figures within parentheses are also values of N^n, with import values at c.i.f. prices. Import values in all other cases are at market prices.

4. Factor intensity and the H-O-S theorem

Estimates of ϕ (an index of the capital-labour ratio in exports versus imports) have been made using the same source of data. The result appears in table 9. Since ϕ is less than one, in 1976/1977 the exports of manufactures from Bangladesh were labour-intensive in relation to imports. This finding shows that the pattern of foreign trade of manufactures follows what the H-O-S model would predict in spite of its limitations. It should be noted that ϕ is a parameter that may change over a period of time because comparative advantage changes over time. It would be useful if the time series of ϕ, which reflects the structural behaviour of foreign trade of a country, could be examined. But in the present case, the value of ϕ has been estimated using the technical coefficient matrix of 1976/1977 over the years 1977/1978 and 1978/1979. It is difficult to draw any inference from the yearly fluctuations, given the limitations in the methodology and the data employed in the analysis.

Table 9. Factor content of foreign trade, 1976/1977 to 1978/1979

Year	All labour		Unskilled labour	
	ϕ_1	ϕ_2	ϕ_1	ϕ_2
1976/1977	0.282	0.196	0.251	0.175
1977/1978	0.208	..	0.185	..
1978/1979	0.258	..	0.230	..

Notes: All values of ϕ are indices of capital-labour ratios in exports versus imports and are estimated by means of equation (20).

ϕ_1 and ϕ_2 are computed using imports at market and c.i.f. values respectively.

All the export values are in f.o.b. prices.

5. Factor intensity using fixed capital investment-output ratios and the H-O-S theorem

In order to examine factor intensity embodied in exports relative to imports, the value of ϕ has been estimated by means of equations (18) to (20), using fixed capital investment coefficients. The results are presented in table 10. As in table 9, ϕ is less than one, which means that exports of manufactures from Bangladesh are labour-intensive relative to imports.

Table 10. Factor content of foreign trade using fixed capital-output ratios, 1976/1977 to 1978/1979

Year	All labour		Unskilled labour	
	ϕ_1	ϕ_2	ϕ_1	ϕ_2
1976/1977	0.590	0.516	0.527	0.461
1977/1978	0 51	..	.456	..
1978/1979	0.568	..	.507	..

Notes: All values of ϕ are indices of capital-labour ratios in exports versus imports and are estimated by means of equation (20).

ϕ_1 and ϕ_2 are computed using imports at market and c.i.f. values respectively.

All the export values are in f.o.b. prices.

D. Concluding remarks

Industrial export expansion is advocated by policy-makers and social scientists to increase labour absorption in developing countries. The results of this study support such a view.

It is important to point out some of the drawbacks in the light of which the findings and inferences drawn in this paper should be read. First, the adoption of the input-output analysis imposes a number of well-known limitations, such as that of ignoring the problem of the choice of techniques, in addition to the assumptions relating to factor prices, technical progress etc., which determine the technical input coefficients during the period under study. Secondly, intermediate inputs used in the input-output system include both domestically produced and imported inputs. In the extreme case, it might be conceivable that there would be no employment creation if all intermediate inputs are imported inputs. The scattered evidence* tends to suggest that the conclusions reached in this paper might not be affected in spite of this theoretical possibility.

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*In an analysis of 1970 data for the Republic of Korea, L. P. Jones ([24], p. 332) observed that the Spearman rank correlation coefficients between total labour requirements employing two Leontief inverse matrices $(I-A_d)^{-1}$ and $(I-A)^{-1}$ were, respectively, 0.77 for 18 industries and 0.61 for 340 industries. $(I-A_d)^{-1}$ was measured using domestically produced intermediate inputs, while $(I-A)^{-1}$ was measured using intermediate inputs that included both domestically produced and imported inputs.

The input-output data of 1976/1977 for the economy of Bangladesh have been used in this empirical analysis. The results can best be seen as illustrating the points discussed. The findings are important from the point of view of the employment problem in Bangladesh. The analysis indicates that the promotion of manufactured exports helps to generate higher levels of employment. The commodity composition of trade between capital-intensive and labour-intensive goods has not been reversed in Brazil, Chile, Colombia, Côte d'Ivoire, Indonesia, Pakistan, Republic of Korea, Thailand, Tunisia and Uruguay, as shown by the results of individual country studies ([13], p. 13).

Industries such as those of jute textiles, tea and leather are found to be export-oriented, and together with the sugar industry absorbed approximately 70 per cent of total manufacturing employment in 1976/1977. Manufacturing export expansion is a force in providing employment for a small economy like that of Bangladesh.

The findings of this paper reveal that labour absorption through the production of manufactured exports is positively and significantly related to the absorption of labour per unit of output, in other words, Bangladeshi exports are labour-absorbing.

In the Mexican economy for 1970, S. Levy ([15], tables 1 and 2) compared the two values of total labour requirements per unit of output and the two values of total factor intensities (capital-labour ratios), using both Leontief inverse matrices $(I-A_d)^{-1}$ and $(I-A)^{-1}$ for 59 industries. There was very little difference between the two indices of total labour requirements. The two indices of total factor intensities were almost identical. The basic reason for this result was that total imports were a small percentage of GDP in Mexico for that year (the ratio of imports to GDP was 0.065).

The ratio of imports to GDP for the year 1976/1977 in the economy of Bangladesh was 0.1284 ([3], table 2.4). This might partly explain the extent to which imports are affected by the employment impact of manufactured exports.

Annex

SOURCES OF DATA

The data used in this study came from different sources, the main ones being listed below:

(a) The detailed report on the Census of Manufacturing Industries of Bangladesh for 1976/1977, published in September 1981 by the Bangladesh Bureau of Statistics. The year 1976/1977 is considered as a period of comparatively normal economic conditions;

(b) The 1976/1977 input-output table for the economy of Bangladesh. The input-output table constructed by the planning commission is also based on the Census of Manufacturing Industries for 1976/1977. The input flows include both imported and domestically produced imported inputs. The A matrix of technical coefficients of this input-output table has been used, since it is the latest available input-output table for the Bangladesh economy.

The original table constructed for the second five-year plan, 1980-1985, consisted of 47 industries [23]. Twenty industries are used in the analysis contained in this study, since other industries are classified as agriculture, construction and service industries. The category of "other manufacturing industries" includes optical goods, plastic products, pens and pencils, ice, clay products, glass products, potteries, bricks and concrete products, umbrellas, rubber products, ready-made garments, printing and publishing, thread and narrow fabrics industries;

(c) The values of exports and imports of Bangladesh in current prices for the years 1976/1977, 1977/1978 and 1978/1979 have been collected from [4], [5], [6] and [17]. The figures have been regrouped according to the input-output industry classification.

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INPUT-OUTPUT VERSUS SOCIAL ACCOUNTING IN THE MACRO-ANALYSIS OF DEVELOPMENT POLICY

S.I. Cohen*

Introduction

The role of social accounting matrices (SAMs) is often primarily seen as that of a helpful tool in the setting-up and estimation of corresponding models. In an overview of modelling and social accounting matrices Thorbecke [11] concludes that the advantage of forcing a model into a social accounting framework is that one can discover inconsistencies of which the authors were not even aware. The discipline of building an explicit SAM assures that the initial values of the variables in the system are internally consistent. There is a second role which a SAM can play, however. By appropriate manipulations the table can be rearranged so as to give sets of exogeneous variables and a coefficient matrix that can be subjected to a useful multiplier analysis.

Most of the empirical literature on SAM has been concerned more with its first use as a data framework than with its second use for multiplier analysis. The literature has particularly dealt with construction of data systems for some thirty developing countries, for a few of these counterpart models were developed.** In contrast, the published multiplier analysis of social accounting matrices is limited to a much smaller number of developing countries.***

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**For an inventory of most of the available SAMs, see Pyatt and Round [8]. This paper supplements the list with four more SAMs.

***See Hayden and Round [6] for Botswana, Cohen and Jellema [4] for Colombia, Defourny and Thorbecke [5] for the Republic of Korea and Pyatt and Roe [7] for Sri Lanka.

The purpose of this paper is to examine the use of SAM as a solid framework for conducting international comparisons on the structure of socio-economic systems of different countries. In particular, an analysis of multipliers across countries should show meaningful, significant and stable results. Section A deals with the construction and content of social accounting matrices for four countries, namely Colombia for 1970, Pakistan for 1979, the Republic of Korea for 1975 and Suriname for 1979, which were constructed by the author in collaboration with several associates. Section B presents the case for considering the SAM as a model of analysis in its own right, and expresses the steps in deriving the multipliers of the SAM and their decomposition into transfer, open loop and closed-loop effects. Section C applies the multiplier analysis to the wants factor and institutional accounts of the SAM. Section D evaluates the multipliers of production activities in the four SAMs and compares them with those obtained from the narrower framework of the input-output matrix. Section E draws conclusions on the comparative analysis of the structural properties of the SAMs of the four countries.

A. Social accounting matrices of Colombia, Pakistan, the Republic of Korea and Suriname

For obvious reasons greater analytical insight is gained if basically comparable social accounting matrices are constructed for the individual countries. Table 1 gives the SAM for Colombia, which is meant to serve as a standard example. Although this SAM has been closely followed in the applications to Pakistan, the Republic of Korea and Suriname, certain modifications in the classifications for the latter countries were unavoidable.

Social accounting matrices are compiled according to the same accounting principles as input-output tables, each transaction being recorded twice so that any ingoing in one account must be balanced by an outgoing of another account. In contrast, SAM contains a complete list of transactions describing income, expenditure and production flows. These transactions are grouped into different sets of accounts as indicated below:

(a) Wants account;

(b) Factors of production account;

(c) Institutions current account, which can be further disaggregated by type of institution into:

(i) Households account;

(ii) Firms acount;

(iii) Government account;

(d) Institutions capital account;

(e) Activities account;

(f) Rest of the world account.

(Millions of Colombian pesos)

	Item	Wants accounts 1	2	3	4	5	6	Factor accounts 7	8	9
1.	Food	..	..	..	..	..	..	..	..	..
2.	Non-food	..	..	..	..	..	..	..	..	..
3.	Housing	..	..	..	..	..	..	..	..	..
4.	Health	..	..	..	..	..	..	..	..	..
5.	Education	..	..	..	..	..	..	..	..	..
6.	Other social services	..	..	..	..	..	..	..	..	..
7.	Urban labour income	..	..	..	..	..	..	..	..	..
8.	Rural labour income	..	..	..	..	..	..	..	..	..
9.	Gross profits	..	..	..	..	..	..	..	..	..
10.	Urban salary-earners	..	..	..	..	..	..	13 259.4	..	16 625.7
11.	Urban wage-earners	..	..	..	..	..	..	6 866.2	..	..
12.	Urban employers	..	..	..	..	..	..	1 392.4	..	2 694.9
13.	Urban self-employed	..	..	..	..	..	..	9 304.8	..	16 419.1
14.	Urban family helpers	..	..	..	..	..	..	4 528.7	..	6 502.3
15.	Rural salary-earners	..	..	..	..	..	..	..	1 208.7	958.1
16.	Rural wage-earners	..	..	..	..	..	..	..	5 526.7	..
17.	Rural employers	..	..	..	..	..	..	..	481.0	1 178.5
18.	Rural self-employed	..	..	..	..	..	..	..	5 486.4	4 304.2
19.	Rural family helpers	..	..	..	..	..	..	..	1 271.1	822.3
20.	Firms	..	..	..	..	..	..	..	..	15 492.4
21.	Government	..	..	..	..	..	..	..	..	1 882.2
22.	Aggregate capital account	..	..	..	..	..	..	..	..	..
23.	Agriculture	13 661.6	23.5	425.3	..	..	148.5	..	..	..
24.	Mining	..	3.7	67.9	..	..	54.4	..	..	..
25.	Coffee	853.7	..	..	..	..	..	..	..	..
26.	Industry	29 885.2	12 034.2	43.0	1 064.2	..	1 628.1	..	..	..
27.	Electricity, gas and water	..	..	..	..	..	934.1	..	..	..
28.	Modern services	..	751.6	13 626.8	..	..	3 378.5	..	..	..
29.	Personal services	..	7 739.5	..	1 944.3	3 632.0	1 207.6	..	..	..
30.	Government services	73.8	394.5	68.4	69.0	99.3	90.7	..	..	..
31.	Indirect taxes	..	..	..	..	..	..	..	..	..
32.	Import duties	..	..	..	..	..	..	..	..	..
33.	Rest of the world	..	..	..	..	..	..	..	..	..
34.	Totals	44 434.3	20 947.0	14 231.4	3 077.5	3 731.3	7 441.8	35 351.5	13 973.9	66 879.7

continued

Table 1 (continued)

Item	Institutions current accounts											
	10	11	12	13	14	15	16	17	18	19	20	21
1. Food	11 280.4	3 461.9	1 140.6	10 680.1	4 822.2	1 036.6	3 830.6	609.2	6 061.0	1 556.7	..	..
2. Non-food	6 433.6	1 623.9	779.1	5 443.9	2 240.2	472.8	1 172.1	229.9	2 156.1	395.5	..	..
3. Housing	4 837.8	953.8	567.6	3 865.8	2 456.4	170.8	353.8	96.3	730.7	198.6	..	..
4. Health	745.9	304.6	177.5	682.5	426.5	59.6	171.5	46.6	378.5	84.4	..	..
5. Education	1 387.8	237.9	223.2	1 121.8	366.6	64.1	89.5	29.6	186.1	24.6	..	..
6. Other social services	2 542.6	298.5	711.2	2 169.5	751.4	169.0	225.9	172.5	299.6	101.6	..	..
7. Urban labour income	..	..	..	..	..	..	..	..	..		..	..
8. Rural labour income	..	..	..	..	..	..	..	..	..		..	..
9. Gross profits	..	..	..	..	..	..	..	..	..		..	..
10. Urban salary-earners	..	..	..	..	..	..	..	..	..		..	335.0
11. Urban wage-earners	..	..	..	..	..	..	..	..	..		..	35.1
12. Urban employers	..	..	..	..	..	..	..	..	..		..	15.0
13. Urban self-employed	..	..	..	..	..	..	..	..	..		..	161.6
14. Urban family helpers	..	..	..	..	..	..	..	..	..		..	1 629.7
15. Rural salary-earners	..	..	..	..	..	..	..	..	..		..	22.1
16. Rural wage-earners	..	..	..	..	..	..	..	..	..		..	37.9
17. Rural employers	..	..	..	..	..	..	..	..	..		..	25.4
18. Rural self-employed	..	..	..	..	..	..	..	..	..		..	69.9
19. Rural family helpers	..	..	..	..	..	..	..	..	..		..	307.0
20. Firms	..	..	..	..	..	..	..	..	..		..	1 284.0
21. Government	1 767.9	148.3	490.8	1 317.2	642.4	64.0	63.9	262.4	274.3	148.3	3 248.5	..
22. Aggregate capital account	1 130.2	-109.3	20.1	583.3	856.7	136.8	-328.1	210.5	-154.6	-102.8	13 527.9	7 660.8
23. Agriculture	..	..	..	..	..	..	..	..	..		..	..
24. Mining	..	..	..	..	..	..	..	..	..		..	..
25. Coffee	..	..	..	..	..	..	..	..	..		..	..
26. Industry	..	..	..	..	..	..	..	..	..		..	..
27. Electricity, gas and water	..	..	..	..	..	..	..	..	..		..	..
28. Modern services	..	..	..	..	..	..	..	..	..		..	..
29. Personal services	..	..	..	..	..	..	..	..	..		..	9 961.6
30. Government services	..	..	..	..	..	..	..	..	..		..	..
31. Indirect taxes	..	..	..	..	..	..	..	..	..		..	..
32. Import duties	..	..	..	..	..	..	..	..	..		..	58.9
33. Rest of the world	173.7	..	3.1	89.5	131.6	20.9	..	32.4	..	..	..	21 604.1

	Item	Capital account	Activities account								Indirect taxes		Rest of the world	Totals
		22	23	24	25	26	27	28	29	30	31	32	33	34
1	Food	..	..	..	..	..	..	..	..	..	..	..	..	44 434.3
2	Non food	..	..	..	..	..	..	..	..	..	..	..	..	20 947.0
3	Housing	..	..	..	..	..	..	..	..	..	..	..	..	14 231.4
4	Health	..	..	..	..	..	..	..	..	..	..	..	..	3 077.5
5	Education	..	..	..	..	..	..	..	..	..	..	..	..	3 741.3
6	Other social services	..	..	..	..	..	..	..	..	..	..	..	..	7 441.0
7	Urban labour income	..	..	..	..	..	..	..	..	6 897.1	..	..	..	35 351.5
8	Rural labour income	..	..	..	..	..	..	..	..	1 386.4	..	..	..	13 973.9
9	Gross profits	..	..	..	..	..	..	..	..	..	..	..	-3 591.9	66 879.7
10	Urban salary earners	..	..	..	..	..	..	..	..	..	..	..	79.5	30 299.7
11	Urban wage earners	..	..	..	..	..	..	..	..	..	..	..	18.2	6 919.5
12	Urban employers	..	..	..	..	..	..	..	..	..	..	..	10.8	4 113.2
13	Urban self employed	..	..	..	..	..	..	..	..	..	..	..	68.1	25 533.6
14	Urban family helpers	..	..	..	..	..	..	..	..	..	..	..	33.3	12 694.0
15	Rural salary earners	..	..	..	..	..	..	..	..	..	..	..	5.8	2 196.6
16	Rural wage earners	..	..	..	..	..	..	..	..	..	..	..	14.6	5 579.2
17	Rural employers	..	..	..	..	..	..	..	..	..	..	..	4.4	1 689.6
18	Rural self-employed	..	..	..	..	..	..	..	..	..	..	..	26.0	9 886.6
19	Rural family helpers	..	..	..	..	..	..	..	..	..	..	..	6.3	2 406.8
20	Firms	..	..	..	..	..	..	..	..	..	..	..	..	16 776.4
21	Government	..	..	..	..	..	..	..	..	..	7 271.9	3 292.7	729.4	21 604.1
22	Aggregate capital account	..	..	..	..	..	..	..	..	..	..	..	5 229.4	28 660.3
23	Agriculture	2 636.0	726.5	22.8	5 908.5	15 041.5	3.6	412.8	701.3	249.8	..	..	2 321.5	42 281.7
24	Mining	55.1	18.1	43.9	3.1	1 826.4	35.7	173.7	4.6	5.6	..	..	1 393.4	3 686.0
25	Coffee	..	..	..	549.0	..	..	..	224.5	67.1	..	..	9 496.5	10 868.7
26	Industry	13 230.1	4 066.7	190.9	81.0	26 166.6	453.6	9 202.3	3 664.4	1 594.9	..	..	2 656.7	103 979.9
27	Electricity, gas and water	6.6	6.6	106.2	6.9	576.1	63.5	221.1	85.3	55.7	..	..	..	204.0
28	Modern services	12 633.4	3 573.2	725.6	576.2	18 371.7	112.1	12 214.4	233.2	668.3	..	..	2 912.2	69 727.0
29	Personal services	..	6.0	2.0	1.1	90.7	9.8	416.9	79.2	162.0	..	..	..	15 291.0
30	Government services	78.8	23.0	10.9	3.3	158.0	4.0	88.9	11.4	9.9	..	..	17.7	11 123.2
31	Indirect taxes	..	-230.6	346.3	3 072.2	3 486.7	11.7	1 169.0	113.0	9.6	..	..	..	7 271.9
32	Import duties	..	116.5	6.3	..	3 180.5	..	8.1	..	3.6	..	..	..	3 292.7
33	Rest of the World	..	910.3	43.4	..	16 851.3	..	2 714.3	87.0	33.2	..	..	..	21 149.8
34	Totals	28 660.3	42 281.2	3 686.0	10 868.7	103 979.9	204.0	69 797.0	15 291.0	11 123.2	7 271.9	3 292.7	21 149.8	..

The focus of attention of the disaggregations in the applications reported here lies with the household account. The disaggregation of households emphasizes dualities in the location of population (rural, urban), mode of earning (modern employment, self-employment, inactive) and occupational characteristics of worker (within modern employment a distinction is made between employers, non-manual workers and manual workers). As a result, the general rule was to distinguish five rural groups and five urban groups as the example in table 1 shows. The factor accounts were meant to be subdivided into capital and several types of labour, while the activities accounts were meant to be subdivided into eight to ten sectors at the one-digit level.*

The first set of accounts in table 1 is the wants account. It is not obligatory to include this account in the SAM. But, by incorporating the wants account, the present SAMs increase focus on a whole range of goods and services classified according to basic needs. Here they include food, housing, health, education and other goods and services. It is informative to know, for instance, how much expenditure on food products is taken up by specific household groups and how this expenditure is matched by agriculture and the non-agricultural sectors. This interest in itemizing the achieved consumption stems from the policy questions addressed by basic-need approaches and corresponding systems to model them.**

Rows 1 to 6 contain one large block of entries on the intersects with columns 10 to 19, giving the breakdown of consumption expenditure over the six wants categories and over the 10 household groups. The outgoings of the wants account, columns 1 to 6, are entered as incomings to the activities account, rows 23 to 30. This block of entries converts broad categories of consumption expenditure on food and other items into the more well-known sectoral classification. For example, column 1 contains the sectoral breakdown of food consumption: 30 per cent of food is produced directly by agriculture, 67 per cent of food is supplied by the food-processing industry.

The next set of accounts is the factor account, showing, for instance, that the largest part of urban labour income originates in the services sectors, while the largest source of rural labour income is agriculture.

In the institutions current account, household groups receive a mixture of labour and capital income. Firms and government receive capital income. Additional sources of income to households

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*Several exceptions in these classifications were unavoidable, as may be noted from the applications in table 3.

**An early attempt to model basic needs within a general equilibrium framework is found in Cohen ([2], [3]). The study, which contains applications to the Republic of Korea, includes time series tables that can be joined together to form a series of SAMs for the Republic of Korea.

are transfers from government and transfers from the rest of the world. The expenditures by the different institutions are directly readable from their respective rows.

In the institutions capital account, all savings of the institutions are entered in row 22 and columns 10 to 21. Furthermore, on the intersect with column 33 the balance-of-payments deficit provides the balance with gross investment demand, which is captured in column 22 and rows 23 to 30.

In the activities account, which represents the well known input-output structure, the different final demand categories are recorded by rows. The columns of the activities account, from top to bottom, show factor payments, intermediate costs, indirect taxes and import duties.

Finally comes the rest of the world account. Row 33 registers imports as if they are all complementary, while column 33 registers exports.

With regard to details of estimation and statistical sources, in all four SAMs, the official national accounts statistics were used as the building blocks of these statistical applications. This is necessary because national accounts statistics form the reference framework for national policy-making. Besides, extended modelling in a later phase will have to work with time series based on national accounts statistics. The above use of national accounts statistics implied rescaling statistics from other data sources to fit into these aggregates. In particular, there are three main types of other data sources concerned: the input-output table, the labour force survey and the household income and expenditure survey.

The first type of data used is the input-output table. In most applications it was necessary to apply the RAS-method to upgrade the available input-output table to the selected year of the SAM.

The data of the household income and expenditure survey, giving average values per type of earner, and labour force survey, giving the numbers of corresponding earners, were combined and used to fill the inner structure of the cross-accounts of households and factors and households and wants, after rescaling to fit the national accounts aggregates. In filling the incomings in the household account it was necessary to keep at zero the receipts of households from other households, and to assume that household receipts from the rest of the world are distributed on household types in proportion to each household group income. These assumptions reflect the general lack of data on income transfers between household groups.

As for the outgoings, the household income and expenditure survey together with the labour force survey provided the required data to fill consumption expenditure and direct taxes on household groups, after rescaling to fit the national accounts aggregates.

The difference between income and expenditure for each household group constitutes the entry in the capital account. Furthermore, groups with negative residuals, in other words, dissavings, were assumed to incur no outgoings to the rest of the world. Outgoings were proportionately distributed among households with positive residuals, or savings, on the basis of their income.

Finally, the submatrix that converts private consumption categories belonging to the wants account to final demand categories belonging to the activities account has been made consistent by applying the RAS-method to a converter matrix obtained from various sources and the already-found column and row totals of private consumption and final demand categories.

The SAM of Pakistan differs in two important respects from those of the other countries. First, the available input-output table for Pakistan imposed registering all imports as competitive.* Secondly, household surveys and other income data in Pakistan do not allow an explicit specification of the factor accounts, so that institutional income had to be mapped directly to the activity accounts.**

B. The social accounting matrix as a model of analysis

Compared to the Leontief input-output model, SAM is a broadening of focus in development thinking. It is important to resolve this question before elaborating on algebraic derivations.

For a long time much of the national planning of producton and investment has been conducted within the narrow framework of the Leontief input-output model, thus dealing primarily with intersectoral delivery, to the exclusion of other significant mechanisms in the economy such as those of factor remuneration, income transfers and expenditures by participating actors and their recycling back to sectoral activity. The same bias is true of the studies on the intersectoral impact of international trade. Needless to say, other things remaining the same, economic policy based on intersectoral accounts is inferior to that based on intersectoral, income, transfer and expenditure accounts.

The other argument in favour of working with the SAM is obvious. It is increasingly required by policy-makers, many

*As a result of the absence of leakage through imports in the application to Pakistan, the impact multipliers are bound to be over estimated in Pakistan as compared with other countries.

**This, by itself, is not a handicap. For conducting the multiplier analysis a factor account with the same subdivisions as the institution account is attached to the SAM. Activity receipts by institution are allocated to its corresponding factor as ingoings, and reallocated again from the factor concerned to the corresponding institution as outgoings.

economists and the larger public, in developing and developed countries alike, to appraise, besides the production objective, other development objectives pertaining to income policy and the allotment of basic provisions and obligations among population groups.

In spite of the above compelling arguments, the use of SAMs for economic analysis is not frequent. This could be a matter of time. However, other arguments can be raised against SAM, such as the static nature of the economic analysis obtainable from assuming constant coefficients or the sometimes arbitrary classifications, unreliabilities and obsolescence imposed by the timing and the kind of data that go into the construction of SAMs.

However, all these limitations apply also to input-output in a greater or lesser degree. Constant coefficients may be more objectionable in a SAM, but they can be minimized by appropriate classifications.

In the context of a comparative analysis of the structural properties of different socio-economic systems, which is the focus of this paper, SAM is an appropriate framework for comparison in ways similar to comparative structural analysis of input-output tables.* In the context of comparative analysis the constancy of the coefficients can be an advantage. Impact multipliers based on constant coefficients obtainable from inverted input-output or social accounting tables can have the advantage of being more country-neutral in cross-country comparisons, in contrast to flexible models that involve non-uniformities in their treatment of individual case-studies.

With regard to algebraic derivations in the input-output analysis, an endogenous vector of sectoral production, p, can be predicted from a matrix of input-output coefficients, A, and a vector of exogenous final demand, f, as in equation 1.

$$p = Ap + f = (I-A)^{-1} f \qquad (1)$$

SAM can be used similarly.

Several steps are required to transform SAM into a predictive model along the lines of the input-output matrix. First, the accounts of SAM need to be subdivided into endogenous and exogenous categories and regrouped so that the exogenous accounts would fall to the right and at the bottom of the endogenous accounts.

Following an established convention, which provides a suitable basis for comparing the underlying structures of different socio-economic systems, the endogenous accounts would include the following four categories, with rows and columns, as detailed in table 1:

1. Wants (rows and columns 1 to 6)

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*See Chenery and Watanabe [1].

2. Factor incomes (rows and columns 7 to 9)

3. Households and firms (rows and columns 10 to 20)

4. Production activities (rows and columns 23 to 30)

These endogenous accounts form a 28 x 28 submatrix within the regrouped SAM, containing all the flows from and to endogenous accounts.

The outgoings of other accounts constitute a 28 x 5 submatrix to the right, containing flows of sectoral export and investment demand and income transfers from the rest of the world and government. These are exogenous outgoings and can be summed into one exogenous vector.

To the bottom of the endogenous accounts is a submatrix that contains the outgoings of the endogenous accounts into the other accounts, that is, imports, taxes and savings. These residual balances need not be treated further here.

Secondly, the flows in the endogenous accounts need to be expressed as average propensities of their corresponding column totals. Thus each flow in the 28 x 28 matrix is divided by its respective column total to give the matrix of average propensities, denoted by A.

As a result of the above manipulations the SAM takes the form of table 2 (also see annex). Note that the A matrix appears in a partitioned form to facilitate a decomposition of the multipliers. The vector of row totals y represents the endogenous variables, while the vector x represents the exogenous variables.

The vector of endogenous variables y can now be solved from equation 2.

$$y = Ay + x = (I-A)^{-1}x = M_a x \qquad (2)$$

where M_a is the aggregate multiplier matrix which can be subjected to a standard reduced form analysis as is commonly done with input-output tables.

Furthermore, the aggregate multiplier matrix can be decomposed into three multiplier matrices M_1, M_2 and M_3, as in equation 3 below. M_1, which is known as the transfer multiplier, captures effects resulting from direct transfers within endogenous accounts (for example, between production activities). The open-loop effects, M_2, capture the interactions among and between the endogenous accounts (from production activities to factors, institutions and wants). The closed-loop effects, M_3, ensure that the circular flow of income is completed among endogenous accounts (from production activities to factors to institutions to wants and then back to activities in the form of consumption demand).

$$y = Ay + x = (I-A)^{-1}x = M_a x = M_3 M_2 M_1 x \qquad (3)$$

Table 2. The social accounting matrix in the form of $y = Ay + x$

Expenditures / Receipts	Endogenous accounts				Exogenous accounts	Totals
	1. Wants	2. Factors	3. Institutions	4. Activities	Government, capital and rest of the world	
Endogenous						
1. Wants			A_{13}		X_1	Y_1
2. Factors				A_{24}	X_2	Y_2
3. Institutions		A_{32}	A_{33}		X_3	Y_3
4. Activities	A_{41}			A_{44}	X_4	Y_4
Exogenous						
Others	Residual balance					
Totals	Y_1	Y_2	Y_3	Y_4		

The formal derivation of the decomposed multipliers proceeds by separating matrix $\tilde{A}$ from A, provided that $\tilde{A}$ is of the same size as A and that $(I - \tilde{A})^{-1}$ exists.

$$y = Ay + x$$

$$= (A-\tilde{A})\, y + \tilde{A}y + x$$

$$= (I-\tilde{A})^{-1} (A-\tilde{A})\, y + (I-\tilde{A})^{-1} x$$

$$= A^{*}y + (I-\tilde{A})^{-1} x \qquad (4)$$

Here, $(I-\tilde{A})^{-1}$ refers to the transfer multiplier, M_1. Derivation of of M_2 and M_3 proceeds further as in equations (5) to (7).

Both sides of equation 4 can be multiplied by A^{*}, substituting for $A^{*}y$ from equation 4, and rearranging terms to give:

$$y = A^{*2}y + (I+A^{*})\, (I-\tilde{A})^{-1} x \qquad (5)$$

The same manipulation can be repeated with A^{*2} up to A^{*k}, so that in general:

$$y = A^{*k}y + (I+A^{*}+A^{*2} + \ldots + A^{*(k-1)})\, (I-\tilde{A})^{-1} x \qquad (6)$$

For any positive value for k it is true then that:

$$y = (I-A^{*k})^{-1}\, (I+A^{*}+A^{*2} + \ldots + A^{*(k-1)})\, (I-\tilde{A})^{-1} x \qquad (7)$$

Here then, $(I-A^{*k})^{-1}$ is identified with M_3, $(I+A^{*}+A^{*2} + \ldots + A^{*(k-1)})$ is identified with M_2 and, as was just mentioned, $(I-\tilde{A})^{-1}$ refers to M_1. The multipliers can also be rearranged in an additive form.*

C. A selection of aggregate multipliers and their decomposition

It is recalled that the aggregate multiplier matrix M_a is decomposable into three multiplier matrices

$$M_a = M_3\, M_2\, M_1 \qquad (8)$$

Because the multiplier matrices can be extensive (for Colombia they count 28 x 28), it is instructive to limit the presentation here to the impact of exogeneously specified injections (changes) into sectoral activities on the variables of the wants, factors, institutions and activities accounts, and in particular the latter two.

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*The multiplicative decomposition can be rearranged, as done by Stone [9], into four additive components, namely, the initial injection I and the net contributions of the transfer effect T, open-loop effect O and closed-loop effect C, as follows:

$$M_a = I + (M_1-I) + (M_2-I)M_1 + (M_3-I)M_2M_1$$

$$= I + T + O + C$$

Table 3 accordingly gives the relevant aggregate multipliers within M_a. Specifically, they fall into four compartments: $M_{a,14}$, $M_{a,24}$, $M_{a,34}$ and $M_{a,44}$ corresponding respectively to the impacts on wants (subindex 1, table 2), factors (subindex 2), institutions (subindex 3) and activities (subindex 4) as a result of injections into activities (subindex 4). The first, second and third compartments will be dealt with in this section, and the fourth compartment in the next.

In general, it can be seen that the magnitude of the multipliers are smallest for Suriname, followed by the Republic of Korea and Colombia. The case of Pakistan, which shows the highest multipliers, is not strictly comparable because the SAM of Pakistan does not consider leakage through imports explicitly. However, the general validity and the general comparability of the relative distribution of the impact multipliers for Pakistan need not be disturbed by this difference in registration.

In the first compartment, which gives the impact of allocations to activities on the wants account, it is striking to note the relatively high impact of services on food (table 3, row 1). In Colombia, the Republic of Korea and Suriname this impact surpasses that of agriculture on food. Pakistan, with a higher share of non-marketed and non-processed food, shows the opposite. The dominating impact of services, as compared with other sectors, is generally established for other wants categories as well. In terms of impact, the consumption of food is followed by that of other goods, housing, education and health, reflecting their decreasing shares in consumption expenditure. The main exceptions are in the relative positions of education and health, which are reversed in the cases of Pakistan (known for its very low expenditure on education) and Suriname (possibly as a result of its particularly high provisions for health).

In the second compartment, which relates to the impact of allocations on the factor accounts, it is found that, on a row-by-row basis, labour income is highly affected by expansion in service activities. Other sectors with significant effects are mining and agriculture. Capital income is mostly affected by expansion in agricultural activity, followed by mining and services. In column terms, the results show the multiplier ratio of labour income to capital income in Colombia to be highest in government services and lowest in electricity and agriculture, which are capital-intensive and land-extensive, respectively. The Republic of Korea gives different results. The multiplier ratio of labour income to capital income is highest in mining, and lowest in agriculture. In both countries, industry takes an intermediate position, with the multiplier ratio of labour income to capital income varying between 0.6 for Colombia and 0.5 for the Republic of Korea. The classification and computation of the factor accounts for Suriname is not strictly comparable with the other countries, while for Pakistan, as was footnoted earlier, the factor and institutions accounts are collapsed together.

Table 3. SAM aggregate multipliers by type of activity for four countries

Country and item	21	22	23	24	25	26	27	28
Colombia								
1. Food	0.8808	0.9411	0.6124	0.6252	0.8688	0.8059	0.8700	1.0221
2. Non-food	0.4077	0.4460	0.2852	0.2962	0.4173	0.3855	0.4141	0.4846
3. Housing	0.2696	0.3022	0.1893	0.2004	0.2869	0.2639	0.2816	0.3275
4. Health	0.0597	0.0650	0.0417	0.0432	0.0608	0.0561	0.0605	0.0712
5. Education	0.0712	0.0802	0.0502	0.0531	0.0760	0.0700	0.0746	0.0865
6. Other social services	0.1437	0.1608	0.1011	0.1061	0.1510	0.1396	0.1482	0.1701
7. Urban labour income	0.4983	0.625	0.3634	0.4678	0.7529	0.6200	0.7571	1.1372
8. Rural labour income	0.3474	0.2783	0.2262	0.1908	0.2177	0.2109	0.2549	0.3384
9. Gross profits	1.5329	1.7075	1.0747	1.0505	1.4194	1.4032	1.3411	1.1634
10. Urban salary-earners	0.5680	0.6583	0.4035	0.4366	0.6352	0.5814	0.6173	0.7157
11. Urban wage-earners	0.0968	0.1211	0.0706	0.0909	0.1452	0.1204	0.1470	0.2209
12. Urban employers	0.0814	0.0934	0.0576	0.0608	0.0868	0.0810	0.0839	0.0917
13. Urban self-employed	0.5075	0.5833	0.3595	0.3810	0.5466	0.5077	0.5285	0.5849
14. Urban family helpers	0.2129	0.2459	0.1510	0.1621	0.2344	0.2159	0.2274	0.2588
15. Rural salary-earners	0.0520	0.0485	0.0350	0.0316	0.0392	0.0383	0.0413	0.0459
16. Rural wage-earners	0.1374	0.1101	0.0895	0.0755	0.0861	0.0834	0.1008	0.1338
17. Rural employers	0.0390	0.0397	0.0267	0.0251	0.0325	0.0320	0.0324	0.0321
18. Rural self-employed	0.2350	0.2191	0.1580	0.1425	0.1768	0.1731	0.1864	0.2077
19. Rural family helpers	0.504	0.0463	0.0338	0.0303	0.0373	0.0364	0.0397	0.0451
20. Firms	0.3551	0.3955	0.2490	0.2433	0.3288	0.3251	0.3107	0.2695
21. Agriculture	1.5737	0.6004	0.9710	0.5876	0.5835	0.5337	0.6379	0.6819
22. Mir	0.0348	1.0495	0.0248	0.0483	0.0560	0.0366	0.0384	0.0417
23. Coi	0.0224	0.0241	1.0688	0.0160	0.0224	0.0208	0.0279	0.0308
24. Industry	1.6098	1.7025	1.1272	2.4351	1.7949	1.5808	1.7456	1.9301
25. Electricity, gas and water	0.0336	0.0669	0.0243	0.0332	1.0581	0.0363	0.0410	0.0449
26 Modern services	0.9332	1.1488	0.7095	0.9055	0.9709	2.0243	0.9183	1.0742
27. Personal services	0.2901	0.3213	0.2038	0.2143	0.3056	0.2842	1.3023	0.3611
28. Government services	0.0195	0.0240	0.0140	0.0163	0.0219	0.0195	0.0204	1.235

Table 3 (continued)

Country and item	27	28	29	30	31	32	33	34	35	36	37	38
Pakistan												
Wants												
1. Food and drink	1.466	1.455	1.081	0.928	1.286	1.227	0.789	1.089	1.423	1.056	1.188	1.221
2. Clothing and footwear	0.279	0.277	0.207	0.177	0.245	0.235	0.151	0.209	0.273	0.202	0.228	0.234
3. Personal effects	0.074	0.073	0.057	0.048	0.065	0.063	0.040	0.057	0.073	0.054	0.063	0.063
4. Rent	0.136	0.134	0.104	0.092	0.125	0.121	0.077	0.108	0.148	0.105	0.116	0.126
5. Fuel and lighting	0.135	0.133	0.099	0.085	0.118	0.113	0.072	0.100	0.131	0.097	0.109	0.112
6. Health	0.059	0.059	0.043	0.037	0.051	0.049	0.032	0.044	0.056	0.042	0.048	0.049
7. Education	0.033	0.033	0.026	0.022	0.030	0.029	0.019	0.026	0.034	0.025	0.028	0.030
8. Others	0.815	0.807	0.628	0.532	0.731	0.705	0.450	0.631	0.829	0.608	0.689	0.705
Factors a/												
9-17												
Institutions												
18. Employers (professional level)	0.062	0.060	0.052	0.046	0.069	0.067	0.047	0.078	0.065	0.053	0.136	0.124
19. Non-manual workers	0.169	0.165	0.148	0.122	0.162	0.154	0.112	0.277	0.231	0.153	0.229	0.267
20. Manual workers	0.190	0.181	0.147	0.169	0.214	0.219	0.134	0.191	0.170	0.225	0.161	0.213
21. Self-employed	0.558	0.549	0.455	0.412	0.543	0.531	0.331	0.330	0.846	0.442	0.375	0.489
22. Large holdings	0.386	0.378	0.373	0.280	0.369	0.377	0.229	0.360	0.422	0.322	0.409	0.364
23. Medium holdings	0.442	0.437	0.366	0.286	0.392	0.384	0.242	0.354	0.422	0.342	0.402	0.365
24. Small holdings and the landless	1.247	1.250	0.803	0.680	0.989	0.903	0.595	0.783	0.857	0.760	0.881	0.841
25. Non-farm	0.150	0.162	0.084	0.083	0.123	0.112	0.073	0.081	0.114	0.091	0.088	0.101
26. Firms	0.229	0.223	0.162	0.163	0.220	0.192	0.426	0.145	0.189	0.219	0.168	0.215

continued

Table 3 (continued)

Country and item	27	28	29	30	31	32	33	34	35	36	37	38
Pakistan (continued)												
Activities												
27. Wheat and rice	1.408	0.395	0.273	0.247	0.664	0.387	0.207	0.274	0.357	0.273	0.300	0.309
28. Other agriculture	1.411	2.431	0.886	0.914	1.232	1.125	0.661	0.874	0.131	0.975	0.970	1.032
29. Mining and quarrying	0.122	0.129	1.101	0.141	0.133	0.199	0.084	0.131	0.122	0.129	0.112	0.117
30. Large-scale manufacturing	1.777	1.675	1.405	2.338	1.746	1.852	1.082	1.300	1.608	1.884	1.513	1.630
31. Small-scale manufacturing	0.692	0.686	0.515	0.442	1.797	0.840	0.401	0.518	0.678	0.503	0.567	0.581
32. Construction	0.014	0.014	0.011	0.010	0.013	1.013	0.111	0.011	0.016	0.011	0.015	0.013
33. Private housing	0.137	0.135	0.105	0.092	0.125	0.121	1.078	0.108	0.148	0.106	0.118	0.126
34. Electricity and gas	0.099	0.90	0.068	0.087	0.105	0.089	0.051	1.097	0.084	0.080	0.145	0.087
35. Wholesale and retail trade	0.667	0.666	0.571	0.449	0.609	0.502	0.278	0.359	1.449	0.425	0.396	0.420
36. Transport and communications	0.675	0.602	0.483	0.425	0.646	0.536	0.318	0.432	0.572	1.435	0.545	0.574
37. Banking and insurance	0.111	0.109	0.098	0.086	0.108	0.119	0.070	0.083	0.112	0.088	1.118	0.112
38. Government and other services	0.390	0.385	0.307	0.254	0.348	0.340	0.214	0.299	0.392	0.298	0.332	1.371

a/ Factors account not shown since it corresponds to the institutions account in the application to Pakistan.

Table 3 (continued)

Country and item	15	16	17	18	19	20
Republic of Korea						
1. Food	0.701	0.837	0.441	0.474	0.689	0.754
2. Others	0.380	0.445	0.237	0.254	0.367	0.407
3. Housing	0.113	0.143	0.073	0.079	0.117	0.123
4. Health	0.076	0.096	0.049	0.053	0.079	0.083
5. Education	0.084	0.099	0.053	0.056	0.082	0.099
6. Labour income	0.409	0.870	0.358	0.409	0.663	0.499
7. Capital income	1.477	1.217	0.789	0.809	1.078	1.502
8. Urban wage-earners	0.175	0.329	0.142	0.160	0.254	0.207
9. Urban salary-earners	0.303	0.552	0.243	0.273	0.429	0.360
10. Urban self-employed	0.440	0.382	0.239	0.248	0.335	0.450
11. Rural small holdings and the landless	0.106	0.093	0.058	0.060	0.081	0.109
12. Rural medium holdings	0.186	0.163	0.101	0.105	0.142	0.190
13. Rural large holdings	0.306	0.269	0.168	0.174	0.235	0.316
14. Firms	0.380	0.313	0.202	0.209	0.277	0.386
15. Agriculture	1.534	0.598	0.365	0.383	0.491	0.511
16. Mining	0.021	1.026	0.031	0.030	0.029	0.020
17. Modern industry	0.991	1.057	1.885	0.910	1.081	0.886
18. Traditional industry	0.215	0.253	0.216	1.202	0.259	0.212
19. Modern services	0.487	0.674	0.400	0.414	1.514	0.637
20. Traditional services	0.239	0.368	0.271	0.277	0.341	1.316

continued

Table 3 (continued)

Country and item	15	16	17	18	19	20
Republic of Korea						
1. Food	0.701	0.837	0.441	0.474	0.689	0.754
2. Others	0.380	0.445	0.237	0.254	0.367	0.407
3. Housing	0.113	0.143	0.073	0.079	0.117	0.123
4. Health	0.076	0.096	0.049	0.053	0.079	0.083
5. Education	0.084	0.099	0.053	0.056	0.082	0.099
6. Labour income	0.409	0.870	0.358	0.409	0.663	0.499
7. Capital income	1.477	1.217	0.789	0.809	1.078	1.502
8. Urban wage-earners	0.175	0.329	0.142	0.160	0.254	0.207
9. Urban salary-earners	0.303	0.552	0.243	0.273	0.429	0.360
10. Urban self-employed	0.460	0.382	0.239	0.248	0.335	0.450
11. Rural small holdings and the landless	0.106	0.093	0.058	0.060	0.081	0.109
12. Rural medium holdings	0.186	0.163	0.101	0.105	0.142	0.190
13. Rural large holdings	0.306	0.269	0.168	0.174	0.235	0.316
14. Firms	0.380	0.313	0.202	0.209	0.277	0.386
15. Agriculture	1.534	0.598	0.365	0.383	0.491	0.511
16. Mining	0.021	1.026	0.031	0.030	0.029	0.020
17. Modern industry	0.991	1.057	1.885	0.910	1.081	0.886
18. Traditional industry	0.215	0.253	0.216	1.202	0.259	0.212
19. Modern services	0.487	0.674	0.400	0.414	1.514	0.637
20. Traditional services	0.239	0.368	0.271	0.277	0.341	1.316

continued

Attention can now be shifted to the analysis of the third compartment, $M_{a,34}$, leaving the analysis of $M_{a,44}$ to the next section. A decomposition of $M_{a,34}$ into its transfer, open and closed multiplier effects requires an analyses of only three sub-matrices, as in equation 9.

$$M_{a,34} = M_{3,33} * M_{2,34} * M_{1,44} \qquad (9)$$

overall = closed * open * transfer

Tables 4 and 5 give $M_{1,44}$, $M_{2,34}$ and $M_{3,33}$, respectively, for the four countries.

Table 4, which contains $M_{1,44}$, captures the well known transfer effects within the input-output accounts. This will be referred to again later, but for the moment it should be noted that transfer effects are particularly important in industry, and that because of fewer linkages the multipliers for agriculture and the other sectors are lower.

In the case of Colombia the first column of table 4 shows an initial injection into agriculture of 1.0 to result in an addition to agriculture of 1.0414, mining 0.0036, industry 0.1560, modern services 0.1411 etc. The original injection of 1.0 leads to a total increase of 1.3459. These transfer effects will be traced through the rest of the system, including $M_{2,34}$ and $M_{3,33}$, in order to illustrate the working of the system.

Table 5, which presents $M_{2,34}$, captures open-loop effects. Because of the high diversity of income sources in Colombia, and in particular, the significant presence of non-rural beneficiaries from agricultural expansion, the original injection of 1.0 into agriculture leads to a 0.22 increase in rural incomes as compared with a 0.55 increase in non-rural incomes.

The closed-loop multipliers as captured in $M_{3,33}$ (in table 5) are associated with the consumption patterns of the households. The increases in income resulting from open-loop effects are used mainly to purchase consumer goods, which increase output, and in turn, increase factor income that is paid out as institutional income. If this part of the table is read on a row-by-row basis, excluding the initial injections and the few exceptions, it appears that the closed-loop multipliers are fairly constant. This can be interpreted as the result of similar household expenditure and savings patterns. The closed-loop multipliers are generally much higher than either the transfer or open-loop multipliers, which reflects the fact that consumption is larger than other categories of final demand or factor shares. For Colombia, an income receipt of 1.0 in any household group creates between 2.3856 and 3.0293 of total institutional income through the closed-loop effects. These can be compared with the impact for transfer effects by an activity which ranged between 1.3459 and 1.9658 in table 4, and with that for open-loop effects which varied between 0.0603 and 0.7663 in table 5. Being higher than the other multipliers and given their low variance, the closed-loop multipliers tend to dampen the effects of the transfer and open-loop multipliers.

Table 4. Transfer effects by type of activity in four countries

Country and item	21	22	23	24	25	26	27	28
Colombia								
21. Agriculture	1.0414	0.0275	0.6002	0.2071	0.0524	0.0417	0.1077	0.0600
22. Mining	0.0036	1.0136	0.0030	0.0258	0.0245	0.0074	0.0070	0.0050
23. Coffee	0.0000	0.0001	1.0532	0.0001	0.0001	0.0001	0.0156	0.0047
24. Industry	0.1560	0.1299	0.1133	1.3908	0.3336	0.2279	0.3495	0.2241
25. Electricity, gas and water	0.0016	0.0316	0.0018	0.0098	1.0249	0.0057	0.0083	0.0071
26. Modern services	0.1411	0.2754	0.1543	0.3262	0.1512	1.2676	0.1078	0.1293
27. Personal services	0.0012	0.0025	0.0012	0.0033	0.0062	0.0079	1.0062	0.0157
28. Government services	0.0010	0.0036	0.0010	0.0027	0.0028	0.0020	0.0015	1.0015

Republic of Korea

	15	16	17	18	19	20
15. Agriculture	1.115	0.039	0.070	0.066	0.031	0.007
16. Mining	0.004	1.007	0.020	0.019	0.013	0.003
17. Modern industry	0.162	0.178	1.422	0.411	0.357	0.092
18. Traditional industry	0.039	0.043	0.105	1.082	0.085	0.022
19. Modern services	0.043	0.130	0.120	0.112	1.175	0.159
20. Traditional services	0.023	0.048	0.103	0.096	0.078	1.030

Suriname

15. Modern agriculture	1.027	0.037	0.007	0.146	0.003	0.007
16. Traditional agriculture	0.014	1.085	0.001	0.914	0.000	0.001
17. Mining	0.000	0.000	1.229	0.000	0.001	0.000
18. Industry	0.066	0.062	0.053	1.075	0.025	0.048
19. Modern services	0.097	0.010	0.095	0.078	1.083	0.046
20. Traditional services	0.001	0.080	0.000	0.001	0.000	1.126

Table 4 (continued)

Country and item	27	28	29	30	31	32	33	34	35	36	37	38
Pakistan												
27. Wheat and rice	1.043	0.033	0.002	0.015	0.343	0.080	0.010	0.001	0.000	0.009	0.002	0.004
28. Other agriculture	0.254	1.284	0.029	0.170	0.215	0.154	0.037	0.011	0.002	0.138	0.028	0.064
29. Mining and quarrying	0.009	0.007	1.010	0.063	0.025	0.096	0.017	0.039	0.001	0.040	0.012	0.014
30. Large-scale manufacturing	0.161	0.074	0.195	1.304	0.318	0.483	0.204	0.080	0.012	0.705	0.182	0.265
31. Small-scale manufacturing	0.000	0.000	0.000	0.002	1.187	0.257	0.027	0.000	0.000	0.001	0.001	0.000
32. Construction	0.000	0.000	0.000	0.000	0.000	1 000	0.103	0.000	0.000	0.000	0.003	0.000
33. Private housing	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.001	0 000
34. Electricity and gas	0.017	0.009	0.007	0.035	0.033	0.020	0.007	1.036	0.003	0.021	0.078	0.018
35. Wholesale and retail trade	0.211	0.214	0.232	0.159	0.207	0.118	0.031	0.017	1.002	0.094	0.023	0.037
36. Transport and communications	0.120	0.052	0.061	0.066	0.152	0.061	0.015	0.008	0.015	1.043	0.082	0.100
37. Banking and insurance	0.010	0.008	0.020	0.020	0.017	0.032	0.014	0.005	0.009	0.013	1.033	0.024
38. Government and other services	0.002	0.001	0.011	0.002	0.002	0.007	0.001	0.001	0.001	0.011	0.006	1.038

Table 5. Open-loop and closed-loop effects in four countries

Country and institutions	Country index a/	Open-loop effects		Closed-loop effect d/					
				Urban groups			Rural groups		
		Agriculture b/	Industry c/	1	2	3	4	5	6
Colombia									
1. Urban salary-earner	10	0.161	0.054	1.469	0.509	0.479	0.359	0.495	0.552
2. Urban wage-earner	11	0.013	0.014	0.098	1.106	0.100	0.075	0.102	0.107
3. Urban self-employed	13	0.152	0.045	0.409	0.445	1.418	0.313	0.433	0.457
4. Rural large holdings	17	0.016	0.002	0.027	0.030	0.028	1.021	0.029	0.031
5. Rural medium holdings	18	0.101	0.013	0.153	0.169	0.157	0.119	1.168	0.178
6. Rural small holdings and the landless	16	0.066	0.007	0.082	0.091	0.084	0.064	0.091	1.097
7. Other institutions	e/	0.130	0.033	0.305	0.333	0.313	0.234	0.325	0.313
8. Firms	20	0.127	0.024	0.260	0.284	0.266	0.200	0.279	0.295
Total		0.766	0.192	2.803	2.967	2.845	2.385	2.922	3.030
Pakistan									
1. Urban salary-earner	19	0	0.004	1.143	0.145	0.143	0.147	0.154	0.162
2. Urban wage-earner	20	0.006	0.041	0.166	1.169	0.165	0.168	0.179	0.188
3. Urban self-employed	21	0.025	0.049	0.417	0.425	1.415	0.410	0.455	0.479
4. Rural large holdings	22	0.036	0.035	0.293	0.299	0.292	1.292	0.319	0.336
5. Rural medium holdings	23	0.070	0.030	0.311	0.318	0.310	0.306	1.340	0.358
6. Rural small holdings and the landless	24	0.300	0.047	0.786	0.805	0.782	0.765	0.865	1.913
7. Other institutions	f/	0.043	0.010	0.155	0.159	0.154	0.152	0.169	0.176
8. Firms	26	0.025	0.026	0.193	0.196	0.193	0.181	0.198	0.209
Total		0.505	0.242	3.464	3.516	3.454	3.421	3.679	3.821

continued

Country and institutions	Country index a/	Open-loop effects		Closed-loop effect d/					
				Urban groups			Rural groups		
		Agriculture b/	Industry c/	1	2	3	4	5	6
Republic of Korea									
1. Urban salary-earner	0	0.081	0.048	1.293	0.310	0.297	0.231	0.254	0.274
2. Urban wage-earner	8	0.044	0.028	0.170	1.180	0.173	0.134	0.148	0.159
3. Urban self-employed	10	0.190	0.040	0.314	0.341	1.321	0.249	0.278	0.304
4. Rural large holdings	13	0.133	0.028	0.220	0.239	0.255	1.175	0.195	0.213
5. Rural medium holdings	12	0.080	0.017	0.133	0.144	0.136	0.105	1.118	0.129
6. Rural small holdings and the landless	11	0.046	0.010	0.076	0.082	0.078	0.060	0.067	1.074
7. Other institutions	..	..	..	..	..	..	..	..	..
8. Firms	14	0.167	0.033	0.267	0.290	0.273	0.211	0.237	0.259
Total		0.741	0.204	2.473	2.586	2.503	2.165	2.297	2.412
Suriname									
1. Urban salary-earner	10 g/								
2. Urban wage-earner	10 g/	0.265	0.171		1.296	0.396		0.369	0.325
3. Urban self-employed	11	0	0	..	0.045	1.061	..	0.060	0.049
4. Rural large holdings	13 g/								
5. Rural medium holdings	13 g/	0	0	..	0.059	0.080	..	1.079	0.064
6. Rural small holdings and the landless	12	0.171	0.121		0.203	0.272		0.254	1.224
7. Other institutions	..	..	..	..	..	..		..	..
8. Firms	14	0.141	0.038		0.094	0.126	..	0.118	0.104
Total		0.577	0.330	..	1.697	1.935	..	1.880	1.766

a/ For country index of household groups see table 3.

b/ Agriculture refers to sector in row 21 for Colombia, 15 for the Republic of Korea and 27 and 28 for Pakistan, as indicated in table 3.

c/ Industry refers to sector in row 24 for Colombia, 30 for Pakistan, 17 for the Republic of Korea and 18 for Suriname, as indicated in table 3.

d/ No separate column for firms is included since the closed-loop effects of firms amount to zero.

e/ Country groups 12, 14, 15 and 19.

f/ Country groups 19 and 25.

g/ Not separately calculated.

Table 6 presents in columns 2 to 4 the combined effects on institutional incomes of the transfer and open-loop multipliers following the exogenous initial injection into agriculture of 1 million Colombian pesos.

One may now proceed to calculate the closed-loop effects resulting from the transfer and open-loop effects of the fourth column, as is done in the rest of the table. In the context of the present paper, the effect is traced on one household group only. While column 5 gives the applicable closed-loop effects for rural workers, column 6 gives the aggregate effects which, when summed, result in the overall multiplier for rural workers of 0.124. The difference between this and the value of 0.137 in table 3 is the result of neglecting the impact of other activities and institutions than those specified in table 6. Similarly, overall multipliers can be obtained for other household groups and firms.

These results suggest that the marginal share of benefits to rural workers from agricultural expansion amounts to about 5.8 per cent. Since the income share of rural workers in 1970 amounted to 3.5 per cent, it can be expected that an injection into agriculture has the effect of enhancing the relative position of rural workers in the distribution of income.

The multipliers in the preceding tables are deceptive in the sense that they do not allow an assessment of the benefit per household among the different household groups. In principle, dividing the multipliers by the number of households in each household group may give more insight. However, because of the underlying magnitudes of the data base, it happens that the higher-in-rank average household always benefits more in absolute terms than the average household which is next in rank. Hence the need to consider relative effects. This is done in table 7, which adapts the multiplier effects of the preceeding tables to give their relative distribution among the various institutional destinations.

Table 7 gives the percentage distribution of the multiplier benefit. The table is selective since it gives such results for initial injections into agriculture and industry only, and pursues the open and closed-loop multipliers for six population groups which are generally comparable among the four countries studied. To assess the marginal effect of the multipliers on income distribution, column 2 of table 7 gives the actual income shares in the SAM. In general, higher multiplier shares than actual shares for the urban self-employed (group 3) and rural small owners and landless workers (group 6) would promote equality, and lower multiplier shares than actual shares for these two groups would decrease equality.

In the case of Colombia the aggregate multipliers of injections into both agriculture and industry promote a redistribution of income from urban to rural population groups. Other aggregate multipliers not included in the table are those of mining, which point in the same direction but less significantly. The multipliers of energy distribute relatively more to urban than to rural

Table 6. Effects of an exogenous injection (+ 1.0) into agricultural activity on the income of rural households owning little or no land in four countries

Country and institutions	Country index (1)	Transfer effects (TE) and open-loop effects: Agriculture (2)	Industry (3)	Sum of activities (4)	Closed-loop effects (5)	Aggregate effects (6)
Colombia		TE = 1.041	TE = 0.156			
1. Urban salary-earner	10	0.1674	0.0084	0.1994	0.0815	0.0163
2. Urban wage-earner	11	0.0130	0.0022	0.0200	0.0908	0.0018
3. Urban self-employed	13	0.1528	0.0070	0.1858	0.0839	0.0156
4. Rural large holdings	17	0.0161	0.0004	0.0177	0.0810	0.0011
5. Rural medium holdings	18	0.1054	0.0021	0.1132	0.0909	0.0103
6. Rural small holdings and the landless	16	0.0690	0.0010	0.0720	1.0966	0.0790
7. Other institutions a/						
8. Firms	20	0.1326	0.0038	0.1497	0	0
Sum aggregates						0.1241
Pakistan		TE = 1.043	TE = 0.161			
1. Urban salary-earner	19	-	0.001	0.001	0.786	0.0008
2. Urban wage-earner	20	0.006	0.007	0.013	0.805	0.0105
3. Urban self-employed	21	0.026	0.008	0.034	0.782	0.0266
4. Rural large holdings	22	0.038	0.006	0.044	0.765	0.337
5. Rural medium holdings	23	0.073	0.005	0.078	0.865	0.0675
6. Rural small holdings and the landless	24	0.313	0.008	0.321	1.913	0.6141
7. Other institutions a/						
8. Firms	26	0.026	0.002	0.028	0	0
Sum aggregates						0.7530

continued

Table 6 (continued)

Country and institutions	Country index (1)	Transfer effects (TE) and open-loop effects: Agriculture (2)	Industry (3)	Sum of activities (4)	Closed-loop effects (5)	Aggregate effects (6)
Republic of Korea		TE = 1.12	TE = 0.16			
1. Urban salary-earner	9	0.090	0.011	0.101	0.076	0.0077
2. Urban wage-earner	8	0.045	0.006	0.051	0.082	0.0042
3. Urban self-employed	10	0.213	0.006	0.209	0.078	0.0163
4. Rural large holdings	15	0.146	0.005	0.151	0.060	0.0091
5. Rural medium holdings	12	0.090	0.003	0.093	0.067	0.0062
6. Rural small holdings and the landless	11	0.056	0.002	0.058	1.074	0.0623
7. Other institutions a/						
8. Firms	14	0.179	0.005	0.184	0	0
Sum aggregates						0.1058
Suriname		TE = 1.027	TE = 0.066			
1. Urban salary-earner	..	..	..	..	..	..
2. Urban wage-earner	10	0.272	0.011	0.283	0.203	0.0574
3. Urban self-employed	11	0	0	0	0.272	0
4. Rural large holdings						
5. Rural medium holdings	13	0	0	0	0.254	0
6. Rural small holdings and the landless	12	0.176	0.088	0.184	1.224	0.2252
7. Other institutions a/						
8. Firms	14	0.145	0.003	0.148	0	0
Sum aggregates						0.2826

Notes: Column 1: see tables 3 and 5.
Column 2: (TE from table 4) x (column 2, table 5).
Column 3: (TE from table 4) x (column 3, table 5).
Column 4: column 2 + column 3 and other activities.
Column 5: row 6 from table 5.
Column 6: (column 4) x (column 5).

Table 7. Percentage distributions obtained from social accounting matrices for four countries

Country and institutions	Country index (1)	Actual income shares and year a/ (2)	Aggregate multipliers Agriculture (3)	Aggregate multipliers Industry (3)	Open-loop effects Agriculture (4)	Open-loop effects Industry (4)	Closed-loop effects (5)					
							Urban groups			Rural groups		
							1	2	3	4	5	6
Colombia		(1970)										
1. Urban salary-earner	10	26.4	24.3	26.0	21.0	28.1	26.0	25.9	26.0	25.9	25.8	27.2
2. Urban wage-earner	11	5.9	4.1	5.4	1.7	7.3	5.4	5.4	5.4	5.4	5.3	5.3
3. Urban self-employed	13	22.7	21.7	22.7	19.8	23.4	22.7	22.6	22.7	22.6	22.5	22.5
4. Rural large holdings	17	1.4	1.7	1.5	2.1	1.0	1.5	1.5	1.5	1.5	1.5	1.5
5. Rural medium holdings	18	7.3	10.1	8.5	13.2	6.8	8.5	8.6	8.5	8.6	8.7	8.8
6. Rural small holdings and the landless	16	3.5	5.9	4.5	8.6	3.6	4.5	4.6	4.6	4.6	4.7	4.7
7. Other institutions	..	17.9	17.0	16.9	17.0	17.2	16.9	16.9	17.0	17.0	16.9	15.4
8. Firms	20	14.9	15.2	14.5	16.6	12.5	14.4	14.4	14.4	14.4	14.5	14.5
Pakistan		(1979)										
1. Urban salary-earner	19	6.9	4.9	5.4	0.0	1.7	5.8	5.8	5.8	6.1	5.7	5.7
2. Urban wage-earner	20	7.2	5.5	7.5	1.2	16.9	6.7	6.7	6.7	6.9	6.7	6.7
3. Urban self-employed	21	17.7	16.2	18.4	5.0	20.5	16.9	16.9	16.9	16.9	17.0	17.0
4. Rural large holdings	22	12.0	11.2	12.5	7.1	14.5	11.9	11.9	11.9	12.1	11.9	11.9
5. Rural medium holdings	23	12.9	12.9	12.8	13.9	12.4	12.6	12.6	12.6	12.6	12.7	12.7
6. Rural small holdings and the landless	24	30.4	35.7	30.0	58.4	19.4	31.9	32.0	31.9	31.6	32.3	32.4
7. Other institutions	..	7.2	6.9	6.1	8.5	4.1	6.3	6.3	6.3	6.3	6.3	6.2
8. Firms	26	6.1	6.7	7.3	5.0	10.7	7.8	7.8	7.9	7.5	7.4	7.4
Republic of Korea		(1975)										
1. Urban salary-earner	9	23.0	16.2	20.9	10.9	23.5	19.9	19.5	19.8	19.8	19.6	19.4
2. Urban wage-earner	8	13.6	9.4	12.2	5.9	13.7	11.5	11.3	11.5	11.5	11.4	11.3
3. Urban self-employed	10	20.0	22.9	20.9	25.6	19.6	21.3	21.5	21.4	21.4	21.4	21.5
4. Rural large holdings	13	14.0	16.2	14.8	17.9	13.8	14.9	15.1	15.0	15.0	15.0	15.1
5. Rural medium holdings	12	8.5	9.9	8.7	10.8	8.3	9.0	9.1	9.0	9.0	9.1	9.1
6. Rural small holdings and the landless	11	4.8	5.7	5.2	6.2	4.9	5.2	5.2	5.2	5.2	5.2	5.2
7. Other institutions	..	..	..	..	..	..	..	..	..	..	..	..
8. Firms	14	16.1	19.8	17.4	22.5	16.2	18.1	18.3	18.2	18.1	18.3	18.3
Suriname		(1979)										
1. Urban salary-earner	..	..	..	..	..	..	..	..	..	..	..	..
2. Urban wage-earner	10	46.0	44.6	46.9	45.9	51.8	..	42.5	42.5	..	41.9	42.4
3. Urban self-employed	11	3.3	2.7	3.1	0.0	0.0	..	6.5	6.5	..	6.8	6.4
4. Rural large holdings	..	..	..	..	..	..	..	..	..	..	..	..
5. Rural medium holdings	13	4.4	3.6	3.9	0.0	0.0	..	8.5	8.6	..	9.0	8.4
6. Rural small holdings and the landless	12	32.2	29.6	32.4	29.6	36.7	..	29.1	29.1	..	28.9	29.2
7. Other institutions	..	..	..	..	..	..	..	..	..	..	..	..
8. Firms	14	14.1	19.5	13.7	24.4	11.5	..	13.5	13.5	..	13.4	13.6

Notes: Column 1: see tables 3 and 5.
Column 2: calculated from the SAMs.
Column 3: calculated from the aggregate multiplier of table 4.
Column 4: calculated from the open-loop effect of table 5.
Column 5: calculated from the closed-loop effect of table 5 after deducting the initial injection of one unit from the diagonals and totals.

a/ Within parentheses.

households, while multipliers of the government sector appear to benefit household groups in various degrees at the cost of firms.

The relative redistributionary effects of the open-loop multipliers appear to be very significant. Agricultural benefits are shown to be shared among the specified urban and rural populations in proportions of 0.43 and 0.24, while the actual income shares are distributed in the proportions of 0.55 and 0.12 to specified urban and rural populations, respectively. Not shown in the table are injections into mining, which promote equality, and those into energy and government, which decrease equality.

These significant redistributionary effects, whether they are positive or negative, are neutralized to a great extent by the closed-loop effects. Table 7 shows for Colombia that the closed-loop effects are distributed among the urban and rural population groups in proportions which correspond closely to their actual shares. The gains obtained via the transfer and factor effects by a group are partly lost to other groups through consumption leakages.

The discussion of the vanishing income redistribution effects* may be recalled at this point. In the context of Colombia, vanishing effects are the result of the interaction between the following three factors: relatively weak transfer effects of agriculture, which is a sector with potential for a sustained positive redistributionary effect; a relatively weak control of agricultural resources by the largest group of rural households; and a very significant leakage from poorer to richer household groups through expenditure patterns.

The results for Colombia have been highlighted above. These can be briefly compared with those for Pakistan, the Republic of Korea and Suriname.

In Suriname, the aggregate multipliers of modern agriculture favour firms and disfavour households, mainly because of open-loop effects associated with the plantation-like nature of modern agriculture. Aggregate multipliers of industry, which correspond closely to open-loop effects, provide an increase in the actual income shares.

In Suriname, the closed-loop effects show a pattern favouring the self-employed in cities and the owner class in districts, but disfavouring wage-earners in cities and landless workers in districts. These closed-loop effects are not sufficient to change the impact of the open-loop effects, so that the final outcome generally favours firms at the cost of households.

Colombia, Pakistan and the Republic of Korea have in common a progressive redistributionary effect from richer towards poorer household groups following injections into agriculture or industry,

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*For instance, Taylor and Lysy [10].

though these effects are more significant in Pakistan and the Republic of Korea than in Colombia. This is partly because of open-loop effects, which are more discriminatory in Pakistan and the Republic of Korea than in Colombia. It is also the result of closed-loop effects, which tend to shift resources from richer to both poorer groups and firms, reflecting more diverging and self-constrained consumption patterns among poorer household groups in Pakistan and the Republic of Korea than in Colombia.

In general, firms in Pakistan and the Republic of Korea are able to capture relatively more of the aggregate benefit than in either Colombia or Suriname.

Table 8 adds the aggregate multipliers of the largest groups in terms of the number of households in urban and rural areas, namely, groups 3 and 6, which are also the poorest on a per capita basis. Table 8 shows the redistributionary impact on these household groups of injections into agriculture and industry.

Table 8. Income share of the two poorest groups
(Percentages)

Country	Actual share	Simulated share for injections in: Agriculture	Industry
Colombia	26.2	27.6	27.2
Pakistan	48.1	51.9	48.4
Republic of Korea	24.8	28.6	26.1
Suriname	35.5	32.3	35.5

Source: Adapted from table 7.

The picture which appears indicates the absence of a progressive redistributionary mechanism in Suriname, but the presence of a slightly progressive mechanism in Colombia, somewhat more progressive mechanisms in Pakistan, and even more in the Republic of Korea.

In general, agricutural multipliers show more progressive redistributionary effects than industrial multipliers (except in Suriname, where agriculture is understood to refer to modern plantations). Moreover, the aggregate multipliers of injections into a particular activity for all activities is higher for agriculture than for industry (see table 3), so that, as far as these two sectors are concerned, progressive redistribution and higher growth can go hand in hand. The results direct attention to the presence of degrees of freedom in the selection of balanced socio-economic development policies, despite the existence of countervailing mechanisms that cause parts of the redistribution and growth potential to vanish.

D. Activity - activity multipliers

With reference to table 3, the $M_{a,44}$ component gives the aggregate multipliers of injections into a particular activity on the activities account. As in the previous section, these aggregate multipliers can be decomposed into their transfer, open-loop and closed-loop effects. Open-loop effects, being expressions of cross-effects between accounts, are not applicable in the present case. Therefore, an analysis of the differences between the aggregate multiplier and that part of it which forms the transfer effects is sufficient to appreciate the nature of the remaining part which forms the closed-loop effects.

The aggregate multipliers of $M_{a,44}$ in table 3 can now be confronted with the previously discussed transfer effects of activities on activities, $M_{1,44}$, found in table 4. The latter represents the simpler inverse of Leontief.

As expected, first, the SAM contains more linkages than the Leontief, with the result that $M_{a,44}$ is substantially higher than $M_{1,44}$. Secondly, as a result of the heterogeneity of the linkages, the structural pattern of $M_{a,44}$ is also different from $M_{1,44}$.

The first point may be illustrated from table 9, which gives the frequency distribution of the size of the aggregate multipliers and the transfer effects, or the SAM-inverse and the Leontief-inverse, respectively. The percentage of elements of negligible size, which form the great majority in the Leontief-inverse in the four countries, is significantly reduced in the SAM-inverse, reflecting the incorporation of many more indirect effects and additional interdependencies in a social accounting framework. Summing up elements of less than 0.2 gives a result of 86 per cent in the Leontief-inverse and only 50 per cent in the SAM-inverse for Colombia. The reductions are from 100 per cent to 70 per cent for Suriname, from 93 per cent to 17 per cent for the Republic of Korea, and from 90 per cent to 42 per cent for Pakistan. The additional interdependencies brought in by the SAM are, relatively speaking, the most extensive in the case of the Republic of Korea.

The second point can be illustrated from table 10. For Colombia, sectors are ranked according to the Leontief total column multipliers in the order of industry (1.97), mining (1.49), services (1.45) and agriculture (1.35). Their contributions to production activity and their ranking are significantly different in the SAM total column multipliers: services (5.19), mining (4.94), agriculture (4.52) and industry (4.26). A structural analysis based on the Leontief framework instead of the SAM framework would have led to the wrong decisions being taken on the allocations required to achieve the highest growth rates. Similar contrasts occur in the other countries. For instance, the attractive position occupied by industry, in a structural analysis based on the Leontief framework, as the foremost contributer to production activity is taken over by the activities of service, mining and agriculture, which individually contribute more than industry in a SAM framework; this is true of Pakistan, the Republic of Korea and Suriname (in Suriname, mining

Table 9. Size distributions of the off-diagonal elements of the SAM-inverse and the Leontief-inverse for four countries
(Percentages)

Element size	Colombia		Pakistan		Republic of Korea		Suriname	
	SAM aggregate multiplier	Leontief transfer effects	SAM aggregate multiplier	Leontief transfer effects	SAM aggregate multiplier	Leontief transfer effects	SAM aggregate multiplier	Leontief transfer effects
<0.050	46.4	66.0	8.3	71.2	16.7	46.7	46.7	73.3
0.051 - 0.100	3.6	3.6	11.4	9.8	0.0	20.0	10.0	23.3
0.101 - 0.150	0.0	10.7	21.2	3.8	0.0	16.7	3.3	3.3
0.151 - 0.200	0.0	5.4	0.8	5.3	0.0	10.0	10.0	0.0
0.201 - 0.250	3.6	5.4	2.3	4.5	10.0	0.0	6.7	0.0
0.251 - 0.500	8.9	7.1	22.7	4.5	43.3	6.7	16.7	0.0
0.501 - 1.000	21.4	1.8	21.2	0.8	23.3	0.0	6.7	0.0
<1.000	16.1	0.0	12.1	0.0	6.7	0.0	0.0	0.0

Source: Tables 3 and 4.

Table 10. Own multipliers and total column multipliers in the SAM-inverse and the Leontief-inverse

Sector	Colombia		Pakistan		Republic of Korea		Suriname	
	SAM aggregate multiplier	Leontief transfer effects	SAM aggregate multiplier	Leontief transfer effects	SAM aggregate multiplier	Leontief transfer effects	SAM aggregate multiplier	Leontief transfer effects
Agriculture								
Own	1.57	1.04	1.41	1.04	1.58	1.12	1.07	1.03
Total	4.52	1.35	7.51	1.83	3.50	1.38	1.86	1.21
Mining								
Own	1.05	1.02	1.10	1.01	1.03	1.01	1.23	1.23
Total	4.94	1.49	5.82	1.57	3.98	1.45	1.88	1.39
Industry								
Own	2.44	1.39	2.34	1.30	1.89	1.42	1.22	1.08
Total	4.26	1.97	5.49	1.85	3.17	1.84	1.85	1.31
Services								
Own	1.02	1.00	1.37	1.04	1.61	1.18	1.51	1.08
Total	5.19	1.45	6.37	1.56	3.82	1.74	1.88	1.11

Source: Tables 3 and 4.

Note: Sectors are defined for each country as follows and as indicated in table 3:

Sector	Colombia	Pakistan	Republic of Korea	Suriname
Agriculture	Agriculture	Wheat and rice	Agriculture	Modern agriculture
Mining	Mining	Mining and quarrying	Mining	Mining
Industry	Industry	Large-scale manufacturing	Modern industry	Industry

precedes industry). The results should not be taken to mean that if the Republic of Korea, for instance, had in the past expanded more in agriculture, mining or services than in industry it would have necessarily achieved a higher overall growth. For one thing, the exogenous expansion potential both domestically and in the rest of the world - denoted by x - was, and will probably remain, lower for the non-industrial sectors than for industry. In addition, neither SAM nor the input-output matrix takes into account limits on the supply side, which are likely to be more demarcated for the non-industrial sectors than for industry in most developing countries.

As is well known, labour use and capital use per unit of additional production can be multiplied by the contribution to production activities to give the employment and investment effects. It follows that the impact of alternative allocations to activities on the marginal use of labour and capital would be less meaningful when they are derived from the partial framework of Leontief's transfer effects than when they are derived from a more general framework that incorporates the aggregate effects of SAM.

E. Conclusions

This paper reported primarily on the results of a multiplier analysis that has been applied to social accounting matrices of Colombia, Pakistan, the Republic of Korea and Suriname. The construction of these four matrices forms a major addition to the already available SAMs for other countries. Although the construction of each matrix in this paper is briefly introduced, more details on the estimation of the four SAMs are to be published elsewhere.

In addition to its use for calibrating economy-wide models, SAM forms an appropriate framework for a comparative analysis of the structural properties of different socio-economic systems. The multipliers obtained are found to be significant, stable and meaningful. A few selected results on the aggregate multipliers and their decomposition into transfer, open-loop and closed-loop effects are presented here for purposes of illustration.

The results indicate the absence of progressive redistributive mechanisms in Suriname. On the other hand, they show the presence of slightly progressive mechanisms in Colombia, somewhat more progressive mechanisms in Pakistan, and the most progressive in the Republic of Korea. These results are partly due to open-loop effects that link particular sectoral activities to particular factor incomes and particular household groups in both Pakistan and the Republic of Korea as compared with relatively weaker correspondence between activities, factors and households in Colombia. The results are also due to closed-loop effects that tend to shift relatively less resources from poorer to richer groups than the other way round, reflecting more self-oriented consumption patterns among poorer household groups in Pakistan and the Republic of Korea as compared with more similar consumption patterns among both rich and poor household groups in Colombia.

In all four case-studies, agricultural multipliers show more progressive redistributionary effects than industrial multipliers. The growth effect is also shown to be higher for agriculture than for industry, so that for these two sectors progressive redistribution and higher growth are not in conflict with each other. Other results point to the presence of degrees of freedom in selecting balanced socio-economic development policies, despite the existence of countervailing processes that cause parts of the redistribution and growth potentials to vanish.

Furthermore, the SAM multipliers obtained in all four case-studies differ appreciably from those derived from that part of the SAM-inverse that corresponds to the Leontief-inverse. This leads to the conclusion that when a development problem, such as the macro-analysis and broader planning of capital use, labour use and growth strategies, involves significant linkage effects on income and expenditure, it can be expected that results derived from the input-output model will be inferior to those derived from the social accounting framework. Although obvious, it should be emphasized that this conclusion does not deny the recognized usefulness of the input-output model in analytical and planning contexts other than those described in this paper.

For an effective analysis of development mechanisms and problems in different socio-economic settings it is desirable to construct and make available SAMs for many more countries and for more years. Difficulties in the way of standardization and comparability will take some time to solve, although the multiplier analysis presented here may help to provide clues as to which SAM classifications, entries and analytical designs are more meaningful in a comparative analysis of socio-economic systems and their implications for global policy-making.

Annex

DECOMPOSITION OF THE SOCIAL ACCOUNTING MATRIX MULTIPLIERS

The social accounting matrix can be written as a partitioned coefficient matrix as in table 2.

$$A = \begin{pmatrix} o & o & A_{13} & o \\ o & o & o & A_{24} \\ o & A_{32} & A_{33} & o \\ A_{41} & o & o & A_{44} \end{pmatrix} \qquad (1)$$

A_{13} represents the intersection between wants and households and firms, A_{24} that between factors and activities etc. Separate A from A and invert t. obtain M_1, as in equation 2.

$$A = \begin{pmatrix} o & o & o & o \\ o & o & o & o \\ o & o & A_{33} & o \\ o & o & o & A_{44} \end{pmatrix} \quad M_1 = (I - A)^{-1} = \begin{pmatrix} I & o & o & o \\ o & I & o & o \\ o & o & (I-A_{33})^{-1} & o \\ o & o & o & (1-A_{44})^{-1} \end{pmatrix} \qquad (2)$$

$(1-A_{44})^{-1}$ is nothing more than the Leontief-inverse from the simple sectoral models. It translates original exogenous impusles in final demand into sectoral output. $(I-A_{33})^{-1}$ fulfills the same role with regard to institutions. It calculates the first-round effect of an exogenous increase in institutional income through the transfer mechanisms between the different institutions.

As a result of the separation in equation 2, A^* becomes:

$$A^* = \begin{pmatrix} o & o & A_{13}^* & o \\ o & o & o & A_{24}^* \\ o & A_{32}^* & o & o \\ A_{41}^* & o & o & o \end{pmatrix} \quad \text{where:} \quad \begin{aligned} A_{13}^* &= A_{13} \\ A_{24}^* &= A_{24} \\ A_{32}^* &= (I-A_{33})^{-1} A_{32} \\ A_{41}^* &= (I-A_{44})^{-1} A_{41} \end{aligned} \qquad (3)$$

A^* shares some of the properties of a permutation matrix. It contains only one block of non-zero entries within each set of rows and each set of columns. Raising such a matrix to the power of k does not alter this property, it only shifts the position of each block. Since all blocks shift at the same time, there are only four permutations possible with different positions of the blocks.

Given k=4, one can obtain M_2 and M_3 as specified in equations 4 and 5, respectively.

$$M_2 =$$

$$\begin{array}{llll} I & A^*_{13}A^*_{32} & A^*_{13} & A^*_{13}A^*_{32}A^*_{24} \\ A^*_{24}A^*_{41} & I & A^*_{24}A^*_{41}A^*_{13} & A^*_{24} \\ A^*_{32}A^*_{24}A^*_{41} & A^*_{32} & I & A^*_{32}A^*_{24} \\ A^*_{41} & A^*_{41}A^*_{13}A^*_{12} & A^*_{41}A^*_{13} & I \end{array} \qquad (4)$$

$$M_3 =$$

$$\begin{array}{llll} (I-A^*_{13}A^*_{32}A^*_{24}A^*_{41})^{-1} & o & o & o \\ o & (I-A^*_{24}A^*_{41}A^*_{13}A^*_{32})^{-1} & o & o \\ o & o & (I-A^*_{32}A^*_{24}A^*_{41}A^*_{13})^{-1} & o \\ o & o & o & (I-A^*_{41}A^*_{13}A^*_{32}A^*_{24})^{-1} \end{array} \qquad (5)$$

Both M_2 and M_3 now possess the structure that they need to have in order to explain open-loop and closed-loop effects, respectively. As can be seen in equation 4, all block diagonals in M_2 consist of identity matrices. Consequently, M_2 leaves effects within accounts unaltered. On the other hand, M_3 closes the link between the different sets of accounts; all off-diagonal blocks are filled.

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SOMMAIRE

La politique industrielle en Asie de l'Est, 1950-1985

Heinz W. Arndt

Très comparables en cela au Japon de l'entre-deux-guerres, les huit pays en développement d'Asie de l'Est à économie de marché ont appliqué une stratégie axée sur l'exportation. Cette stratégie a donné des succès spectaculaires, surtout dans les pays ou régions nouvellement industrialisés (Hong-kong, République de Corée, Singapour et province chinoise de Taiwan. Elle a permis non seulement de réaliser des taux de croissance économique dont on ne trouve guère l'égal dans aucun autre pays en développement, mais encore d'obtenir des résultats assez remarquables quant à la distribution du revenu et à d'autres critères de développement. Le succès des pays et territoires d'Asie de l'Est est largement dû à la qualité de leurs politiques macro-économiques. Le fait que les quatre pays et régions susmentionnés soient aussi bien parvenus à réaliser dans leur structure industrielle la transition du remplacement des importations à l'orientation vers l'exportation, puis des industries de main-d'oeuvre aux industries où les compétences spécialisées et la technologie tiennent de plus en plus de place, a très souvent été attribué à l'influence de ce que l'on appelle le "modèle japonais" - entendu comme une formule reposant sur un encadrement étroit par les pouvoirs publics qui, prévoyant l'évolution des avantages comparés, retiennent les gagnants et éliminent les perdants. En matière de politique industrielle, l'intérêt du modèle japonais tient moins au rôle du gouvernement dans la sélection des gagnants qu'à son action dans l'élimination des perdants. L'enseignement à en tirer est qu'il faut aider la main-d'oeuvre et le capital à se détourner des industries perdantes. L'intervention des pouvoirs publics s'est inspirée du principe selon lequel l'application - sur les marchés des biens, des capitaux et du travail - d'une structure des prix basée sur des mesures d'incitation doit faciliter l'ajustement, et par conséquent favoriser le développement industriel. De toute évidence, les pays qui intègrent leurs économies nationales dans l'économie du marché mondial sont plus exposés aux fluctuations cycliques dans les pays développés. Cependant, les performances respectives des économies montrent clairement que, dans l'ensemble, les gains dynamiques résultant des échanges internationaux et des courants de facteurs sont beaucoup plus importants que les risques inhérents à la vulnérabilité.

Exportations et absorption de main-d'oeuvre : l'exemple du secteur manufacturier du Bangladesh

Dilip Kumar Roy

L'étude vise essentiellement à déterminer l'incidence des exportations manufacturières sur l'emploi au Bangladesh et à rechercher quelle est l'importance relative des exportations manufacturières et de la croissance de la production dans le secteur manufacturier. L'auteur relève que, malgré la faiblesse de la contribution de ce secteur au produit intérieur brut (PIB), l'expansion des exportations est principalement due aux produits manufacturiers. Certaines industries - thé, textiles de jute, cuir - s'avèrent orientées vers l'exportation. D'après les constatations faites, l'absorption de main-d'oeuvre due à la production manufacturière pour l'exportation est liée de manière positive et significative à l'absorption de main-d'oeuvre par unité produite, autrement dit les exportations du Bangladesh absorbent de la main-d'oeuvre. Ce fait a des implications pour la croissance de l'emploi due aux exportations manufacturières.

Etude comparée des tableaux d'entrées-sorties et de la comptabilité sociale dans l'analyse macro-économique de la politique de développement

S.I. Cohen

Les matrices de comptabilité sociale (MCS) offrent un cadre fiable pour des analyses de multiplicateurs donnant des résultats significatifs, cohérents et stables. L'auteur décrit l'établissement et le contenu des matrices de comptabilité sociale pour quatre pays : Colombie, Pakistan, République de Corée et Suriname. L'étude examine les MCS en tant que modèle d'analyse indépendant, énonce les multiplicateurs et les décompose en transferts et effets de boucle ouverte et de boucle fermée, et évalue les multiplicateurs d'activités de production par rapport à des variables stratégiques de croissance et de distribution dans les quatre MCS. On y trouve également une comparaison des résultats avec ceux qui peuvent être obtenus à partir du cadre plus étroit des tableaux d'entrées-sorties.

EXTRACTO

La política industrial en Asia oriental, 1950-1985

Heinz W. Arndt

Imitando el ejemplo del Japón en el período interbélico, los ocho países en desarrollo de economía de mercado de Asia oriental han proseguido una estrategia orientada a las exportaciones. La estrategia ha resultado espectacularmente eficaz, sobre todo en el caso de países o zonas de industrialización reciente (Hong Kong, República de Corea, Singapur, Taiwán, Provincia de China). Ellas no sólo alcanzaron ritmos de crecimiento económico casi inigualados por otro país en desarrollo, sino que se desenvolvieron relativamente bien en cuanto a distribución del ingreso y otros criterios de desarrollo. Gran parte del éxito de los países y territorios del Asia oriental se ha debido a la bondad de las políticas macroeconómicas. La forma satisfactoria en que los países o zonas de reciente industrialización en el Asia oriental han logrado, primero, transformar la estructura industrial desplazándose de la sustitución de importaciones a la orientación hacia las exportaciones y, luego, de industrias con elevado coeficiente de mano de obra a otras progresivamente especializadas y de gran densidad de tecnología, se ha atribuido por lo general a la influencia del denominado "modelo japonés" interpretado como fuerte orientación oficial, por conducto de la previsión de cambios en las ventajas comparativas, la selección de productores con porvenir y la eliminación paulatina de los sin expectativas. En la política industrial, el valor del modelo japonés reside menos en la función del gobierno relativa a seleccionar triunfadores que en la de eliminar gradualmente a los derrotados. La enseñanza recogida aquí es que conviene ayudar a la mano de obra y al capital a abandonar esas industrias. La intervención oficial se ha inspirado en el precepto de que el incentivo de la estructura de precios, en el mercado de bienes, capital y mano de obra, debe promover el ajuste y consiguientemente el desarrollo industrial. Sin duda, los países que integran sus economías nacionales en la economía del mercado mundial están más expuestos a fluctuaciones cíclicas en los países desarrollados. Pero la experiencia del rendimiento económico relativo indica con firmeza que los beneficios dinámicos del comercio internacional y las corrientes de factores en definitiva compensan con creces los riesgos de vulnerabilidad.

Exportaciones y absorción de mano de obra: el caso de las manufacturas de Bangladesh

Dilip Kumar Roy

El objetivo principal del estudio es evaluar, en Bangladesh, la repercusión de las exportaciones de manufacturas en el empleo y también descubrir una indicación de la importancia relativa de las exportaciones de manufacturas para el crecimiento de la producción

manufacturera. La monografía sostiene que si bien la contribución de la industria manufacturera al producto interno bruto (PIB) es pequeña, en la ampliación de las exportaciones predominan los artículos manufacturados. Algunas de las industrias, como las del té, tejidos del yute y las industrias del cuero, resultan orientadas hacia la exportación. Las investigaciones denotan que la absorción de mano de obra merced a la producción de artículos manufacturados para su exportación se relaciona positiva y notablemente con la absorción de mano de obra por unidad de producto, esto es, las exportaciones de Bangladesh absorben fuerza de trabajo. Esto repercute en la ampliación del empleo debida a las exportaciones de artículos manufacturados.

El insumo-producto y la contabilidad social en el macroanálisis de la política de desarrollo

S.I. Cohen

Las matrices de contabilidad social aportan un sólido marco para proceder al análisis de multiplicador con resultados significativos, trascendentales y estables. La monografía da cuenta de la confección y el contenido de matrices de contabilidad social para cuatro países, a saber, Colombia, Pakistán, la República de Corea y Suriname. Estima que dichas matrices constituyen de por sí un modelo de análisis; formula los multiplicadores y su descomposición en las transferencias, los efectos con circuito abierto y cerrado; y evalúa los multiplicadores de las actividades de producción en variables estratégicas de crecimiento y distribución en las cuatro matrices aludidas. Se comparan asimismo los resultados con los obtenidos del marco más restringido de la matriz de insumo producto.

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