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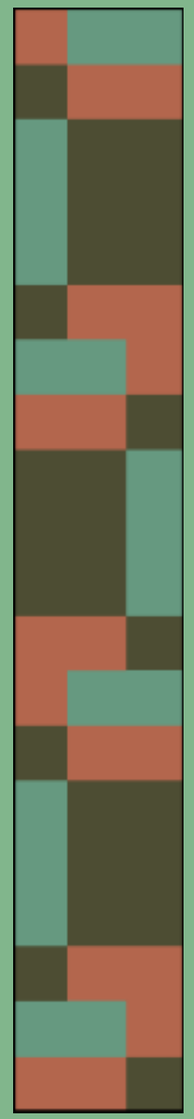

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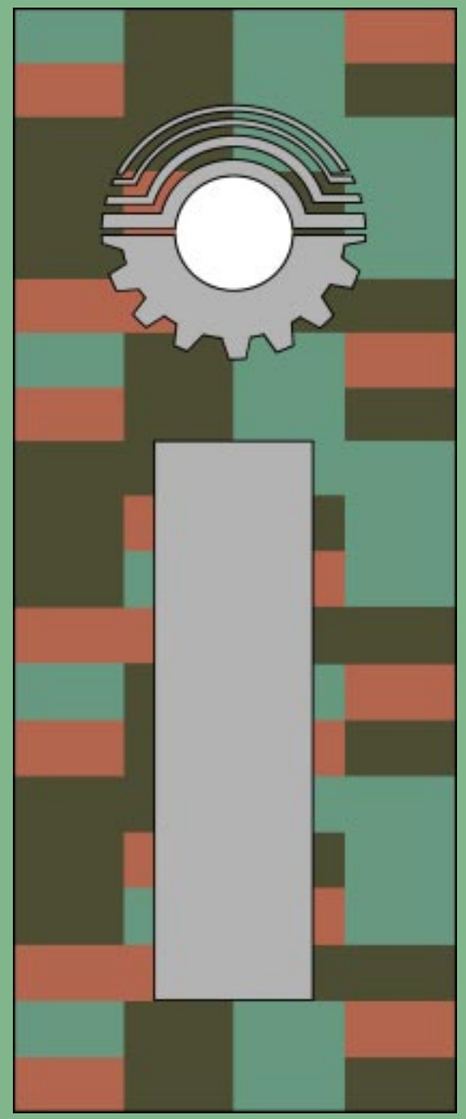

Economic and Social Commission for Asia and the Pacific

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All correspondence should be addressed to:
Chief
International Trade and Industry Division
Economic and Social Commission for Asia and the Pacific (ESCAP)
United Nations Building
Rajdamnern Avenue
Bangkok 10200, Thailand

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CONTENTS

PART I

I. FOREIGN DIRECT INVESTMENT, REGIONAL ECONOMIC INTEGRATION AND EFFICIENCY-SEEKING INDUSTRIAL RESTRUCTURING IN ASIA: TRENDS, PATTERNS AND PROSPECTS

Nagesh Kumar [1]

A. Introduction

Foreign direct investment (FDI) enables its host countries to integrate into the global production networks of multinational enterprises (MNEs), which account for the bulk of global production activity. Having grown at an average annual rate of about 25 per cent over the 1990s, FDI inflows have emerged as the most important agent of global economic integration. The expanding magnitude of FDI inflows tends to generate optimism among developing countries with regard to its potential for integrating with the world economy in addition to expediting the process of their development with the help of resources that normally come associated with FDI, e.g. technology, marketing and organizational know-how and sometimes market access. Hence, most developing countries in Asia as elsewhere have liberalized their policy regimes towards FDI inflows and have also adopted promotional policies to attract greater magnitudes of these inflows. However, FDI inflows increasingly became concentrated in a handful of high- and middle-income countries over the 1990s and poorer countries have been marginalized.

FDI has also emerged as an important agent of efficiency-seeking restructuring of industry across countries. The Plaza Accord and growing labour scarcity in Japan provoked the early industrial restructuring in Asia. In order to regain their lost competitiveness, Japanese corporations responded by shifting their production process to East Asian countries and subsequently to South-East Asian countries in a manner explained by the flying geese theory. The more recent trend of restructuring has been provoked by trade liberalization across the world and facilitated by regional economic integration. Again these trends have raised optimism among poorer countries for participating in the industrial restructuring and boosting their share of world output and manufactured exports.

Against that background this paper reviews the recent trends and patterns in global FDI flows especially in the context of Asian developing countries (section B). It then reviews the emerging patterns of industrial restructuring in different parts of the world (section C) and examines the patterns in Asia. It also examines the prospects of poorer Asian countries participating in the process in the light of the determinants of the restructuring (section D). Then the progress of regional economic integration in the South-East and South Asian countries is reviewed and patterns of industrial restructuring that it is leading to are examined (section E). Finally, the paper concludes with a recapitulation of the findings and policy implications (section F).

B. Globalization and patterns of foreign direct investments

FDI emerged as the most important agent of integration of economic activities across countries in the 1990s. Compared with the average annual growth of trade in goods and services of about 6 to

[1] Senior Fellow, Research and Information System for Developing Countries, New Delhi.

7 per cent over the 1990s, FDI inflows grew at an average annual rate of 20 per cent during 1991-1995 and at 32 per cent during 1996-1999 despite the economic crisis in some important regions of the world. As a result, the magnitude of global FDI inflows increased from US$ 159 billion in 1991 to US$ 865 billion in 1999 (table 1). The growth in the magnitude of FDI over the 1990s was accompanied by a number of changes in the patterns, as summarized below.

1. Cross-border mergers and acquisitions driving the recent expansion

The recent growth of FDI flows has been fuelled by cross-border mergers and acquisitions (M&As) in North America and Europe as part of an ongoing wave of industrial restructuring and consolidation. The value of cross-border M&As sales grew from US$ 81 billion to US$ 720 billion over 1991-1999 (table 2). The bulk of these M&As (US$ 645 billion of the US$ 720 billion) was concentrated in the industrialized countries. Figure 1 reveals the strong correspondence between the growth of FDI inflows and that of cross-border M&As. The industrial restructuring and consolidation in the industrialized world, in turn, was provoked by regional economic integration, as seen later.

2. FDI inflows in developing countries

FDI inflows received by developing countries expanded from under US$ 42 billion in 1991 to nearly US$ 208 billion in 1999. The growth of FDI inflows in developing countries seems to have been slower than that of global inflows, especially in the late 1990s (figure 2). The share of developing countries in FDI inflows rose sharply during the early 1990s from 26 per cent in 1991 to about 40 per cent in 1994. Since then it has steadily declined to under 24 per cent in 1999 (figure 3). The sharp rise in the share of developing countries in the early 1990s was largely due to the emergence of China as the most important host to FDI in the developing world.

Table 1. Global FDI inflows, by broad host groups, 1991-1999

(Millions of US$)

Host region	1991	1992	1993	1994	1995	1996	1997	1998	1999
World	158 936	173 761	218 094	255 988	331 844	377 516	473 052	680 082	865 487
Industrialized countries	114 792	119 692	138 762	145 135	205 693	219 789	275 229	480 638	636 449
Developing countries	41 696	49 625	73 045	104 920	111 884	145 030	178 789	179 481	207 619
Share of developing countries	26.23446	28.5593	33.4924	40.9863	33.7158	38.4169	37.79479	26.3911	23.989
Share of developing countries excluding China	24.15087	23.6579	23.8904	32.0129	25.6879	31.0818	31.37779	21.3301	20.267
Least developed countries	1 830	1 459	1 743	1 168	2 001	2 394	2 524	3 715	4 527
Share of LDCs	1.151407	0.83966	0.7992	0.45627	0.60299	0.63415	0.533557	0.54626	0.5231

Source: Author based on UNCTAD data.

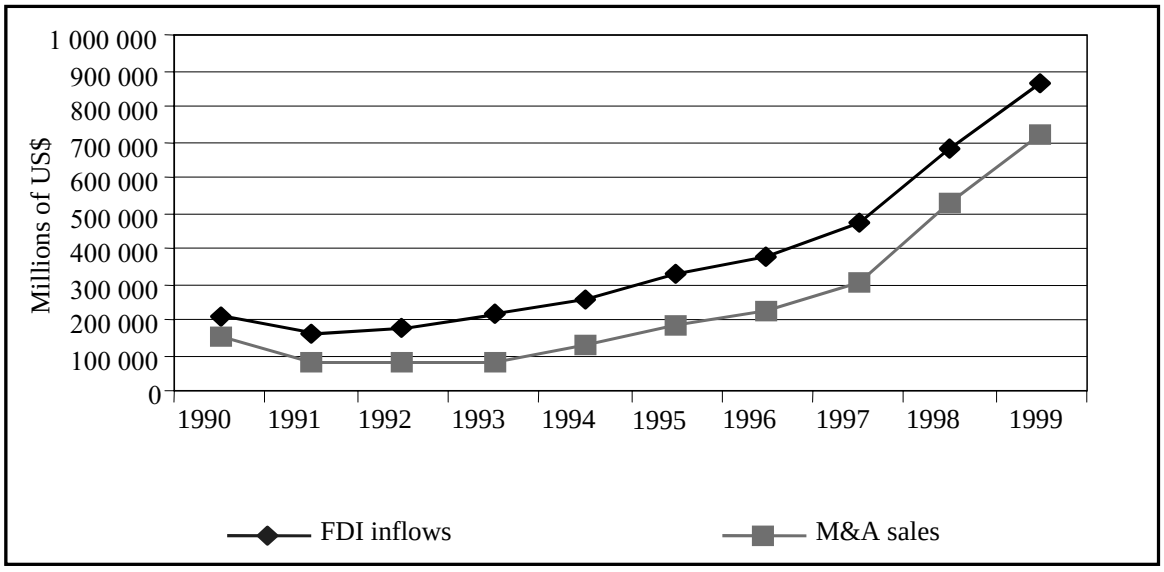
Table 2. Cross-border mergers and acquisitions sales, by broad regions of seller, 1991-1999

(Millions of US$)

Region/economy	1991	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL WORLD	80 713	79 280	83 064	127 110	186 593	227 023	304 848	531 648	720 109
Industrialized countries	74 057	68 560	69 127	110 819	164 589	188 722	234 748	445 128	644 590
European Union	36 676	44 761	38 537	55 280	75 143	81 895	114 591	187 853	344 537
United States of America	28 226	15 839	19 978	44 730	53 237	68 069	81 707	209 548	233 032
Developing countries	5 838	8 119	12 782	14 928	15 966	34 700	64 573	80 755	64 550
Latin America and the Caribbean	3 529	4 196	5 110	9 950	8 636	20 508	41 103	63 923	37 166
Asia	2 182	3 614	7 347	4 701	6 950	13 368	21 293	16 097	25 262
South, East and South-East Asia	2 051	3 411	7 267	4 652	6 278	9 745	18 586	15 842	25 003

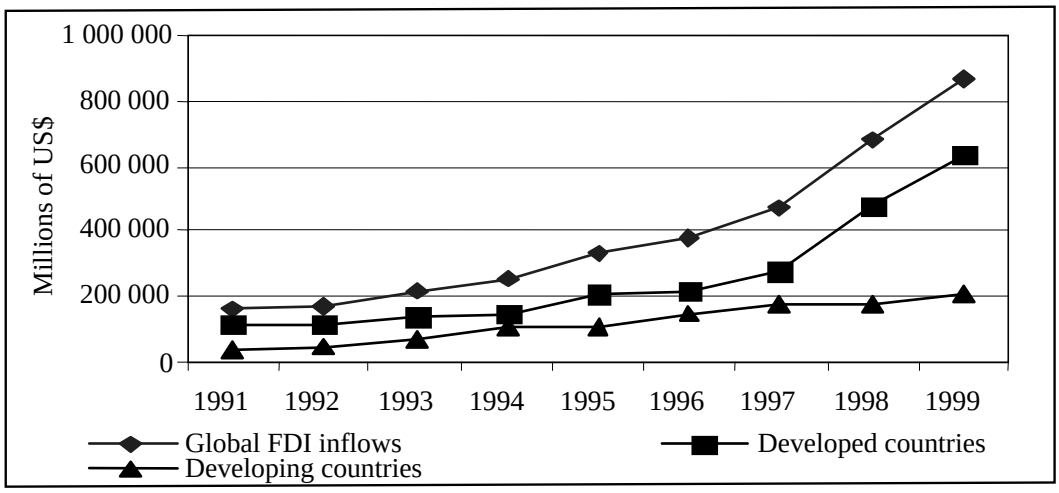
Source: Author based on UNCTAD data.

Figure 1. Global FDI inflows and mergers and acquisition sales, 1990s



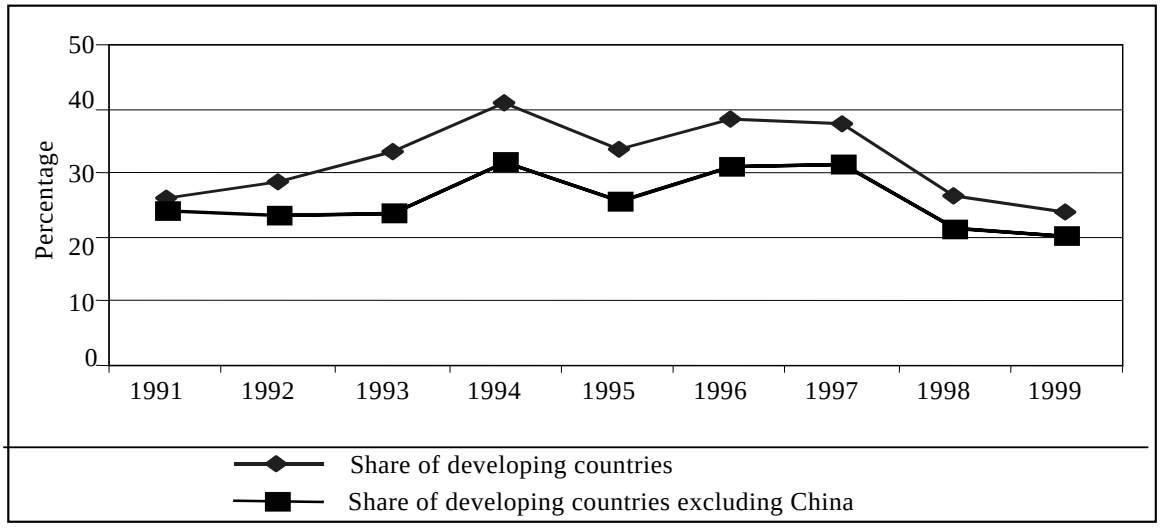
Source: Tables 1 and 2.

Figure 2. FDI inflows to industrialized and developing countries in the 1990s



Source: Tables 1 and 2.

Figure 3. Share of developing countries in global FDI inflows in the 1990s



Source: Table 1.

3. Interregional patterns of FDI inflows

There has also been a shift in the relative importance of different regions as hosts to FDI inflows received by the developing countries since 1993. Developing Asia has been the most important host region for FDI inflows, accounting for over half of FDI inflows to developing countries. Initially, developing Asia's share showed a rising trend peaking at 70 per cent in 1993 (figure 4). However, its importance has declined steadily since then. Latin American countries have steadily improved their share since 1993, with their share converging to the Asian level towards the end of the decade.

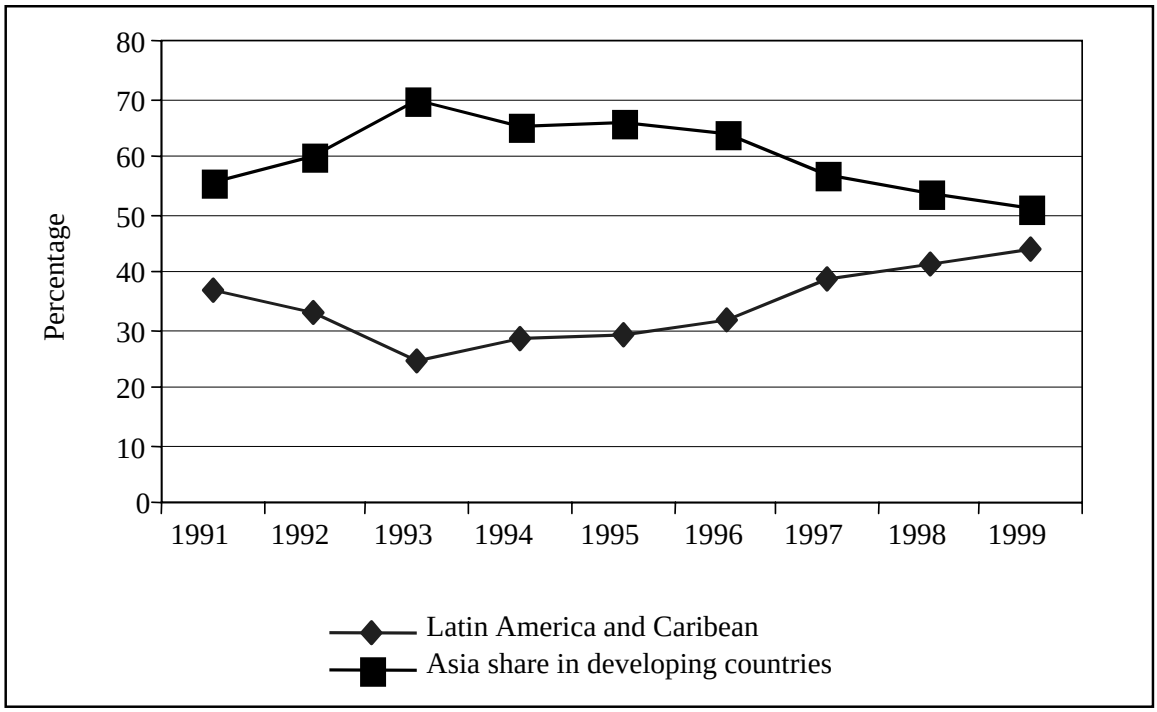
(a) Regional economic integration boosts Latin America's share in FDI inflows

Several trends have contributed to this reorganization of regional distribution of FDI inflows in favour of Latin America. These include the strong trend towards regional economic integration in Latin America with Mexico joining NAFTA and the emergence of MERCOSUR. Three countries involved in these regional trading blocs, i.e. Argentina, Brazil and Mexico, attracted US$ 65 billion in FDI inflows in 1999 compared with just US$ 7 billion in 1991. Privatization and debt-equity swaps also contributed to concentration of FDI inflows in Latin America.

(b) Shadow of the East Asian crisis on FDI inflows to developing Asia

Developing Asia, though, has lagged behind in regional economic integration. Furthermore, the currency crisis of 1997-1998 has affected FDI inflows in the Asian region in a compounded manner. It has affected demand for FDI adversely with the slow-down of the economies and loss of investor confidence. Furthermore, a significant part of FDI inflows received by Asian countries has originated within the region with the emergence

Figure 4. Shares of developing Asia and Latin America in FDI inflows to the developing world



of new sources such as the Republic of Korea; Hong Kong, China; Taiwan Province of China; Singapore; and Malaysia. The crisis in these countries has affected the supply of FDI flows as well. All these trends have led to a decline in the share of Asia in FDI inflows.

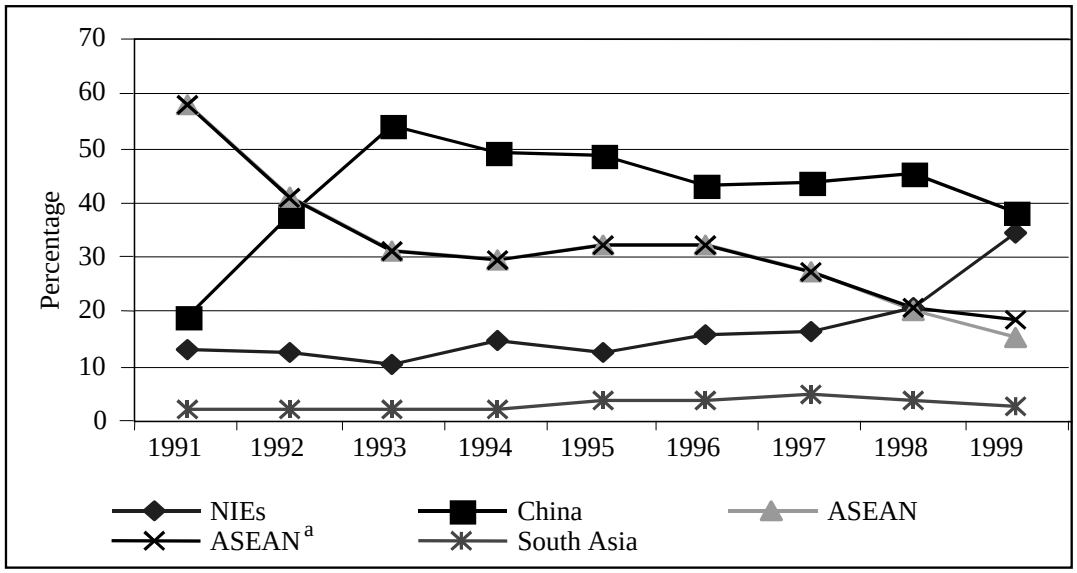
4. FDI inflows in developing Asia

Within Asia also, the relative importance of subregions is changing. Figure 5 summarizes the relative shares of subregions in FDI inflows. China dramatically improved its share from 19 per cent of inflows to the region in 1991 to 54 per cent in 1993. Since then, however, China has not been able to maintain its share of the inflows into Asia. The share of Asian NIEs, i.e. Hong Kong, China; Taiwan Province of China; and the Republic of Korea, fluctuated at around 14 per cent up to 1997. It rose sharply over 1998-1999, largely owing to heavy cross-border M&A activity in the Republic of Korea, after the Asian crisis. ASEAN countries, particularly Singapore, Malaysia, Thailand, Indonesia and the Philippines, have been popular hosts to FDI in the region. Viet Nam has also become an increasingly important host following its integration with ASEAN. The region initially lost its share largely owing to the emergence of China. During the 1994-1996 period, ASEAN countries improved their share in Asian inflows. Since 1997, they have lost their share owing to the crisis of 1997. In particular, there has been disinvestment in Indonesia for the past two years in a row. South Asia, comprising some of the poorest countries in the region, has been a marginal host to FDI inflows. The region is facing a further marginalization as a host to FDI inflows since 1998 even though it was spared from the direct effect of the currency crisis.

5. Growing marginalization of poorer countries

The shares of the region also tend to mask the intercountry variations in relative importance as hosts to FDI. FDI inflows are highly concentrated in a handful of high- and middle-

Figure 5. Shares of subregions in FDI inflows into developing Asia



[a] Excluding disinvestments in Indonesia during 1998 and 1999.

income countries. Low-income and least developed countries remain marginalized in the distribution of FDI inflows. The share of 45 least developed countries as a group in global FDI inflows is negligible at half a percentage point and showed a declining trend over the period 1991-1999 (figure 6). Just ten most important hosts of FDI among developing countries account for over 80 per cent of all inflows received by developing countries in 1999. The concentration in top ten recipients has increased from 66 per cent in the mid-1980s to over 80 per cent in late 1990s.

6. Emerging sources of outflows

An important development of 1990s has been the rise of emerging sources of FDI in Asia such as Hong Kong, China; Taiwan Province of China; Singapore; China; the Republic of Korea; and Malaysia (table 3). These countries accounted for nearly 15 per cent of global outflows in the mid-1990s. Since then, their share has declined, largely because of the economic crisis of 1997. The bulk of emerging country FDI outflows are absorbed within the region. The European Union has emerged as the most formidable source of FDI outflows with a 64 per cent share (figure 7). However, the bulk of the outflows originating in the European Union are also absorbed within the region itself. The other notable trend is the decline in Japan's relative importance as a source of FDI, from nearly 15 per cent on average during 1988-1993 to less than 3 per cent in 1999. This is because of the continuing recession in Japan and the depreciation of the yen over the past few years, which has reduced the need of Japanese corporations to relocate production.

The sectoral composition of FDI outflows is steadily changing in favour of services, which accounted for 53 per cent of FDI outflows in the mid-1990s compared with 43 per cent a decade before. The share of the primary sector in FDI flows is fast declining. Industry still accounts for 37 per cent (table 4).

7. Prospects for expansion of FDI inflows to low-income and least developed countries

The expanding magnitude of FDI inflows tends to create optimism among poorer countries concerning the potential of these inflows to expedite

Figure 6. Share of least developed countries in global FDI inflows

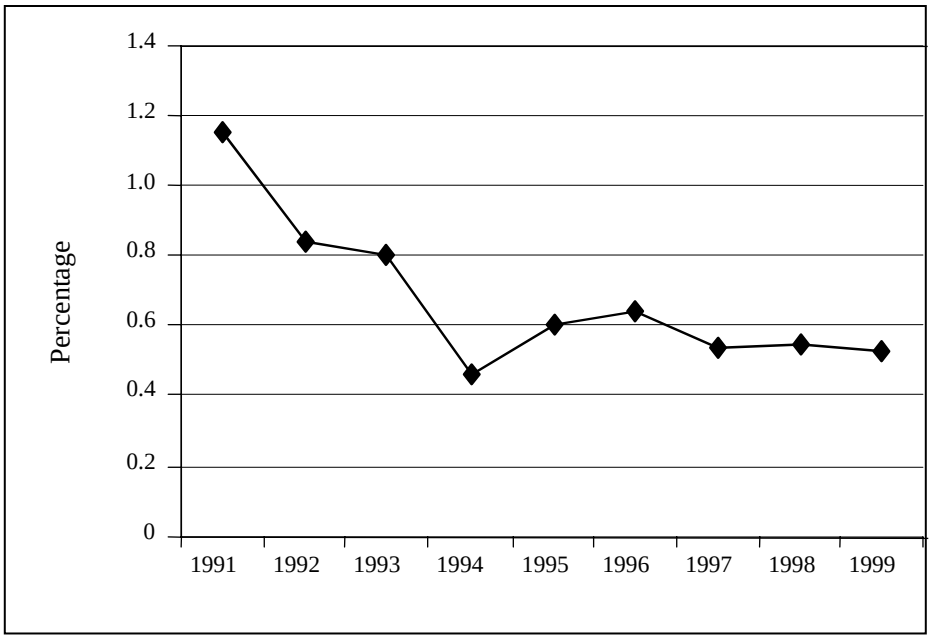


Table 3. FDI outflows, by home region and economy, 1988-1999

(Millions of US$)

	1988-1993 (annual average)	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
World	221 357	282 902	357 537	390 776	471 906	687 111	799 928
Developed countries	197 581	240 487	306 822	331 963	404 153	651 873	731 765
European Union	107 220	120 684	158 990	182 226	223 662	425 495	509 824
Share of European Union	48.438	42.6593	44.4681	46.632	47.395	61.925	63.734
United States	39 323	73 252	92 074	84 426	99 517	146 052	150 901
Share of United States	17.765	25.8931	25.7523	21.605	21.088	21.256	18.864
Japan	32 472	18 089	22 508	23 442	26 059	24 152	22 743
Share of Japan	14.67	6.39409	6.29529	5.9988	5.5221	3.515	2.8431
Developing countries	23 509	42 124	50 259	57 763	64 335	33 045	65 638
Percentage share in total outflows	10.62	14.89	14.057	14.782	13.633	4.8093	8.2055
South, East and South-East Asia	14 671	36 708	43 442	49 479	47 703	27 000	35 716
Percentage share of developing countries	62.406	87.1427	86.4363	85.659	74.148	81.707	54.414
Hong Kong, China	6 086	21 437	25 000	26 531	24 407	16 973	19 895
Taiwan Province of China	3 825	2 640	2 983	3 843	5 243	3 836	4 420
Singapore	1 171	4 577	6 281	6 935	8 859	-1 525	3 943
China	1 962	2 000	2 000	2 114	2 563	2 634	2 500
Republic of Korea	966	2 300	3 072	4 249	3 230	3 893	2 548
Malaysia	326	2 329	2 488	3 768	2 626	785	1 640
Thailand	132	422	835	932	367	134	368
Philippines	91	302	98	182	136	160	128
Indonesia	78	609	603	600	178	44	72
India	7	83	117	239	113	48	167

Source: Author based on UNCTAD data.

Table 4. Sectoral distribution of outward FDI stock of the largest developed home countries*

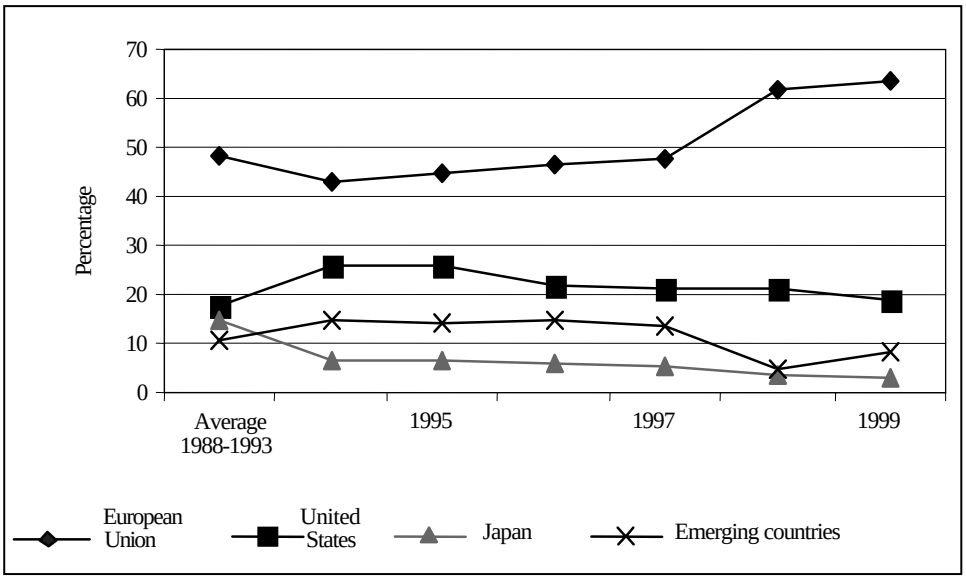
(Percentages)

Sectors	**1980**	**1985**	**1990**	**1995**
Primary	18.5	18.5	11.2	10
Secondary	43.8	38.7	38.7	37
Tertiary	37.7	42.8	50.1	53
Total	**100.0**	**100.0**	**100.0**	**100**

Source: Author based on UNCTAD and OECD data.

Note: * United States, United Kingdom of Great Britain and Northern Island, Germany, Japan, France, Canada, Italy, Australia, Netherlands, together accounting for 90 per cent of outward FDI in 1990. The 1995 figures are based on outflows for the United States, Japan, Germany, the United Kingdom and France.

Figure 7. Major home regions of FDI outflows



the process of their development. However, the 1990s saw an even greater concentration of these flows among a handful of high- and middle-income countries. A recent analysis of the determinants of intercountry variation in the FDI penetration in the host countries made within the framework of an extended model of the location of foreign production in a three-dimensional setting found that country size, level of income or development and extent of urbanization favourably affected a country's ability to attract globalized production from MNEs. The elasticity of these factors' effect on FDI inflows is greater than one, suggesting that size and income levels affect FDI inflows more than proportionately. Hence, relatively smaller, poorer and agrarian countries have their limitations in tapping the resources of MNEs for their industrialization. Availability of better infrastructure adds to the attractiveness of a country to MNEs. A competitive advantage of developing countries based on availability of low-cost labour is inadequate to prompt MNEs to locate there. Therefore, policy liberalization alone is not adequate for attracting MNEs to invest in poorer countries. The study also finds that geographical and cultural proximity between home and host countries encourages intensive investment links.

C. Foreign direct investment and patterns of efficiency-seeking industrial restructuring

The early patterns of foreign direct investment flows were shaped by the emerging protectionist tendencies in different parts of the world in the 1950s and 1960s with newly independent countries in Asia, Latin America and Africa adopting an import-substituting industrialization strategy of development. Multinational enterprises (MNEs) feeding markets in these countries responded by setting up local production facilities in response to tariff and non-tariff barriers erected by the host Governments to retain their markets. This type of FDI undertaken by MNEs to retain their markets was termed as "tariff-jumping FDI" or market-seeking FDI. MNE affiliates in each host country tended to look like miniature replicas of their parents in the sense that they served all the market segments served by their parents even though at suboptimal scales. The other type of FDI common in those times was the natural-resource-seeking FDI, i.e. undertaken to secure access to minerals and raw materials. This included MNE investments in the plantation and mining sectors in various parts of the developing world to

secure sources of supply of crucial raw materials.

A significant proportion of FDI inflows in developing countries since the 1970s have been designed to benefit from the rationalization of production across countries in accordance with international differences in factor endowments and factor costs. These investments are termed export-platform or export-oriented FDI flows and have facilitated efficiency-seeking restructuring of industries. Export-platform FDI has evidently played an important role in the rapid growth of the manufactured exports of Asian newly industrializing economies such as Taiwan Province of China; Singapore; Hong Kong, China; Malaysia; and China. However, over the years, the patterns, nature and determinants of the industrial restructuring have been changing. Two overlapping waves of industrial restructuring are discernible. One of them covered a shift of production by MNEs from their home countries to benefit from the international factor price differentials (such as low wages) for their home market-based production. The other wave has been provoked by the trends of liberalization and regional economic integration, forcing corporations to restructure and rationalize production for worldwide sourcing to achieve overall economy.

1. The first wave: industrial restructuring to exploit international factor price differentials

The early wave of industrial restructuring in the form of export-oriented production abroad by United States MNEs in the East Asian countries to take advantage of the low wage labour available there was sparked off by the Offshore Assembly Provisions in the United States Tariff Code, which have allowed duty free reimport of components exported by United States enterprises for offshore assembly under United States tariff items 9802.00.60 and 9802.00.80 since the late 1960s. The rapid appreciation of the Japanese yen since the Plaza Accord of 1985 and rising wages in Japan similarly prompted Japanese corporations to rationalize their production processes globally. The extent of relocation of production has been substantial enough to invite widespread fears of the "hollowing out" of Japanese industry.

2. The second wave: industrial restructuring in response to liberalization and regionalization

As observed earlier, the protected markets of the earlier era led to horizontal expansion of MNEs, where MNE affiliates in different national markets tended to resemble their parents, often producing the entire range of the parent company's products at suboptimal scales. The recent trend towards liberalization of trade and investment regimes worldwide, especially within the framework of regional economic integration, has sparked off a new wave of industrial restructuring that has involved a combination of a number of trends as follows:

(a) Corporate consolidation and refocusing on core competencies

Progressive liberalization of trade and investment regimes worldwide as a part of the implementation of WTO agreements is speeding up the process of globalization and industrial restructuring. As observed earlier, the rapid expansion of FDI flows over the past decade has been driven largely by the growth of cross-border mergers and acquisitions (M&As). The sharp rise in M&As, in turn, is on account of the worldwide industrial restructuring and consolidation that is taking place. For instance, the global pharmaceutical industry is consolidating with the mergers of Ciba-Gieigy and Sandoz to form Novartis, of Glaxo and Wellcome and then with Smith Kline Beecham to form Glaxo Beecham, and of Pharmacia and Upjohn among others; the automobile industry with the takeover of Rover by

BMW, the merger of Daimler-Benz and Chrysler, the takeover of Mazda and Volvo cars by Ford and so on. The M&As have been prompted by liberalized trade regimes worldwide which force enterprises to strengthen their competitiveness. Hence, factors such as economies of scale and economies of specialization assume importance. Corporations are responding by restructuring their operations to refocus on their core competencies and by strengthening their market power. For instance, Volvo of Sweden has sold its car division to Ford and bought into Scania Trucks to consolidate its hold over the commercial vehicles segment. Where full-scale M&As are not possible, strategic alliances are entered into to exploit synergies in their competencies. Like M&As, strategic alliances between corporations have also multiplied over the past decade.

(b) Global or regional product mandating/ vertical specialization

The trend towards liberalization of trade and investment regimes worldwide, especially in the framework of regional economic integration schemes, has facilitated the internal restructuring of enterprises by removing the need to maintain horizontal national operations for MNEs. Therefore, MNEs restructure their operations by assigning the responsibility for serving specific regional or even global markets in particular product lines to certain affiliates. This strategy is sometimes called product mandating and results from efficiency-seeking restructuring or specialization within the MNE (for instance, a Malaysian affiliate of Minolta corporation producing a particular range of cameras for Minolta's markets worldwide, a Brazilian affiliate of Singer producing a particular model of sewing machines for global markets, Ford of the United Kingdom producing the Escort model of cars for European Union (EU) members and neighbouring countries, and so on). This strategy helps the corporation to internalize the economies of specialization and scale by focusing attention on the production of a specific product line.

(c) Regional economic integration and industrial restructuring

Global product mandating as a strategy has been made possible by the recent trend towards liberalization of economies worldwide, especially in the framework of regional economic integration schemes such as those in the European Union and North America. This is because these schemes ensure the free movement of goods and capital between the member countries, which face common external tariffs. The restructuring has also been facilitated by a variety of preferential and free-trade agreements between countries and those extended by regional trade blocs to non-member countries.

The Single Market Plan of the European Union, for instance, has prompted extensive industrial restructuring, not only in European MNEs, but also in American and Japanese MNEs operating in the European Union to restructure their operations on a pan-European basis. The restructuring takes the form of specific subsidiaries receiving their parent's mandate for specific goods or services for the markets concerned. The product markets are given for the entire regional market or the global market in the specific product lines. For instance, Unilever now makes all its dishwasher powder meant for the European market at its Lyon (France) plant and all its soap for Europe at Port Sunlight (United Kingdom). Similarly, IBM has reorganized its operations on a pan-European basis with IBM United Kingdom looking after PCs, IBM Germany, mainframe computers and manufacturing; IBM France, telecommunications, and IBM Italy, mid-range machines. Thus, this type of restructuring enables the enterprise to exploit the economies of scale and specialization. The location for specific product mandates is chosen on the basis of the advantages a particular country

has for the particular activity. These could include factor availability and prices, agglomeration economies and other "location-bound advantages".

D. Industrial restructuring and export-oriented FDI in Asia

In the preceding analysis, a distinction was made between two waves of industrial restructuring. One has involved relocation of production by MNEs to take advantage of international differences in factor costs such as low-cost labour. The other wave covers a more profound type of restructuring of production and distribution of goods and services between subsidiaries located in different countries on a specialization in specific product lines with product mandates facilitated by liberalization. In both cases, the restructuring leads to export-oriented FDI. In the first case, subsidiaries export back to the home countries. In the second case, subsidiaries having product mandates export to third countries. The rising importance of intra-industry and intra-firm trade in the global trade is actually a reflection of this phenomenon of a new international division of labour or industrial restructuring taking place in the world economy. Trends and patterns in the export orientation of production of MNE affiliates could provide an idea of the emerging trends in industrial restructuring. In what follows, we summarize the patterns emerging from an analysis of the export orientation of affiliates of Japanese and Republic of Korea MNEs.

1. Trends in the importance of the export orientation of FDI over time

Trends in export-oriented production abroad by Japanese MNEs as summarized in Table 5 also reveal a decline in the proportion of exports in turnover over time from 52.72 per cent in 1980 to 33.72 per cent in 1992. The Plaza Accord of 1985, which led to a sharp appreciation of the yen, appeared to have motivated Japanese corporations to relocate production abroad as the share of exports in affiliate sales went up from 30.27 per cent in 1986 to 42.76 per cent in 1989. In the subsequent period, however, exports' share declined from 42.76 to 33.72 in 1992. It appears that Japanese industry improved its competitiveness by restructuring itself and that it absorbed the initial shock of yen appreciation. The evolution of flexible automation may have aided Japanese industry's effort to regain its competitiveness. As in the case of the United States MNEs, most of the decline was with respect to exports to Japan. The proportion of sales exported to the third countries actually increased

Table 5. Export orientation of overseas affiliates of Japanese MNEs, 1980-1993

Year	All countries			Developing countries		
	Exports to the home countries (% of sales)	**Exports to third countries** (% of sales)	**Total exports** (% of sales)	**Exports to the home countries** (% of sales)	**Exports to third countries** (% of sales)	**Total exports** (% of sales)
1980	35.50	17.22	52.72	25.55	22.41	47.96
1983	23.48	17.10	40.57	45.95	12.37	58.32
1986	13.83	16.44	30.27	49.07	34.06	83.14
1989	18.84	23.92	42.76	59.16	19.89	79.05
1992	14.48	19.25	33.72	66.35	8.98	75.33

Source: Kumar based on unpublished extracts from MITI's surveys on overseas activities of Japanese corporations, various years, based on affiliates reporting geographical breakdown of sales.

slightly as compared with 1980 but declined after 1989. Japanese affiliates in developing countries export a much higher proportion of their sales than affiliates in general. This proportion peaked in 1986 at 83.14 per cent and declined afterwards. It would appear that the early investments of Japanese corporations in developing countries were largely export-oriented in nature and that they focused their attention increasingly on domestic markets in the subsequent period. Unlike affiliates in general, exports to Japan of developing country affiliates increased steadily from 25.55 per cent in 1980 to 66.35 per cent in 1992. Exports to third countries have declined after 1986. This would suggest, therefore, that Japanese MNEs relocate production to developing countries mainly for labour-intensive processing for final consumption or further processing in the home country. It is also interesting to note that the third-country market-oriented FDIs of Japanese corporations were increasingly concentrated in the industrialized countries in the late 1980s and 1990s.

2. Location of export-oriented production: shifting comparative advantage

MNEs are quite selective about choosing a location for their export-oriented investments. The choice of a location is determined by a number of policy and structural factors in addition to the

Table 6. Export-orientation of Japanese affiliates in developing countries in Asia

Region/ country	1986			1992		
	Sales* (Millions of yen)	**Total exports** (% sales)	**Exports to Japan** (% sales)	**Sales*** (Millions of yen)	**Total exports** (% of sales)	**Exports to Japan** (% sales)
World total	17 601 847	30.27	13.83	49 572 421	33.72	14.48
Asia	2 887 749	54.69	19.84	8 963 860	40.61	21.81
Indonesia	97 457	9.32	2.52	668 713	28.30	17.69
Hong Kong, China	909 911	78.26	23.71	1 813 924	50.31	25.70
Singapore	567 903	57.12	21.59	2 265 257	63.99	36.75
Thailand	306 472	19.43	9.49	1 277 686	20.24	8.44
China	11 464	9.79	7.72	133 346	53.28	42.72
Malaysia	193 793	41.98	7.34	749 739	48.81	22.49
Republic of Korea	333 572	50.01	20.02	516 298	21.69	10.46
Taiwan Province of China	326 671	47.93	26.11	1 151 299	19.17	10.90
Philippines	119 066	56.08	30.00	184 934	26.75	13.19
India	20 064	6.11	0.00	152 360	5.77	0.22
Pakistan	0			40 927	0.00	0.00
Bangladesh	491	0.00	0.00	348	95.40	69.54
Sri Lanka	665	14.14	4.96	3 609	53.67	12.64
Brunei	107	68.22	21.50	2 227	0.00	0.00

Source: Kumar based on GLOB-TED database.
Note: * Sales of affiliates reporting geographical breakdown of sales.

availability of low-cost labour and skilled manpower. Hence, the intercountry distribution of export-oriented FDI inflows is highly uneven. In what follows, we examine the intercountry pattern of the export orientation of Japanese affiliates in developing countries.

The export intensities of Japanese affiliates in developing countries in 1986 and 1992 are summarized in table 6. The initial round of export-oriented investments by Japanese corporations was concentrated in East Asian countries. The export propensity pattern of Japanese enterprises across countries has changed significantly since 1986. In 1986, affiliates in East Asian NIEs, namely, Hong Kong, China; Taiwan Province of China; the Republic of Korea and Singapore, along with the Philippines, had high ratios of total as well as Japanese market-oriented exports. By 1992, the export intensities of affiliates in the East Asian NIEs had declined. The apparent reason seems to be the rising wages and currency appreciation in these countries in the late 1980s. The investments, which had been moved from Japan to the East Asian countries in the 1970s and early 1980s to take advantage of low cost-labour, were moved once again to South-East Asian and Latin American countries. Among the Asian countries, China, Malaysia and to some extent Indonesia have emerged as major hosts of export-oriented investments by Japanese MNEs. In 1992, Japanese affiliates in China exported 53.28 per cent of their sales, of which 42.73 per cent were directed to the home country compared with under 10 per cent of exports in 1986. Hence, the pattern seems to follow the footloose character of export-oriented investment.

3. Relocation of production by Republic of Korea MNEs

Like Japanese MNEs, enterprises in the East Asian newly industrializing economies have also started to use outward FDI to improve the price competitiveness of their goods, which has suffered adversely from rising wages and currency appreciation over the past 10 years, by moving their production to cheap-labour locations. Sometimes these investments are also driven by the availability of preferential access to major markets, e.g. the Mediterranean, East or Central European or Lome Convention (or ACP) countries, which enjoy preferential access to the European Union market, the loss of GSP preferences and the exhaustion of MFA quotas in the garment and textile industry. The Republic of Korea example is illustrated below.

The won tended to appreciate owing to rising current account surpluses in the late 1980s and early 1990s. The Republic of Korea's international competitiveness was further affected by rising real wages. Between 1978 and 1987 alone, the Republic of Korea's production workers' hourly wages doubled and have risen by 16 per cent a year on average in nominal terms since then. Finally, the Republic of Korea's export competitiveness was also eroded by the loss of GSP preferences in the United States market as the Republic of Korea was considered developed enough not to need trade preferences. The further expansion of the Republic of Korea's exports of footwear and apparel, etc., has been limited by the exhaustion of MFA quotas. Republic of Korea enterprises attempted to make up for these developments by relocating labour-intensive production in South-East and South Asian countries to take advantage of low-cost labour and also of GSP preferences and MFA quotas. Table 7 shows that a substantial proportion of Republic of Korea manufacturing FDI in the South-East Asian countries and some South Asian countries such as Bangladesh and Sri Lanka has been in export-oriented labour-intensive industries such as textiles and garments and footwear and leather goods. This suggests that Republic of Korea enterprises have used these countries as export platforms for relocating these industries for availability of cheap labour, GSP benefits and, often also, unfilled MFA quotas. Korean companies are also setting up plants

Table 7. Sectoral distribution of overseas FDI of the Republic of Korea in selected Asian countries, end - 1994

(Thousand of US$)

Sectors Host countries	All industries	Manufacturing	Textiles and clothing	Leather and footwear
Philippines	159 889	153 549	29 426 (19)	9 843 (6)
China	1 104 924	996 079	143 386 (14)	102 090 (10)
Indonesia	824 588	445 894	69 354 (16)	37 936 (9)
Viet Nam	133 918	116 391	23 598 (20)	10 233 (9)
Sri Lanka	82 446	82 111	43 831 (53)	1 815 (2)
Bangladesh	34 523	34 498	19 101 (55)	1 075 (3)
All countries	**7 648 792**	**4 191 101**	**545 517 (13)**	**210 107 (5)**

Source: Kumar.
Note: Figures in parentheses are percentage shares in manufacturing totals.

in Eastern European and Mediterranean countries, which combine the benefit of relatively cheaper wages with preferential access to European Union markets. For instance, Samsung has invested in Hungary; Daewoo has invested in a US$ 759 million car factory in Craiora, Romania and a television and microwave oven plant in Poland and has plans to enter other East European countries; and Goldstar has invested in Turkey.

4. Industry pattern in export-oriented production

The tendency to restructure production internationally is expected to vary across industries depending upon factors such as labour intensity, skill intensity and technical feasibility of fragmentation of production. It is expected to be high in parts-intensive industries such as electrical and general machinery. The industry pattern of the export orientation of Japanese affiliates for the period 1980-1992 is summarized in table 8. The export orientation of manufacturing affiliates declined between 1980 and 1989 but has marginally risen since then. Japanese affiliates in natural resources and raw materials intensive industries such as food products, textiles, wood and pulp products, non-ferrous metals and chemicals are more export-oriented than those in other industries owing to the poor natural resource base of the Japanese economy. The export intensities of affiliates in food products, wood and pulp, chemicals and non-ferrous metal products have tended to decline, especially since 1986. In the case of textiles and chemicals, the export intensities rose in the period 1980-1986, declined between 1986 and 1989 and have risen again since 1989. The export orientation of affiliates in electrical and non-electrical machinery industries has risen, especially since 1986. It is mainly in these industries that Japanese corporations compete in the global market and the need to strengthen competitiveness is important. Therefore, the appreciation of yen since 1985

Table 8. Industrial pattern of the export orientation of Japanese affiliates

Industry	1980		1986		1989		1992	
	Total exports (% sales)	Exports to Japan (% sales)	Total exports (% sales)	Exports to Japan (% sales)	Total exports (% sales)	Exports to Japan (% sales)	Total exports (% sales)	Exports to Japan (% sales)
All industries	52.72	35.50	30.27	13.83	42.76	18.84	33.72	14.48
Manufacturing	27.07	10.92	22.92	7.80	20.35	7.94	23.33	6.31
Food	53.44	26.93	43.70	21.20	29.15	22.20	36.33	20.83
Textiles	32.29	3.47	50.07	9.13	28.90	12.85	41.49	11.34
Wood and pulp	73.69	47.12	77.00	46.97	62.23	37.84	52.31	32.47
Chemicals	21.65	9.83	28.57	11.95	21.81	9.98	35.55	4.89
Iron and steel	17.46	6.44	13.04	2.72	3.73	1.16	4.24	0.84
Non-ferrous metals	39.87	22.11	63.69	32.29	28.85	14.30	32.34	18.13
Non-electrical machinery	17.62	2.39	20.32	4.31	25.31	5.11	27.67	4.19
Electrical machinery	21.31	6.57	14.44	5.36	23.89	8.33	39.35	9.27
Transport equipment	4.99	0.73	18.79	4.16	8.06	2.65	5.91	1.37
Other manufacturing	39.65	21.37	36.40	11.52	20.09	6.81	21.06	7.32
Non-manu-facturing	58.10	40.65	33.83	16.76	50.97	22.83	39.28	18.85
Trading	58.77	41.13	33.15	16.26	50.51	23.58	39.72	19.45
Services	7.87	7.37	11.06	5.08	20.24	9.59	4.88	3.75
Other Non-manufacturing	38.59	26.67	54.65	31.10	60.54	15.82	42.66	12.64

Source: Kumar based on GLOB-TED database.

seems to have pushed Japanese corporations to move production abroad. In both cases, exports to Japan constitute a rather small proportion of the export ratios of affiliates. The production has apparently been moved abroad mainly to cater for global markets. In the transport equipment industry too, Japanese corporations are major global competitors. In this industry, however, the export intensities are rather small and have declined since 1986. It would appear that the international competitiveness of the Japanese transport equipment industry is sustained by local assembly in the final markets. Hence, affiliates show low export intensity. This has been attributed to low export orientation for transport machinery, import protection and local content regulations applied to the sector in a number of countries.

5. Factors shaping the locational patterns of export-oriented FDI or industrial restructuring

This section draws upon our recent attempt to empirically analyse the determinants of export-platform production by United States and Japanese MNEs using an analytical framework that

distinguishes the destination of exports. The analytical framework emphasizes the role of a number of geopolitical and strategic factors in shaping the locational pattern of export platform production, in addition to the structural and policy characteristics of the host countries. This framework was then used to analyse the determinants of export-oriented production by United States and Japanese corporations abroad with the GLOB-TED, database which allows us to capture three dimensions in the analysis, i.e. 74 host countries, seven broad branches of manufacturing and three points of time over the period 1982-1994.

The findings of the study suggest that the home-market-oriented offshore production by both United States and Japanese MNEs has been concentrated in countries that are able to offer a low-cost but educated workforce, good infrastructure and trading facilities. Countries sharing border with the home country or situated geographically closer have enjoyed an edge over others. In addition, countries that have privileged or preferential access to the home market under a regional customs union such as NAFTA members in the case of the United States market or a preferential trading arrangement such as the Caribbean Basin Initiative also in the case of the United States have been preferred. The third country market-oriented exports of United States and Japanese affiliates were found to have been influenced more by strategic and geopolitical factors than factor-cost considerations. Countries participating in regional trading blocs (European Union member States for affiliates from both the home countries and NAFTA for third country orientation of Japanese affiliates) enjoyed a definite edge over others in attracting this type of offshore production.

Policy factors also affect the attractiveness of the two types of export-platform production differently. Third country market-oriented production requires a more liberal trading regime than home-market-oriented production. Hence, liberalization of the trade regime may help countries to attract rest-of-the-world market-oriented production from MNEs provided that other conditions such as strategic access to markets are present. Setting up more export processing zones as a tool of policy might help host countries to attract only home-market-oriented FDI inflows but not the third country-oriented production. The latter, however, is more sensitive to the quality of the available infrastructure than home-market-oriented manufacture. Because saturating its host country markets before exporting would be the most natural response of an affiliate, even having a product mandate, the size of the host country's domestic markets has an inverse relationship with the third country export-orientation of affiliates. However, export commitments imposed by host Governments at the time of entry appear to have been an effective means of pushing MNEs to export more from countries with relatively larger domestic markets.

Regional economic integration therefore emerges as an increasingly important factor in shaping the global pattern of investment, production and trade. The fear of protectionism and discrimination against extraregional supplies is driving foreign MNEs to localize production within custom unions. This suggests that participation in regional economic integration schemes might increase developing countries' chances of attracting export-platform production from MNEs.

6. Flying-geese pattern of shifting comparative advantages in Asia

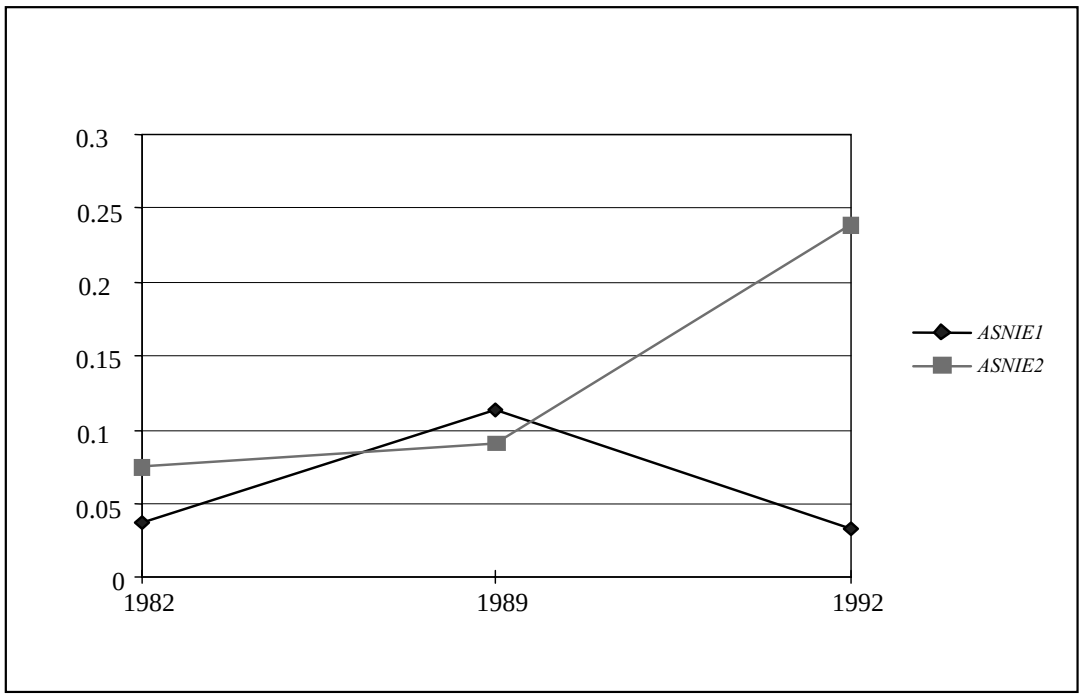
East and South-East Asian economies are known to have been particularly successful in attracting export-platform investments from MNEs and in expanding their manufactured exports rapidly over the past two decades. This could be explained by the availability of a relatively cheap and educated workforce, favourable policy

environment and other related factors. These countries have been classified into two groups, one representing the first generation of NIEs, i.e. the Republic of Korea; Taiwan Province of China; Hong Kong, China; and Singapore (*ASNIE1*) and the second including the fast-growing economies of Thailand, Indonesia, Malaysia, the Philippines and China (*ASNIE2*). The analysis also took note of the possible dynamic element in the special advantage of these countries. The first generation of NIEs have experienced sustained appreciation of their currencies, labour scarcity and loss of Generalized System of Preferences (GSP) benefits and quotas under the Multifibre Agreement (MFA) since the mid-1980s and have emerged as important sources of outward FDI, including export-oriented FDI. For that reason, they may be disadvantaged as hosts of export-oriented FDI, especially in the more recent period. The second tier of NIEs, however, have recently emerged as important hosts of export-oriented FDI, as seen above.

The findings suggest that the first generation of Asian NIEs were tapped by Japanese MNEs for home-market-oriented production significantly in the period following the Plaza Accord of 1985. However, by 1992 they had lost their competitiveness as attractive locations for home-market-oriented processing by MNEs. This tends to corroborate the prediction in the light of trends observed earlier such as rising wages, appreciating currencies, and loss of GSP benefits and MFA quotas. The impact of these trends on the East Asian economies has been so significant that their national enterprises are globalizing production and have themselves become significant sources of export-oriented FDI over the past decade.

The second-tier Asian NIEs, however, have emerged as increasingly important hosts for home-market-oriented production by Japanese MNEs with their significant positive effect and increasing magnitudes of the coefficients over time. Figure 8 shows the changing magnitudes of the special advantages of Asian NIEs in a graphic manner. This tends to confirm the footloose nature of export-platform production by MNEs, which moves from place to place on the basis of changing comparative

Figure 8. Coefficients of special advantages of Asian NIEs



advantage. The literature has emphasized the flying-geese pattern of the location of export-platform production, where new countries fill the space vacated by others.

This characterization would create hopes for South Asian countries as probable locations for export-platform production by Japanese companies after saturation of the South-East Asian (or *ASNIE2*) countries. However, the recent economic turmoil in East Asia has upset those hopes. Because of steep devaluations of the currencies of the East Asian countries, the need to relocate production in order to regain competitiveness h1as diminished.

E. Regional economic integration and industrial restructuring in South-East and South Asia

Asian developing countries made a number of attempts at regional economic cooperation in the 1970s at the initiative of ESCAP. These included the Bangkok Agreement in 1975 which covered the exchange of tariff concessions between five members, namely, Bangladesh, India, the Lao People's Democratic Republic, the Republic of Korea and Sri Lanka. The Asian Clearing Union with seven members in the region, Bangladesh, India, the Islamic Republic of Iran, Myanmar, Nepal, Pakistan and Sri Lanka, came into being in 1974. It is generally agreed, however, that these early experiences have not been very successful. The reasons for the results not living up to expectations have been varied. For instance, the Bangkok Agreement has suffered from its limited membership as well as the products covered, preference margins not being deep enough and its scope not extending to non-tariff barriers.

Successful experiences with regional economic integration in the industrialized countries since the mid-1980s in Europe and North America have also prompted South-East and South Asian countries to adopt economic integration strategies. For instance, although set up in 1967, ASEAN had limited cooperation in economic areas until 1992, when it decided to set up the ASEAN Free Trade Area. Similarly, SAARC came into being in 1985 but it adopted a programme of economic cooperation on its agenda only in 1991 with the formation of the Committee for Economic Cooperation (CEC). It has since created a SAARC Preferential Trading Arrangement (SAPTA) in 1995 and plans to create a South Asian Free Trade Area. In addition to regional economic integration, bilateral free trade agreements between India and Nepal and between India and Sri Lanka have also sped up economic integration in the region. Although the attempts at economic integration in South-East and South Asia are of relatively recent origin, they have already provoked a trend of industrial restructuring in these regions as summarized below.

1. Regional economic integration and industrial restructuring in South-East Asia

The decision taken during the Fourth ASEAN Summit in 1992 to establish the ASEAN Free Trade Area (AFTA) by the year 2008 is the most significant and ambitious step taken by ASEAN so far in terms of regional economic integration. The AFTA Treaty was signed in Singapore by Brunei Darussalam and the five original founding members (Indonesia, Malaysia, the Philippines, Singapore and Thailand). In mid-1995, Viet Nam gained admission as the seventh member of ASEAN. The Lao People's Democratic Republic and Myanmar followed suit two years later in 1997, and Cambodia joined it in 1999. AFTA provides a framework and forum for ASEAN members to move towards deeper economic integration between themselves and also with the world. By facilitating the free flow of goods within the ASEAN region, AFTA is expected to promote a greater degree of market integration.

The main mechanism for the implementation of AFTA is the Common Effective Preferential Tariff (CEPT). The CEPT is an agreed effective tariff which is preferential to ASEAN economies and is to be applied to domestically produced goods that have been identified for inclusion under the CEPT scheme. The original schedule required the CEPT tariffs to be reduced to between 0-5 per cent within 15 years, i.e. by 2008, while non-tariff barriers were to be eliminated beginning on 1 January 1993. In September 1994, ASEAN agreed to accelerate the establishment of AFTA by reducing the initial time frame from 15 to 10 years. Under the 1994 amended timetable, the full realization of AFTA with tariffs falling between zero and 5 per cent was expected by the year 2003 for the original ASEAN five, Indonesia, Malaysia, Thailand, Singapore and the Philippines, as well as Brunei Darussalam. The deadline for Viet Nam was 2006 and for Myanmar and the Lao People's Democratic Republic, 2008. To facilitate recovery from the economic crisis of 1997, the ASEAN members announced a further advancement of the AFTA schedule in December 1998 for the six original signatories by one year from 2003 to 2002. The six also agreed to achieve a minimum of 90 per cent of their total tariff lines with tariffs between 0 and 5 per cent by the year 2000. In theory, this would account for 90 per cent of intra-ASEAN trade.

Tariff reductions under the CEPT scheme alone may not be sufficient to enhance intra-ASEAN trade if other non-tariff barriers (NTBs) remain in place. This is because the existence of NTBs may limit or perhaps negate the trade-liberalizing effect of the CEPT mechanism. To address this issue, articles 5.A.1 and 5.A.2 of the CEPT Agreement call on member countries to eliminate quantitative restrictions with respect to products under the CEPT scheme in addition to other non-tariff barriers on a gradual basis within a period of five years.

Furthermore, ASEAN has complemented the formation of AFTA with other initiatives to facilitate intra-regional trade and speed up industrial restructuring. These include harmonization of customs procedures and standards. ASEAN targeted 2002 for the adoption of an ASEAN Harmonized Tariff Nomenclature and brought forward the adoption of the WTO Valuation Agreement (WVA) to 2000. ASEAN is developing product-specific mutual recognition arrangements (MRAs) for cosmetics, pharmaceutical, electrical and telecommunication products, among others. ASEAN is also harmonizing national standards with international standards such as those of the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC) and the International Telecommunication Union (ITU) for 20 priority product groups which are some of the most widely traded in the region, such as radios, televisions, refrigerators, air-conditioners and telephones.

AFTA has also been complemented by other initiatives to facilitate the movement of capital. Two of the most important are the ASEAN Industrial Cooperation Scheme (AICO) and the ASEAN Investment Area (AIA).

(a) ASEAN Industrial Cooperation

To facilitate efficiency-seeking industrial restructuring within the region, the Basic Agreement on the ASEAN Industrial Cooperation Scheme was signed in 1996. For companies in the AICO Scheme, the ASEAN market is almost fully integrated. In AICO, goods produced by and traded between companies operating in two or more ASEAN countries enjoy full AFTA treatment immediately, i.e. 0-5 per cent tariffs. Therefore, participating companies could benefit from economies of scale by restructuring across the region to take advantage of preferential tariff rates. In the context of the economic crisis, the eligibility

criteria for AICO benefits were relaxed at the ASEAN Summits in 1998 and in 1999.

(b) ASEAN Investment Area

The Framework Agreement on the AIA was signed in 1998. The AIA programme calls for opening up all industries in the region to ASEAN investors and granting national treatment to them (except those on temporary-exclusion lists). AIA promotes the inflow of FDI into and within ASEAN by making the region an open, liberal and competitive investment area. The core of the AIA programme involves greater investment liberalization and facilitation in ASEAN manufacturing and agriculture, fishery, forestry and mining sectors and in services related to these sectors. The "ASEAN investor" for the purpose of according national treatment has been defined very liberally and would allow a number of foreign joint ventures to qualify for favourable treatment. ASEAN is actively promoting the region as a single investment site and has started sending joint investment promotion missions to Japan and the United States.

2. AFTA and industrial restructuring

It may be too early to evaluate the impact of AFTA and complementary economic integration measures taken by ASEAN such as AICO and AIA on the process of industrial restructuring within the region. However, some indicators that are available suggest that the process has been started.

Even though the provisions of AFTA have yet to be implemented fully, since its inception in 1993 there has been a marked increase in intra-ASEAN trade. Total intra-ASEAN trade as a percentage of the Association's total trade increased from 17.6 per cent in 1992 to 21.2 over 1992-1997. However, the intra-ASEAN export share rose from 21.4 per cent in 1993 to 25.4 per cent in 1997. It declined to 22.7 per cent in 1998 because of the economic crisis and shrinking demand in the region as a result of it (figure 9). To some extent, intra-ASEAN trade represents entrepôt trade between Singapore and its neighbouring countries particularly Malaysia, and partly represents mutual trade in mineral oil. Neverhteless, there is no doubt that AFTA has started to facilitate the intraregional trade of ASEAN countries.

In addition to improving intraregional trade, AFTA and complementary investment-promoting policies such as AICO and AIA have already started to facilitate the process of efficiency-seeking industrial restructuring in the region. Intraregional investments in the ASEAN region have shown an upward trend since 1993 in terms of both numbers and value, except for a decline since 1998 on account of the economic crisis (figure 10). Apparently, AICO arrangements have already attracted the participation of many Japanese automotive manufacturers taking advantage of the particular strengths of each ASEAN country. A Japanese conglomerate operating in several ASEAN countries has estimated that it would save at least 6 billion yen over a five-year period using the AICO scheme. As many as 63 AICO arrangements generating more than US$ 700 million in trade transactions per year are already operational.

3. Regional economic integration and restructuring in South Asia

South Asia is a relatively new entrant in economic integration. The process of economic cooperation was institutionalized as a part of the SAARC agenda only in 1991 with the formation of the Committee for Economic Cooperation. A SAARC Preferential Trading Arrangement (SAPTA) came into being in December 1995 two years ahead of schedule. Under SAPTA, three rounds of trade negotiations have been concluded by the member States covering the exchange of 5,550 tariff concessions. The SAPTA process has

Figure 9. Proportion of intraregional exports in total exports of ASEAN

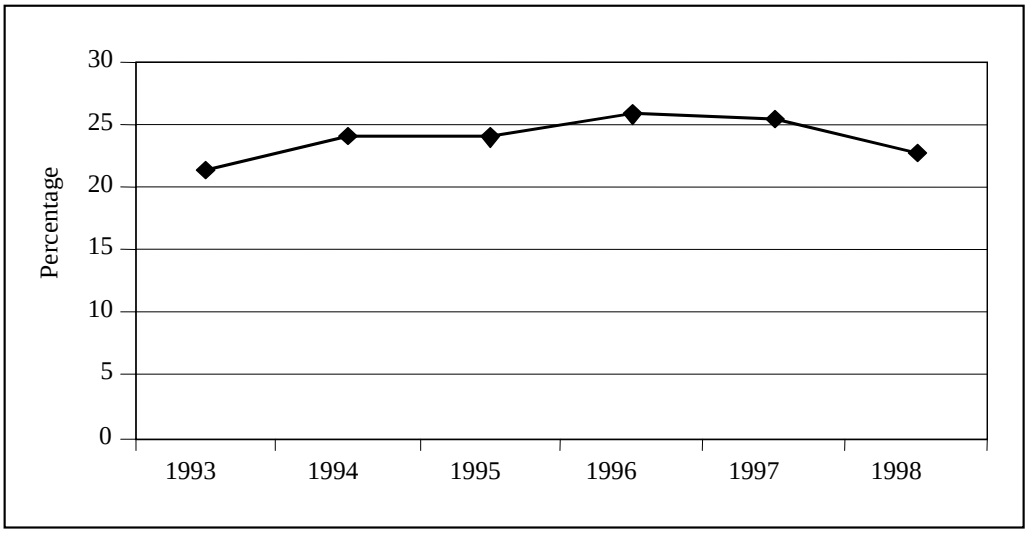
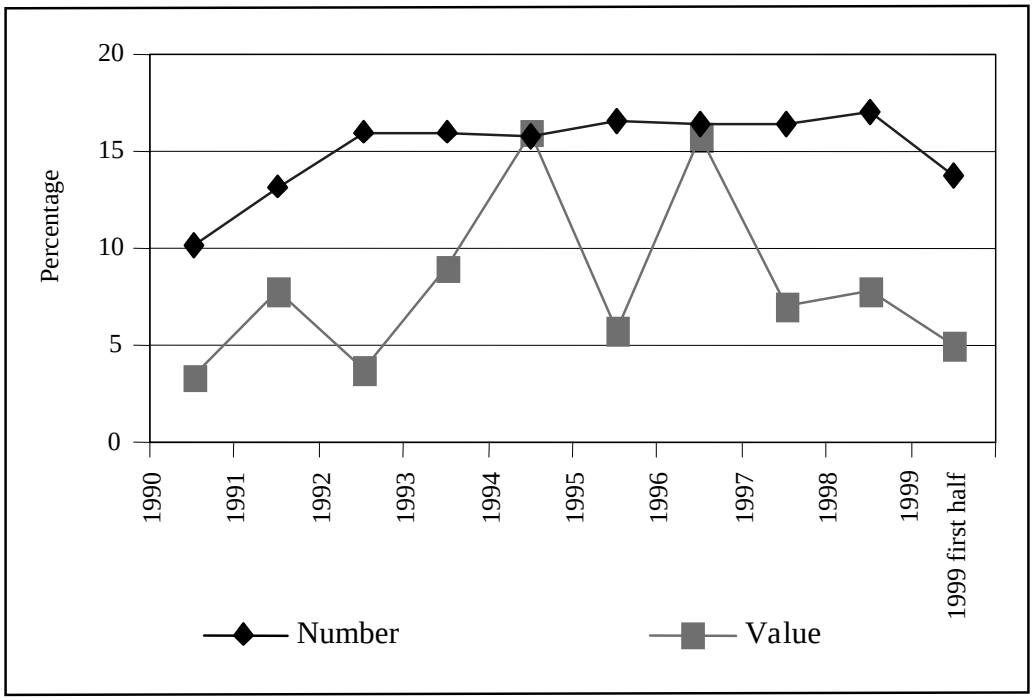


Figure 10. Proportion of intraregional projects in FDI-based projects in ASEAN manufacturing



Source: Author based on ASEAN Secretariat figures.

been envisaged to be a transition towards the eventual goal of a South Asian Free Trade Area (SAFTA). A Committee of Experts has already been working on the draft of the SAFTA treaty since July 1999. SAARC has also initiated action on a series of practical measures to facilitate the process of economic integration in such areas as customs, standards and arbitration. A Customs Action Plan providing for the harmonization of customs procedures and practices was adopted in 1997. A regional investment (promotion and protection) agreement is under consideration to create favourable conditions for promoting and protecting investments in member States. A SAARC arbitration council, a regional agreement for the avoidance of double taxation, and a regional action plan on standards, quality control and measurement have also been proposed.

Regional economic integration in South Asia has received a fresh impetus from the bilateral free trade agreements concluded by India, the largest economy in the region, with Sri Lanka in December 1998, which became functional in March 2000. India already has a bilateral free trade agreement with Nepal and has proposed one with Bangladesh. In order to give a fillip to intraregional investments, the Indian Government increased the limit for outward investments by Indian companies in SAARC countries for automatic approval to US$ 30 million from US$ 15 million for all countries.

Since the process of intraregional trade liberalization in SAARC started only in December 1995, it may be too early to assess the impact on intraregional trade. The trends suggest a steady increase in the proportion of intraregional trade over the 1990s. The proportion of the region in intra-SAARC exports as a proportion of total SAARC exports increased from 3.16 per cent in 1990 to 4.90 per cent in 1999. Intra-SAARC imports as a proportion of total SAARC imports increased from 1.91 per cent in 1990 to 4.12 per cent in 1999 (table 9). Since at present intraregional economic integration is limited to a preferential trade agreement for selected commodities, it is not expected to unleash widespread industrial restructuring. However, the India-Nepal and India-Sri Lanka free trade agreements seem to have ignited a modest trend of industrial restructuring, as summarized below.

(a) India-Nepal bilateral free trade arrangement and industrial restructuring

Indo-Nepal economic relations are governed by the bilateral treaties of trade and transit and Agreement on Cooperation to Control Unauthorized Trade. The trade treaty with Nepal was amended in 1996 and allows exports of goods manufactured in Nepal to India free of customs duty and quantitative restrictions, except for alcohol, tobacco and cosmetics. This free trade regime has facilitated restructuring of production by certain companies by shifting production bases in Nepal to serve the North Indian market as well as for third country exports. Indian companies run 72 of 214 foreign ventures in Nepal, accounting for 53 per cent of the capital of all foreign ventures (table 10).

Some interesting instances of efficiency-seeking restructuring of production locations have come to light. For instance, Colgate-Palmolive India Ltd. (a subsidiary of Colgate-Palmolive Company) has set up a venture in Nepal with authorized capital of Rs 540 million for the production of 12,000 tons of toothpaste per annum and tooth powder to feed its markets for the products in North India. As a result, toothpaste exports from Nepal to India grew from US$ 11 million in 1997-1998 to about US$ 61 million in 1998-1999, making toothpaste one of the most important items in Nepal's exports to India. Other companies are following suit. For instance, Dabur India, a domestic Indian group, has invested in a fruit-processing plant to produce and package fruit juices for the Indian market. Dabur's principal focus is ayurvedic and herbal medicinal

Table 9. Intraregional exports among SAARC countries, 1980-1999

(Millions of US$)

Origin/destination		Bangladesh	India	Nepal	Pakistan	Sri Lanka	Total SAARC	World
Bangladesh	1980		8.0	1.0	55.0	5.0	69.0	790.0
			(1.01)	(0.33)	(6.96)	(0.63)	(8.73)	
	1998		55.0	18.0	29.0	1.0	103.0	3 822.0
			(1.44)	(0.47)	(0.76)	(0.03)	(2.69)	
	1999		48.0	7.0	27.0	4.0	86.0	4 531.0
			(1.06)	(0.15)	(0.60)	(0.09)	(1.90)	
India	1980	106.0		95.0	2.0	101.0	307.0	8 441.0
		(1.26)		(1.13)	(0.02)	(1.20)	(3.64)	
	1998	1 038.0		324.0	137.0	534.0	2 033.0	36 674.0
		(2.83)		(0.88)	(0.37)	(1.46)	(5.54)	
	1999	1 063.0		342.0	141.0	564.0	2 110.0	39 077.0
		(2.72)		(0.88)	(0.36)	(1.44)	(5.40)	
Nepal	1980	1.0	19.0		4.0	0.4	24.4	63.0
		(1.59)	(30.16)		(6.35)	(0.63)	(38.73)	
	1998*	10.0	1.0		1.0	5.0	81.0	394.0
		(2.54)	(16.50)		(0.25)	(1.27)	(20.56)	
	1999	-	-	-	-	-	-	-
Pakistan	1980	55.0	71.0	0.4		39.0	165.4	2 618.0
		(2.10)	(2.71)	(0.02)		(1.49)	(6.32)	
	1998	107.0	203.0			95.0	405.0	8 433.0
		(1.27)	(2.41)			(1.13)	(4.80)	
	1999	113.0	145.0			100.0	358.0	8 331.0
		(0.88)	(1.74)			(1.20)	(4.30)	
Sri Lanka	1980	4.0	34.0		34.0		72.0	1 039.0
		(0.38)	(3.27)		(3.27)		(6.93)	
	1998	6.0	46.0		31.0		83.0	4 399.0
		(0.14)	(1.05)		(0.70)		(1.89)	
	1999	7.0	49.0		32.0		88.0	4 370.0
		(0.16)	(1.12)		(0.73)		(2.01)	
Total	1980	166.0	132.0	96.4	95.0	145.4	637.8	12 951.0
		(1.28)	(1.02)	(0.74)	(0.73)	(1.12)	(4.92)	
	1998	1 161.0	305.0	342.0	198.0	635.0	2 705.0	53 722.0
		(2.16)	(0.57)	(0.64)	(0.37)	(1.18)	(5.04)	
	1999	1 183.0	242.0	349.0	200.0	668.0	2 642.0	56 309.0
		(2.10)	(0.43)	(0.62)	(0.36)	(1.19)	(4.69)	

Source: IMF, *Direction of Trade Statistics Yearbook, 1986* and *1998* and Quarterly, March 2000.

Notes: i) Figures in parentheses represent percentage shares of total.

ii) * Data for 1997.

Table 10. Foreign ventures in Nepal as of 1 January 1999

	Number	Authorized capital (Millions of rupees)
All operating foreign ventures	214	22 800
Ventures with Indian participation	72	12 048
Share of Indian ventures	34	53

Source: Based on FNCCI.

preparations. It has also started using its Nepal venture for these preparations. Dabur Nepal was apparently contributing as much as 15 per cent of Nepal's exports to India. Kodak Nepal, a venture of Kodak India and Eastman Kodak, was planning to service the North Indian market from its Nepalese base. The free trading regime between the two countries has also encouraged Indian companies to shift production in other industries such as garments and textiles to take advantage of Nepal's unutilized MFA quotas. As many as 14 of 72 ventures operated by Indian companies in Nepal are engaged in the textiles and ready-made garments industry. There is also growing trade between India and Nepal in hydroelectric power.

(b) India-Sri Lanka free trade agreement and industrial restructuring

Under the India-Sri Lanka Free Trade Agreement, India and Sri Lanka have exchanged a list of products which will be traded freely without duty between them and have specified items for which tariffs will be phased out over a specified period. India has offered to eliminate duties on 1,000 items immediately. Tariffs on textiles and all other products would be reduced by 50 per cent except on products in the negative list of imports. The preference margin on the items offered 50 per cent concession would be increased to 10 per cent in two stages within three years of the Agreement coming into force. Sri Lanka also indicated a list of products on which zero duty would be applicable upon the Agreement's entry into force, as well as items on which a 50 per cent margin of preference would be applicable immediately and which would be deepened to 100 per cent in a phased manner in three years. India had also unilaterally removed non-tariff barriers (NTBs) on 2,000 items of imports from South Asian countries. India and Sri Lanka have also exchanged tariff preferences in the framework of SAPTA. Studies have shown that Sri Lankan exports to India have benefited most from the SAPTA preferences and the NTBs removal among the SAARC countries.

It is too early to expect a significant impact by the bilateral free trade agreement on industrial restructuring as the Agreement came into being only in March 2000. However, there are indications that it has stimulated industry in both countries to exploit its potential for efficiency-seeking industrial restructuring. The Confederation of Indian Industry (CII) and Ceylon Chamber of Commerce (CCC) exchanged high-powered delegations in March 1999, May 2000, August 2000 and December 2000 to explore the opportunities presented by the new regime for joint ventures and trade. Sri Lanka is already host to about 90 Indian ventures with a total investment of US$ 109 million. Most of these ventures were essentially domestic-market-seeking, e.g. in light engineering, goods, automobiles and hotels. However, the current trade liberalization regime has paved the way for efficiency-seeking restructuring between the two countries. Examples include the Indian tyre company Ceat India Ltd., which has set up two joint

ventures for the production of automotive tyres in Sri Lanka for supplying the markets in all of South Asia and beyond. The abundance of natural rubber at cheaper rates in Sri Lanka provides a competitive advantage. These ventures apparently have already started exporting Sri Lanka-made tyres using the Indian company's brand names to Pakistan, Bangladesh, Nepal, Mauritius and South America and are becoming popular in the domestic market. The success of the venture has prompted the joint venture partners to undertake expansion of the capacity and the range of tyres produced. Another example is of an Indian tea company, Tata Tea Ltd., which has invested in existing tea plantations in Sri Lanka. Having acquired a large British tea company, i.e. Tetley and its global brands in 1999, Tata Tea is restructuring its operations worldwide and plans to integrate its Sri Lankan production bases into its global sourcing strategies.

The above examples are but illustrative of the potential for restructuring that exists owing to efficiency-seeking restructuring in South Asia facilitated by the rather limited regional economic integration that has been undertaken in South Asia. The scale of efficiency-seeking restructuring that could be provoked and facilitated by full-pledged regional economic integration covering a free trade area complemented by a customs union and free mobility of capital could be immense. Such restructuring could allow the fullest exploitation of the synergy and location-specific advantages of each of the countries in the region. This in turn will boost the international competitiveness of the region not only for its goods and services but also as a host of FDI.

F. Conclusion

The dramatic expansion of FDI inflows over the 1990s has generated a great deal of optimism among developing countries with regard to sharing the benefits of deeper integration into the world economy by playing host to FDI inflows. However, the emerging patterns of FDI inflows as reviewed above suggest that the FDI boom has been fuelled by cross-border M&As among MNEs of industrialized countries as a part of the current wave of corporate consolidation and restructuring. FDI inflows are today even more concentrated in a handful of high- and middle-income countries and the poorest countries are becoming marginalized in the global distribution of FDI inflows. The share of developing countries particularly in Asia in FDI inflows has declined. The economic crisis of 1997 is partly responsible for the declining share of developing Asia. Regional economic integration has also become an important factor in determining the pattern of FDI inflows. The rather slow progress of the process of regional economic integration in Asia compared with other regions is also responsible for the declining share of the region in FDI inflows. South Asia, comprising some of the poorest economies in the region, is also increasingly marginalized in the distribution of FDI inflows. The prospects for poorer countries such as those in South Asia for FDI inflows do not seem bright in the light of the findings of empirical studies on determinants that bring out the importance of market size and income levels, levels of urbanization and quality of infrastructure, among other factors. Policy liberalization, therefore, has limitations in expanding FDI inflows to poorer developing countries.

FDI has also emerged as an important agent of efficiency-seeking restructuring of industry across countries. Two waves of industrial restructuring have been distinguished. The Plaza Accord and growing labour scarcity in Japan provoked the early industrial restructuring in Asia. In order to regain their lost competitiveness, Japanese corporations responded by shifting their production process to East Asian countries and subsequently to South-East Asian countries in a manner explained by the flying-geese theory. The more recent trend of restructuring has been provoked by trade liberalization across the world

and facilitated by regional economic integration in different parts of the world. Again these trends have raised optimism among poorer countries with regard to participating in the industrial restructuring and in that process boosting their share of world output and manufactured exports. Although relocated production by Japanese MNEs has been of a footloose character moving from country to country with shifts in comparative advantage, South Asian countries' prospects of attracting that have been diminished by the recent crisis in East Asia.

South-East and South Asian countries have adopted regional economic integration in the 1990s with the launch of AFTA (complemented by AICO and AIA) by ASEAN and of SAPTA with eventual SAFTA and bilateral free trade agreements by South Asian countries. These steps, even though of recent origin, have started to facilitate efficiency-seeking restructuring of industry within the respective regions. This process is likely to gather momentum over time with the fuller implementation of the free trade agreements.

The implications of the above analysis for policy may now be summarized.

1. FDI inflows and prospects of integration of low-income and least developed countries

The overwhelming evidence in favour of the role of income levels, market size, levels of urbanization and quality of infrastructure as factors determining FDI inflows and their quality raises a question mark as to the ability of low-income and least developed countries to attract substantial magnitudes of FDI inflows despite their recent expansion and policy liberalization. In other words, MNEs pick up winners and then contribute to their further development.

The implication of the above findings for policy is that the poorest countries need to pursue alternative strategies for getting the process of their development going rather than waiting for MNE investment to stimulate the process of their industrialization and development with incentives and policy liberalizations. They would do better to focus on improving infrastructure and human resources, developing local entrepreneurship, and creating a stable macroeconomic framework and conditions conducive for productive investments to begin the process of development. The restoration of concessional development finance should help to complement the meagre domestic resources that can be invested. Once the pace of industrialization picks up, FDI will probably flow in by itself and help to carry the process forward. The international development community needs to discuss alternative ways of contributing to the industrialization of the poorest countries with a revival of transfer of capital and technological resources.

2. Role of regional economic integration

Regional economic integration can be used as a strategy to overcome the market size constraint of developing countries, especially the smaller ones, on their development and to increase their attractiveness to FDI. The importance of geographical and cultural proximity as determinants of FDI inflows also provides an additional rationale for regional cooperation. The formation of the Single European Market by EU member States and of NAFTA in North America among a number of such initiatives was prompted by the need to extend markets to enable efficiency-seeking restructuring of industry and exploit economies of scale, scope and specialization. The formation of these blocs has facilitated greater inflows of FDI to the member states, as is evident from the rising share of the European Union in global FDI inflows. Regional economic integration among developing countries may also help them to exploit the potential for intraregional investments, which may be substantial, and may

help in efficiency-seeking restructuring of industry in the participating countries.

Furthermore, to be effective and to facilitate efficiency-seeking restructuring, regional economic integration schemes should go beyond preferential trading regimes. Customs unions and free capital mobility should complement preferential or free trade regimes. This type of deep integration facilitates efficiency-seeking industrial restructuring of the type that has taken place in the European Union and NAFTA.

Finally, regional economic integration has assumed even greater relevance as a means of promoting economic development in the post-WTO regime than earlier. This is because policy measures such as local content regulations that have been used by Governments to deepen the integration of MNEs with the host Governments are no longer available with the TRIMs Agreement. However, regional economic integration schemes enjoy an exception under the Final Act of the Uruguay Round under section XXIV. As a result, the European Union and NAFTA are extensively using strict rules of origin to force foreign suppliers to the regions to localize certain parts of production within the trading blocs.

3. Strong national champions enable countries to reap the benefits of globalization

MNE investment has favoured locations that provide them with complementary location-bound created assets, especially for knowledge-intensive value-adding activities. Countries that are able to create "national champions" will be better placed to tap the MNEs' value-adding resources than others, especially in the internationally-oriented sectors. The national champions can enter into mutually beneficial alliances with foreign multinationals and could also give visibility to national capabilities in those industries.

4. An institutional framework for promoting FDI flows between developing countries could be useful

The efforts of low-income and the least developed countries in attracting FDI inflows may be more successful if they target flows originating in emerging sources such as NIEs and other developing countries than those originating in the more conventional sources, i.e. industrialized countries. There appears to be scope for institutional intermediation at the regional or international level for directing these flows to the poorer countries, given the constraints of information and financing. On the part of receiving countries, a specific targeting of developing country FDI may be desirable. Some countries, such as Columbia and Costa Rica, have already begun to target them successfully. Especially in the early stages of their development, developing country enterprises can be expected to have a scarcity of funds to finance their overseas operations on a basis comparable with their Western counterparts. Hence, the institutional infrastructure for promoting inter-developing country FDI and technology transfers may include the creation of a special fund to finance feasibility studies and for venture-capital-type financial support to projects based on developing country investments and technologies. In addition, some mechanisms of information dissemination among business enterprises of developing countries could be created. Networking of the chambers of commerce in developing countries could also be fruitful. Some initiatives of this type have already been taken at the regional level but need to be more effective.

5. Investment incentives offered by industrialized countries distort the pattern of FDI and need to be regulated

A large number of industrialized country Governments, especially state, regional or local Governments, extend large investment incentives

to attract FDI inflows to particular regions. UNCTAD has listed some prominent examples of investment incentives granted by state or local Governments in several industrialized countries. These include Setubal, Portugal offering a US$ 483. 5 million incentive in 1991 to an Auto Europa plant amounting on a per employee basis to US$ 254,451, or Tuscaloosa, Alabama in the United States offering US$ 250 million to a Mercedes-Benz plant in 1993, which works out to be a subsidy of US$ 166,667 per worker employed. It has been found that the location of Japanese FDI has been influenced by investment incentives. These incentives tend to distort the pattern of location of investments. Since resource-scarce developing country Governments can never match the incentives offered by those industrialized countries, they affect the investment climate in developing countries in relative terms or push them to indulge in costly incentive wars. Industrialized country Governments — federal as well as local — need to be brought under a certain discipline to regulate investment incentives to ensure that the pattern of distribution of FDI inflows is not distorted.

II. NEW APPROACHES TO TRADE AND INVESTMENT POLICIES IN ASIA AND THE PACIFIC

ESCAP Secretariat

A. Globalization and the need for a new paradigm for economic development

1. Globalization and the rise of the new economy

Over the last two decades, rapid globalization of production and markets has taken place, making national economies increasingly interdependent and interconnected. The international economic integration of goods, services and factors of production is advancing steadily. A plethora of new products and widened consumer choice are apparent outcomes. Dramatic improvements in telecommunications and transport technologies have also spurred the advance of the new economy. Information can be transmitted globally in a much shorter time than before. With the rapid growth of telecommunication technologies and increasing globalization of production and markets, smaller economies as well as larger ones cannot afford to become marginalized in the globalization process. Investment in research and development, new technologies and intellectual property is becoming very important. Firms and individuals that lag in these areas are at a serious disadvantage. Businesses are increasingly driven to form strategic alliances in order to spread risk and create a competitive edge.

The advent of the Asian financial crisis and its rapid spread across the region has now given rise to intense debate and discussion on open capital markets and the existing international financial architecture. This is especially pertinent in view of the ease with which capital can be attracted and withdrawn from an economy. Before turning to the issues surrounding how the developing countries in Asia might take advantage of a new or revised development paradigm, some questions concerning the role of the old development paradigm in causing the Asian crisis will be addressed in the following sections.

2. The Asian crisis and recovery

The previous high economic growth rate of the economies of East Asia and South-East Asia was mainly due to a development paradigm which put the emphasis on outward-orientation and economic openness, high export growth, high levels of domestic savings and investment, and sustained inflows of foreign direct investment (FDI), supported by generally sound fiscal and monetary policies. The continuous rapid growth was called the "East Asian miracle"[2] and one of its central features was the rapid accumulation of capital in these economies. Moreover, these societies placed strong emphasis on education and human resources development, resulting in a largely literate and increasingly skilled labour force. Along with human resources development, industries were encouraged to be outward-oriented and to focus on exports as a means of growth. Most of the high rate of economic growth was generated by the private sector. Despite the negative effects of the Asian crisis, the strengths shown by these economies in the pre-crisis period were not completely destroyed.

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[2] World Bank, *The East Asian Miracle: Economic Growth and Public Policy* (New York, Oxford University Press, 1993).

Before crediting government involvement with leading to the high levels of growth, it should be pointed out that the continuous growth shown by East Asia in the past two decades was only partly because of government facilitation. External conditions such as foreign intervention due to the Viet Nam War, a booming world economy with relatively high prices for primary industrial products such as textiles and the growth of multinational corporations worldwide all combined to lead to sustained high growth in East Asian economies. Therefore, the East Asian "miracle" was neither due to one simple paradigm nor was it, in reality, a miracle. It was a combination of good government policy and a supportive external environment. Also, while the close relationships between government, the private sector and financial institutions promoted consensus among economic agents and may indeed have been a major contributing factor to high economic growth, it could be argued that such high growth prompted complacency and allowed cronyism to creep into those relationships. This complacency and misplaced faith that the government would bail them out of any potential problematic situation led to financial deregulation and mismanagement without adequate regulations and supervision. Bank lending became increasingly politically motivated and led, in many cases, to the excessive exposure of banks to favoured borrowers. Implicit government guarantees further encouraged reckless borrowing and lending practices. Transparency decreased as corporate transactions and accounting practices became misleading, hiding the real situation from the market. This slackness permitted and even encouraged an excessive build-up of short-term private debt. Outmoded policies towards debt management in the corporate sector and non-transparency in the magnitude of offshore borrowing were notable failings in the economies hit by the crisis.

In the years before the crisis, excessive offshore borrowing occurred, encouraged by the pegged exchange rate of most of the crisis-hit economies. Such borrowing abroad appeared risk-free and highly profitable as long as the pegs held, given the interest rate differential between domestic deposits and offshore dollar lending rates. However, given the "macroeconomic trilemma",[3] meaning that countries must maintain an appropriate balance among the three objectives of open capital markets, fixed exchange rates and autonomy in monetary policy, these practices and the policy inconsistency could not be maintained. A failure to recognize the possibility of a cyclical downturn led to overconfidence and further increased borrowing, leading to increasing private debt. Political concerns led to delays in the correction of policies and contributed to a preference among bureaucrats for lax supervisory regulation, an absence of serious evaluation of non-performing loans and poor credit risk management. In particular, the mismatch between short-term liabilities (deposits) and long-term assets (loans and the collateral backing them) created high risk for the banking and financial sector. Governments exacerbated these problems by giving implicit guarantees to private borrowers and lenders.

3. The new paradigm: policy and institutional reform for a sustainable recovery

The question as to whether Asia can return to the high levels of economic growth it enjoyed before the Asian crisis can be answered by a definite "yes", assuming that appropriate policies including a stronger regulatory environment for financial borrowing and lending and stricter supervision of business practices are implemented. National competitiveness must be encouraged, but there is an increasing need to review the relationship between the Government and the business sector in many economies. The Asian financial crisis did

[3] Dani Rodrik, "How far will international economic integration go?", *Journal of Economic Perspectives*, vol. 14, No. 1 (Winter 2000), pp. 177-186.

not destroy the foundations for sustained high growth in the Asian developing countries but revealed an urgent need to strengthen them. While the labour force has remained disciplined, youthful and vigorous, the lack of technical and analytical skills among workers in higher value added industrial sectors has now become a major concern. And while the economies of the Asian developing countries have remained open to trade and investment, the lack of proper control and prudential supervision of financial flows associated with short-term investment have undermined countries' abilities to fully benefit from such openness. Also, currency depreciation and increasing foreign investment in the form of mergers and acquisitions instead of in the form of greenfield investment in potentially profitable sectors have led to an artificial recovery that does not address the fundamental reasons behind the Asian crisis or the question of global competitiveness. To their credit, even though they temporarily eased fiscal and monetary policies to cope with the recession, the crisis-hit economies have managed to keep inflation firmly under control. They have also built up their foreign reserves and begun the arduous task of cleaning up the financial and corporate bad-debt problem, although in most countries there is still a long way to go before a stable and efficient financial sector is re-established.

Thus, a return to continuous rapid growth is a long-term prospect and needs to be encouraged by supportive government policies which focus on increasing national competitiveness. An important area for improvement is investment in human resources, especially in areas such as the application and use of information and communications technologies, where Governments have often lagged behind. Also, it is necessary to phase out or upgrade the so-called "sunset industries" in some countries instead of protecting them with subsidies, as is the case at present. This will allow increased competition in the global marketplace. It is also important to focus on infrastructure development, especially for information and communications technology (ICT), and on improving the access of rural people to such technologies. But traditional infrastructure such as telephone lines, roads and access to basic health services is also important and should be taken into account. These factors are essential for sustaining and strengthening national competitiveness and, along with the traditional approach to open economies, should boost economic growth and attract new flows of greenfield FDI.

However, the question as to whether there is a need for a new paradigm for development in East Asian and South-East Asian economies can be answered by saying that it depends on the circumstances and differs from country to country. In general, there is no need for a wholly new paradigm but changes have to be made to previous development policies and attitudes in many of the crisis-affected countries. Also, new policies should reflect the realities of the regional and global economic situations instead of being continued from before merely because they had worked well so far. The globalization process has minimized national capacity in decision-making as countries have to become integrated into the regional and global economy or miss out on the benefits of globalization. While the lack of national capacity in making policies may trigger opposition to globalization in some quarters, the process is inevitable and needs to be manipulated to national advantage. In this context, there is a need to review the national development process and institutional framework, in particular with regard to government/private sector relationships in some countries. In addition, all countries need to address the reform of financial supervisory agencies and policies. There is also an urgent need to address the fiscal implications of resolving the bad loans in the financial sector and to restore the capital base of the banking system. Preparing these economies to take advantage of the rise of the new economy

involves a set of institutional challenges. These have to do with good public and private-sector governance, development of human resources (in particular, improved computer literacy and training), upgrading telecommunications and related infrastructure and providing a supportive but competitive environment for business development related to information technology and the digital economy.

B. Implications of the new economy for financial, trade and investment policies

1. Financial policies and institutions

The new economy means that financial institutions and markets have to operate according to the rules of the market. The Asian crisis revealed the problem of the "macroeconomic trilemma" facing outward-oriented, open economies. In this context, in some countries in Asia, the attempt to maintain dollar-pegged exchange rates in the presence of capital mobility and a large interest rate differential between domestic and offshore markets gave rise to incentives to borrow, often short-term and in foreign currencies, and to invest excessively in higher-yielding domestic assets. The risk inherent in such a non-sustainable combination of policies increased as short-term borrowings rose relative to reserves, inviting speculative attacks on the currencies of the countries concerned. The speculative attacks, in turn, forced countries to choose between abandoning pegged exchange rates and attempting to repulse the attacks by using official reserves to buy domestic currency. In most cases, countries chose the latter course, with the result that they depleted their reserves. In the end, panic spread among domestic and foreign investors alike, leading to massive capital outflows and the collapse of domestic asset prices. This forced many domestic financial institutions to contract credit and sent these economies into a downward spiral. The devastation of corporations and banks was severe and many have not yet recovered from the effects of the crisis.

Other lessons to be derived from the experience of the crisis of 1997-1998 for exchange rate regimes, monetary policies and financial market supervision are now being debated. It is now generally understood that while financial liberalization is necessary, it should proceed at a sustainable rate and without disregard to matters of prudential regulation and supervision. Regional network arrangements for currency swap-and-repurchase to cope with future episodes are under active discussion. The Chiang Mai initiative is an agreement between the member countries of the Association of Southeast Asian Nations plus China, Japan and the Republic of Korea to cooperate in order to deter speculative attacks on one another's currencies.

The reform of financial institutions and markets has now been made a priority by all the countries of the region, in particular, the countries hit by the crisis although the reform process has proceeded at varying speeds and to varying degrees. For instance, while the Republic of Korea has probably made the most progress, non-performing loans and poorly performing financial institutions in Indonesia, plagued by scandal, remain problematic. In fact, Indonesia lags behind the rest of the region in recovering from the crisis because of internal tensions which have affected policy-making and implementation. In Thailand too, progress has been limited and non-performing loans continue to stifle the economy while financial institutions remain reluctant to extend credit. In the relatively more successful Republic of Korea, also, problems remain with debts owed by large State-owned corporations and continued financial problems in the non-bank financial sector. In all countries, there is an urgent need to strengthen bankruptcy, disclosure, transparency and monitoring laws and, in particular, the enforcement

of such laws and to strengthen the autonomy and competence of supervisory agencies such as central banks, while improving their accountability.

2. Trade and investment policies

Trade formed a high share of gross domestic product in the economies hit by the crisis. Most of the economic growth depended on increased trade. Trade dependence rose sharply during the 1990s. From an early dependence on the United States, trade dependence had transferred to the other economies in the region by the outbreak of the crisis.[4] Underlying the rapid expansion of intraregional trade in recent years has been a massive expansion in FDI flows in the region. Trade policy reform has figured prominently in the rising importance of trade and FDI in the region. Unilateral liberalization of tariff and non-tariff barriers took place in Indonesia, Malaysia, the Republic of Korea and Thailand during the 1990s. The multilateral trading system made an important breakthrough with the Uruguay Round of multilateral trade negotiations in bringing trade in services, agriculture and textiles under the umbrella of the negotiations. In addition, rules governing trade-related aspects of investment, intellectual property and technical standards have also been brought under greater discipline. Developing countries face challenges as well as benefits from the WTO process as it provides market access and creates a more level playing field but presupposes that developing countries undertake trade liberalization and create an enabling environment to benefit from the WTO process.

Increased economic integration has also been facilitated by investment policy reforms which have been introduced in many developing countries in the Asia-Pacific region, especially the crisis-affected economies. Ownership restrictions have been loosened significantly in most sectors, including property ownership and real estate. Remarkably, FDI inflows increased during 1997 despite the outbreak of the crisis in Malaysia, the Republic of Korea and Thailand, though FDI fell sharply in the case of Indonesia.[5] However, it should be noted that FDI mostly increased in the form of takeovers of struggling domestic companies and mergers between foreign and weakened domestic companies rather than greenfield investment. More recently, there has been concern that FDI in South-East Asia is clearly on the decline. Policy measures to increase FDI are necessary for countries to benefit from increasing regional and global trade liberalization and new policy measures have been formulated by many developing countries in the Asia-Pacific region[6].

In reviewing the trade and investment policies that have been put in place in recent years in the crisis-affected Asian economies, it is noteworthy that none of the countries have retreated from commitments to open markets. However, there is now growing concern that countries need to upgrade their competitiveness urgently through upgrading of factors of production (especially human resources development), industrial restructuring and application of ICT and forging backward and forward linkages among economic sectors with particular attention to the role of agriculture and small and medium-sized enterprises (SMEs). FDI should be seen as a major contributing factor to competitiveness and innovation rather than as a threat to domestic business as long as proper linkages between transnational corporations and the

[4] International Centre for the Study of East Asian Development (ICSEAD), "Recent trends and prospects for major Asian economies", *East Asian Economic Perspectives*, vol. 11, special issue (February 2000).

[5] Asian Development Bank, *Key Indicators of Developing Asian and Pacific Countries 1999* (New York, Oxford University Press). No data on FDI are readily available for Hong Kong, China.

[6] For further details of investment promotion policies in selected developing Asia-Pacific economies, contact the institutions listed in the Annex.

domestic private sector, particularly SMEs, are built. As has been written before, an enabling environment for new businesses and for existing businesses to access information, receive training and become involved in technology upgrading and transfer is necessary so that the crisis-hit economies can build upon the nascent recovery process.

C. Regional trading arrangements

In view of the recent trend towards increasing regional integration of economies, the role of regional trading arrangements (RTAs) has to be scrutinized carefully, especially as they are an important component of the new economy and a crucial modality for subregional and regional cooperation. RTAs in Europe and North America have played a substantial role in increasing international economic integration for economies in those regions. However, RTAs should be WTO-consistent and be used as building blocks of a broad trade liberalization strategy by being trade-facilitating rather than trade-distorting. By their very nature, RTAs could be viewed as discriminatory and having the potential to divert trade and the activity of firms, including investment, from non-member to member countries. The use of disparate rules of origin as commercial policy instruments, for example, may exacerbate trade diversion in key sectors.[7] The harmonization of rules of origin and margins of preference within any Asian agreement on free trade or closer economic relations would avert what Bhagwati has called a "spaghetti bowl" of overlapping and inconsistent preferential agreements.[8] Rules of origin in any Asian free trade area should aim to be consistent across industries and should be as simple and transparent as possible. Even though on the whole, RTAs may be trade-creating, this does not mean that the net welfare effects are always positive from the standpoint of non-members. Such hidden effects of RTAs should be carefully noted and minimized by the countries involved in such trading arrangements. RTAs in Asia are gaining momentum[9] but it is important that these agreements move forward under the new Asian regionalism.[10]

Successful agreements in the region can strengthen the bargaining power of the Asia-Pacific countries in global and bilateral negotiations. Regional free trade agreements can also be used to enhance the global competitiveness of Asian firms. Such agreements provide Governments with political leverage to introduce domestic reforms. The Chiang Mai initiative and new free trade agreements between Singapore and Japan and Japan and the Republic of Korea are indicative of the new Asian regionalism in the early twenty-first century. However, to limit trade diversion, RTAs should be seen primarily as stepping stones to the multilateral trading system and should refrain from increasing the level of discrimination against non-members. Regional and international agencies could play a fundamental role in promoting regional cooperation to support national efforts to meet the challenges of globalization. ESCAP, an agency with regional geographical coverage and a specific mandate for promoting regional economic cooperation, could develop human resources and

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[7] William E. James and Oleksandr Movshuk, "International economic integration and competitiveness: an analysis of market share in manufacturing industries in Japan, Korea, Taiwan and the United States", *ICSEAD Working Paper Series*, vol. 2000-04 (Kitakyushu, May 2000).

[8] Jagdish Bhagwati, "Fast track to nowhere", *The Economist*, 18 October 1997, pp. 21-23.

[9] Preferential trading arrangements in the region include the ASEAN Free Trade Area (AFTA), the Australia and New Zealand Closer Economic Relations Trade Agreement (CER), the South Asia Preferential Trading Arrangement (SAPTA), the Bangkok Agreement, the Economic Cooperation Organization (ECO), the Melanesian Spearhead Group, the proposed Pacific regional trade agreement (PARTA), the South Pacific Regional Trade and Economic Cooperation Agreement (SPARTECA) and subregional growth triangles.

[10] C. Fred Bergsten, "East Asian regionalism: towards a tripartite world", *The Economist*, 15 July 2000, pp. 20-22.

build capacities of both public and private institutions of developing member countries, with particular attention to the needs of the least developed, landlocked and island developing countries and economies in transition, to facilitate their integration into global and regional trade and investment markets. Other local and international institutions could assist and collaborate in the task of assisting developing countries in integrating into RTAs and into the global trading system while minimizing the risks associated with such integration.

D. Policy recommendations

Despite the negative effects of the Asian crisis, the momentum for globalization and the new economy is likely to continue. Countries have to formulate and implement policies which will allow them to take advantage of the benefits of globalization while minimizing the potential negative effects. Some policies and actions that could be followed at the national, regional and international levels in the post-crisis era in Asia and the Pacific are discussed in the following sections.

1. National level

(a) Macroeconomic stability and flexibility

In order to participate effectively in the globalized economy, a certain degree of stability in macroeconomic parameters such as price level and flexibility in policy instruments such as the exchange rate and interest rate is needed. A reassessment of previous policies is needed along with flexible implementation of new policies. Governments should determine and adapt policies for macroeconomic stability suited to the global economic trends. Financial-sector restructuring policies and policies on related issues such as exchange rates and public spending should complement each other for maximum benefit. The role of human capital should be given importance through increased focus on training and social capital development.

(b) Trade and investment liberalization

Liberalization of international trade and investment regimes as a means to encourage inflows of new ideas, skills and technologies and to capture the gains from trade and investment needs to be continued. In this regard, a change in emphasis from excessive dependence on foreign borrowings in favour of FDI is needed. Even among FDI, the focus should be on attracting greenfield investment and not merely FDI for mergers and acquisitions. At the same time, the need to liberalize the financial sector and the consequences of hasty liberalization should be assessed. Also, problems of the sequencing of current and capital account liberalization should be resolved through systematic economic analysis. Overall, it is necessary to have well-qualified trade and investment officials who can formulate effective policy for economic growth. Supervision and regulations for monitoring also have to be strengthened. Transparency should be encouraged. It is important to realize that national trade policy-making depends not only on domestic considerations but on a thorough understanding of the impacts of the international trading system on domestic stakeholders as well as an understanding of international constraints on domestic policy-making. Standard trade policy measures such as tariffs and quotas are becoming less relevant in today's multilateral trading environment and new challenges are arising for Asia-Pacific economies based on the evolutionary international trading system.

(c) National competitiveness and information and communications technologies (ICT)

ICT is driving globalization and the new economy and is therefore a major aspect leading

to increased national competitiveness. Countries which lag behind in the development and use of ICT are likely to receive minimal benefits from the new economy. Thus, countries need to implement policies and strategies for the effective application and utilization of ICT. For this purpose, it is necessary to create an enabling environment where ICT can be used for maximum benefit. It is also important to ensure a significant rise in the allocation of national resources towards ICT so as to widen and deepen their use across all sectors of the economy. In this context, some of the policies that can be implemented at the national level are: (a) tariff reductions on information technology-related products to facilitate cheaper availability of computers and telecommunications equipment; (b) the further opening up of telecommunications to competitive provision of services and the reduction of restrictions on foreign ownership; (c) the establishment of a market-friendly regulatory environment for electronic commerce and Internet-based businesses; and (d) the removal of restrictions on Internet-based business transactions. Overall, it is necessary not only to increase the use of ICT in economies in East and South-East Asia but to encourage the use of such technologies in the developing regions of Asia-Pacific through technology transfer, education, institution-building and human resource development.

(d) Capacity-building of small and medium-sized enterprises

Policies restructuring human resources development towards higher value added industrial sectors and research and development to encourage technological innovation should be introduced in order to maintain the international competitiveness of industries. Special attention should be given to the capacity-building of SMEs, particularly those in the dynamic export-oriented manufacturing sector and in the services sector. Promotion and development of SMEs are important since recent evidence shows that, during the Asian crisis, when thousands of workers were laid off by larger enterprises, SMEs absorbed a large number of these unemployed workers and provided a much-needed social safety net for the people affected by the crisis. As a result, it is necessary to promote not only SMEs in export-oriented sectors but also those in rural areas, which have the important role of providing income and job security to rural residents.

(e) Capacity-building of national institutions

One of the important lessons learned recently was the need for national institutions to deal effectively with the challenges and risks associated with growing interdependence and globalization. This need was clearly seen in the financial sector and, in particular, in the banking sector of a number of countries affected by the crisis in the ESCAP region. It is necessary to upgrade the organizational, legal and regulatory framework for effective supervision of the financial sector. Government capacity for debt management also needs to be improved. Private financial institutions should be strengthened through a well-regulated risk management programme. In addition, many countries in the region do not have effective national institutions to manage matters related to trade policy reforms in the context of WTO. Hence, there is an urgent need to strengthen the capacity of national institutions and to train and build the capacity of officials in responding to the new challenges arising from increasing globalization and the evolutionary multilateral trading environment.

(f) Public- and private-sector partnership

The private sector is increasingly seen as an engine of economic growth. In an open and liberal environment, the role of government is primarily to create an enabling environment for the private sector to play the leading role in production and marketing. In this regard, the private sector could be given a greater opportunity to be involved in

the process of policy formulation affecting the business sector. An effective partnership between government and the private sector would assist in increasing the efficiency of firms and in developing communication and information exchange linkages. However, it is necessary to ensure that adequate transparency measures are in place so the partnership is not misused by either party.

2. Regional level

(a) Regional trading arrangements

As regional integration arrangements constitute an important component of the new economy and a crucial modality for subregional and regional cooperation, regional trading arrangements among Asian and Pacific economies that would cover most trade and ultimately lead to the removal of all trade barriers on a non-discriminatory basis could be used as the building blocks of a broader trade liberalization strategy on a par with similar initiatives in Europe and the Americas. In this regard, a key requirement is the reduction of external barriers on a most-favoured-nation basis in parallel to the preferential trade liberalization within a particular RTA. Given the important role that these arrangements can play in the process of multilateral trade liberalization, it appears worth while for ESCAP member countries to pursue membership in existing arrangements such as the Bangkok Agreement, ASEAN and SAARC rather than starting fresh initiatives. It is necessary to keep in mind, as illustrated earlier, that RTAs have to remain trade-creating and not trade-distorting.

(b) Regional cooperation in the financial sector

With regard to the financial sector, in order to prevent future financial crises and reduce the vulnerability of countries to economic and financial turmoil, regional cooperation initiatives such as the establishment of an Asian fund and other regional mechanisms for the exchange of information and early warning systems could be seriously pursued.

3. International level

(a) Effective integration into the multilateral trading system

Many developing countries in the region find it difficult to integrate effectively into the world trading system on a fair and equitable basis. In order to develop a trading system that is truly global, it is imperative for these countries to become an integral part of the system without being further marginalized. More than half of ESCAP member countries remain outside WTO and developing countries that are current members of WTO in the region have yet to benefit from the world trading system. In this regard, priority should be given to the effective implementation of Uruguay Round results and to the negotiations under the built-in agenda. The inclusion of issues that are not covered by WTO at present, such as environmental and labour standards, could give rise to new restrictions on the exports of ESCAP developing countries.

E. Conclusion

The recovery that has gained momentum since 1999 indicates that the region's potential for high growth did not end with the crisis. Admittedly, this recovery is to a large extent due to fiscal stimulation and weak currencies and does not reflect strong international competitiveness. The region can no longer afford to rely on past policies and practices to sustain high economic growth in the twenty-first century. For long-term sustainable growth to occur, growth in factor productivity caused by technological change is more important. In this context, the old paradigm of economic development should be modified in order to take better advantage of the new economy and globalization, especially in ICT. While economic

liberalization and a commitment to open markets should be maintained, a mechanism for the prudential supervision of financial markets and institutions and a strengthened legal and regulatory framework for private-sector transactions, in particular, in the areas of disclosure and transparency, should be established to make the liberalization process sustainable. Since the transformation of national economies to "new economies" is basically private-sector-driven, Governments should implement policies which would stimulate both domestic and foreign investment in key areas such as the application and utilization of ICT, human resources development and SME promotion and should take care of the concomitant need to upgrade infrastructure and human resources.[11]

[11] The full text of the report of the Steering Group and country papers presented at the meeting are available at <*www.unescap.org/itid/publication/occasional.htm*>.

Annex

List of investment promotion agencies/institutions of selected Asia-Pacific economies

Bangladesh
Board of Investment
Prime Minister's Office
Shilpa Bhaban, 91 Motijheel C/A
Dhaka 1000
Telephone: 880-2-9563573
Fax: 880-2-9562312
E-mail: <*ec@boi.bdmail.net*> or
<*tawfiq@drik.bgd.toonet.org*>
Web site: <*www.bangladesh-boi.org/index.html*>

Cambodia
Council for Development of Cambodia
Government Palace, Sisowath Quay
Wat Phnom, Phnom Penh
Telephone: 855-23-981156
Fax: 855-23-361616

Islamic Republic of Iran
Ministry of Economic Affairs and Finance
Sour Esrafil Street
Bab Homayoun Avenue
Tehran 11144, Islamic Republic of Iran
Telephone: 9821-3110040
Fax: 9821-3900528
Web site: <*www.iranianlaw.com*>

Kazakhstan
Ministry of Economy and Trade
Astana, 2 Beibitshilik Street
Telephone: 7-3272- 333003
Web site: <*www.kazakhstan-gateway.org*> or
<*www.kazecon.kz*>

Kyrgyzstan
Complete details of Kyrgyzstan's investment laws are available at <*http://kyrgyzinvest.org/en/economy/invest.htm*>.

Lao People's Democratic Republic
Foreign Investment Management Committee
Luang Prabhang Road, Vientiane
Telephone: 856-21-216662
Fax: 856-21-215491

Nepal
Ministry of Industry
Foreign Investment Promotion Section
Singha Durbar
Kathmandu, Nepal
Telephone: 977-1-216692, 977-1-244140
Fax: 977-1-220319
E-mail: <*amaa@mos.com.np*>
Web site: <*www.yomari.com/fips/introduction/introduction.html*>

Papua New Guinea
Investment Promotion Authority Papua New Guinea
PO Box 5053, Boroko NCD, Papua New Guinea
Telephone: 675-3217311
Fax: 675-3202237
Web site: <*www.ipa.gov.pg/ipamain.htm*>

Solomon Islands
The Secretary
Investment Board
Department of Commerce, Employment and Tourism
PO Box G26, Honiara, Solomon Islands
Telephone: 677-21928 or 677-23015
Fax: 677-21651 or 677-25084
E-mail: <*fib@commerce.gov.sb*> or
<*commerce@commerce.gov.sb*>
Web site: <*www.commerce.gov.sb*>

Viet Nam
Foreign Trade and Investment Development Centre
92-96 Nguyen Hue Street, District 1
Ho Chi Minh City
Telephone: 84-8-8222982, 84-8-8222956
Fax: 84-8-8222983
E-mail: <*ftdc@bdvn.vnmail.vnd.net*>

III. INFORMATION AND COMMUNICATIONS TECHNOLOGIES FOR POVERTY REDUCTION IN THE ASIA-PACIFIC REGION

ESCAP Secretariat

A. Introduction

Since the mid-1990s, there has been remarkable growth in the dissemination and use of information and communications technology (ICT) worldwide. The use of mobile telephony, satellite communications and, especially, the rise of the Internet have led to increasing discussions about the growth of a new "knowledge-based" economy powered by ICT. Globalization has been fostered and accelerated by the rapid expansion of the Internet and the use of ICT in the production, distribution and consumption of goods and services. One of the major uses of ICT in development is its potential to assist people in developing economies to generate income through increased access to and sharing of information. However, as yet the use of ICT is low in the less developed areas of the world. The United Nations Development Programme estimates that only 14 per cent of all Internet users globally are from developing countries and there are wide disparities within countries as well. For instance, in Africa, out of an estimated 1.6 million Internet users, around one million are in South Africa. This is in contrast to North America where around 60 per cent of all Internet users reside, even though it has only 5 per cent of the world's population[12].

Despite the unequal distribution of people with access to the Internet and other ICTs globally, various incentives have been started in the developing regions of the world to increase access to ICTs and use them for effective sustainable development, especially in rural areas. ICTs in rural or disadvantaged communities have been promoted by international organizations, non-governmental organizations (NGOs), Governments and the private sector as a tool for economic and social development. As a result, many projects and programmes have been implemented to bring ICTs to rural or disadvantaged communities with the aim of facilitating the flow of information between the target communities and the outside world, and/or between communities. Their impact is difficult to measure in quantitative terms but project evaluations reveal significant benefits,[13] including:

- Poverty reduction through direct and indirect job creation;
- Income for village phone operators and telecommunications operators;
- Marketing opportunities for individual producers and small businesses;
- Access to information relevant to livelihood (e.g. information on tides and other fishery information provided to fishermen);
- Access to information on government entitlements, services and training opportunities;
- Access to information on ways to improve agricultural production;
- Increased access to education (distance education) and training;
- Social mobilization - community initiatives based on exchange of experience (e.g. establishment of a village savings cooperative);

[12] <*www.sdnp.undp.org/about*>.

[13] *Success Stories of Rural ICTs in a Developing Country*, report of the PANAsia Telecenter Learning & Evaluation Group's Mission to India (IDRC, November 1999 <*http://www.idrc.ca/pan/telsuccstories_e.htm*>).

- Protection of local resources and sustainable use of environmental resources (e.g. the patenting of indigenous knowledge by a commercial entity was successfully challenged based on information accessed via ICTs; and establishment of a herbal processing centre);
- Empowerment of women through entrepreneurial activity;
- Reduced costs of social and other communications and quality of life benefits for individual users;
- Facilitation of flow of remittances from overseas family members;
- Medical services through "telehealth" facilities and online networking.

As technological change brings the costs of communications within the reach of a larger number of people, more communities can potentially reap similar benefits.

But, in a context where ICT has become a "hot" topic, some warn against blindly investing in ICTs rather than continuing to focus on meeting basic needs such as clean water and education.[14] Some also question whether ICT introduction represents the "latest wave of colonization" in developing countries and warn against creating "passive consumers" and weakening social relationships.[15] Examples are given of the negative impacts of introducing ICT to people who have had little or no contact with the world. Social relationships within isolated communities and between such communities and the world are likely to be radically altered by the introduction of ICT. For instance, when the Internet was introduced to remote tribes in Guyana, it was expected that handicrafts could be sold online for increased income generation. Women began making money by marketing hammocks online for US$ 1,000 each, a very high income for such cash-strapped communities. The tribal power structure tottered and, finally, a threatened traditional leadership took control of the sales. The women, who made the hammocks, were alienated and driven out of the organization. Finally, the project collapsed amid tension and discord.

There are many such examples where unforeseen consequences arise from good intentions and from the introduction of new technology. In promoting ICT for development, it is essential to remember that bringing technology does not automatically lead to information exchange, empowerment and better living conditions for all. In other words, ICT alone is not enough to lead to poverty reduction in the economies of the Asia-Pacific region. It is necessary to have supportive and flexible policies and strategies for the dissemination and use of ICT. Despite some experiences which have shown that ICT use could have negative effects, the focus for developing countries is not to be isolated from ICT but to use it in such a way as to maximize its benefits while ensuring that negative effects are minimized.

ICTs are crucial for development. International concern regarding the threat of marginalization of individuals/communities/countries with insufficient ICT use supports any credible initiative to improve access to these technologies. This article seeks to identify best practices for and lessons learned by development-oriented organizations in promoting ICT use by rural or disadvantaged communities for poverty alleviation. Based on the experiences and involvement of the international community to date, suggestions are made for ESCAP involvement in this area.

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[14] Peter Benjamin, Mona Dahms, "Socialise the mode of production - the role of telecentres in development " *Telecentre Evaluation: a Global Perspective* (IDRC, September 1999 <*http://www.idrc.ca/telecentre/evaluation/nn/10_soc.html*>).

[15] R. Gomez, P. Hunt, E. Lamoureux, eds., "Telecentre evaluation and research: a global perspective", *Telecentre Evalution: a Global Perspective* (IDRC, September 1999 <*http://www.idrc.ca/telecentre/evaluation/nn/06_Tel.html*>).

B. Bringing ICT to rural and disadvantaged communities: various models, best practices and lessons learned

The proliferation of ICT in the economies of the Asia-Pacific region has not been even. The growth of information and communications technologies has been more rapid and widespread in some areas than others. As a result, three tiers of countries at different levels of ICT penetration and use can be identified. These are:

- *1st tier*: Developed economies like Singapore; Hong Kong, China; Taiwan Province of China; Australia; and New Zealand, where ICT access and use are widespread and more advanced technology such as multimedia and e-commerce is becoming more and more common.

- *2nd tier*: Economies in the second tier have well-established and diversified Internet service providers (ISPs) and have web sites and information sharing in local content as well as a rising number of users. But, in many of the second-tier economies, telecommunication remains regulated and access to the Internet is difficult. Countries in the second tier include India, Indonesia, China, Thailand, Pakistan, Sri Lanka, Nepal, Pakistan and the Philippines.

- *3rd tier*: These economies have strict legislation limiting dissemination of ICTs, a State telecommunications monopoly and limited local content and have only very recently allowed Internet access for their population. Third-tier countries include Pacific Island economies, the Lao People's Democratic Republic, Viet Nam and Bhutan.[16]

With such a diverse group of economies at different levels of ICT use present in the Asia-Pacific region, it is a challenge to ensure that ICT is disseminated and access to it increased among the populations of developing economies in the region. Providing access is a first priority in promoting ICT use for the benefit of rural or disadvantaged communities, where access to ICTs is usually limited or non-existent. Fixed-line installation is subject to high cost in rural areas with low prospects for commensurate levels of revenue generation. Basic telecommunication network expansion in rural areas is slow. Connectivity, used here as a measure of the availability of connections to the existing telecommunication infrastructure, is therefore low in these areas. Where fixed lines exist, many rural poor cannot afford their own connections for voice telephony, much less other ICT equipment such as personal computers or digital cameras. Usually low levels of literacy and unfamiliarity with the use of ICTs also make ICTs virtually inaccessible to the majority of the rural and disadvantaged poor. Recent efforts have therefore focused less on telecommunications access for each rural home and more on access by the community.

It is clear that the situation will differ significantly within various regions of a given country but generalizations can be made. According to two rankings of e-business readiness, connectivity and accessibility are weak in countries of Asia and the Pacific with the possible exceptions of the Republic of Korea; Taiwan Province of China; Singapore; Hong Kong, China; Australia; New Zealand; and Japan.[17]

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[16] UNESCO, *World Communication and Information Report 1999-2000* (Paris, 1999).

[17] *Risk E-Business: Seizing the Opportunity of Global E-Readiness* (McConnell International and World Information Technology and Services Alliance, August 2000 <http://www.mcconnellinternational.com/ereadiness/EReadinessReport.htm>) and from "E-readiness rankings" (Economist Intelligence Unit [EIU], 8 May 2001 <*http://www.ebusinessforum.com*>).

Box 1. The development of information and communication technologies in Nepal: the way ahead?

Nepal is one of the least developed countries in the Asia-Pacific region. However, recently, it has gained recognition for having a competitive Internet market with the lowest rates for connectivity in the South Asian region. Internet-related businesses have flourished and international contracts are even awarded to Nepalese IT firms. Despite the relatively rapid growth of Internet users in the country, Nepal still has problems with the telecommunications sector and, especially, with access to telephones. While an important milestone was reached in 1999, when teledensity reached one line per hundred people and telephone service is now available in all 75 districts of the country, problems such as limited access and slow response to demand remain. The mountainous terrain has acted as a major obstacle to the distribution of fixed lines across the country and two thirds of the country's telephones are in the Kathmandu area. Many villages are waiting for telephone services to reach them and more than 275,000 people are on the waiting list for a telephone, showing the slow response time of the Government (ITU, *Asia-Pacific Telecommunication Indicators*, prepared for Asia Telecom 2000. Summary available at <*www.itu.int/journal/2000009/E/html/Indicat.htm*>. Other problems in telephone provision include the dominance of the State-owned Nepal Telecommunications Corporation (NTC) over all telecommunication in the country.

However, there are signs that NTC's dominance might be declining soon as the market has recently been opened up to competition. The Government is currently looking at means to privatize NTC. Also on the positive side, the Government has developed a comprehensive plan for telecommunication development which has fostered many of the recent improvements. The National Telecommunication Act of 1997 has led to increased competition in the ISP market, establishment of cellular mobile phone service and possible entry of more telecommunication providers into the market. Nepal's Internet provision has been earning international praise. Internet service providers (ISPs) were allowed to have their own international gateways in 1999, thus opening up the market to competitiveness. By January 2000, eight ISPs were serving 9,000 subscribers and around 35,000 users with the number growing rapidly (ITU, *Asia-Pacific Telecommunication Indicators*, prepared for Asia Telecom 2000. Nepal is one of the ITU case studies for IT development.

But, in spite of the dynamic Internet market in Nepal, communications are likely to be slowed down by infrastructural and human resources problems. While the city of Kathmandu is moving ahead in Internet provision and use, Internet access for rural areas and for potential poverty reduction is limited because of a lack of human resources, non-existing telecommunication infrastructure in rural areas and inadequate legislation for Internet promotion. For instance, only around 15 per cent of the country has electricity and the far Western region is virtually dark. In addition, though Internet usage rates are the lowest in South Asia, they are still beyond the income of most of the Nepali people (ITU figures show the annual charge for monthly 15 hours of dial-up use as 65 per cent of GDP per capita for Nepal). Also, there is no nationwide dial prefix for Internet use meaning that users located outside Kathmandu Valley will incur long-distance call charges as they use the Internet. There is no provision for a reduced tariff for Internet access. A large proportion of the population is illiterate and there are minimal provisions for web sites using the Nepali language font as most web site developers concentrate on publicizing externally and therefore use English.

Box 1. The development of information and communication technologies in Nepal: the way ahead? *(continued)*

The dynamic and rapidly growing market for Internet in Nepal does give some hope that these problems can be overcome with effective government policies and cooperation from the private sector. In fact, in 2000, the Nepalese Government set up an innovative consultation process and opened the floor to the public to debate the proposed national ICT Policy and Strategy. In addition to online consultations, a national workshop was held in August 2000, with participation from government and private-sector organizations, experts and international NGOs, to debate the potential policy on ICT. It was decided that the focus must be on providing access to the greatest number of people and not in "connecting" each single person. In many rural areas, a community-based Internet service can be used for communication, information-gathering and dissemination, education and even e-commerce. Despite infrastructural and human resources problems, Nepal's ICT policy is moving ahead.

Note: Further information on regulatory procedures, licensing and related telecommunications issues for Nepal can be found at the Internet from the Top of the World: Nepal Case Study (ITU , November 2000 <www.itu.int/ti/casestudies/nepal/material/nepal.pdf>). Also, information on Nepal's telecommunications industry can be obtained from the Computer Association of Nepal web site at <*www.caninfo.org*> and the Nepal Telecommunications Corporation web site at <*www.ntc.net.np*>. Six background papers for the National ICT Policy and Strategy are available at <*www.nepalnews.com/NPC.htm*>. Also, details of Nepal's progress in ICT use and dissemination can be obtained from Pan Asia's information server located in Nepal through <*www.panasia.org.sg/nepalnet*> which promotes the use of ICT for sustainable development in Nepal.

Box 2. Singapore's experience with ICT: showing the way

Singapore remains a leader in the use of ICT not only in the Asia-Pacific region but also in the world. As the world's most "wired" country, government data at the end of January 2001 showed a 48.3 per cent household penetration of the Internet, which is the world's highest, surpassing IT "superpowers" such as Japan and the United States (from Infocomm Development Authority of Singapore, <*www.ida.gov.sg/website/IDAhome.nsf/Home?OpenForm*>, data for January 2001). Mobile phone use is also high with Singapore being one of the few countries where there are more mobile than fixed telephone subscribers and the mobile phone penetration is very high at 63.1 per cent (end of January 2001).

The remarkable success of Singapore in adapting and using ICT was mainly because of a literate, well-educated workforce, appropriate infrastructure and, especially, a supportive government policy which matched innovative ideas with appropriate planning. The telecommunication sector is highly liberalized with overall liberalization including full competition introduced on 1 April 2000. Facilitative government policy includes complementary programmes for the development and use of ICT including progressive liberalization of the telecommunication sector and the promotion of sustainable competition. Major programmes, which complement each other for maximum benefit, include:

Box 2. Singapore's experience with ICT: showing the way *(continued)*

- Development of the telecommunication industry through setting appropriate policies promoting competition and with adequate supervisory capacities
- E-commerce promotion including a local enterprise computerization programme and an e-business development programme
- Human resources development, focusing on developing the IT skills and innovative capabilities of youth and professionals. Recently, a newly-formed industry-driven human resources development committee was established to target the needs of enterprises for specific human resources.
- Technology development to identify, innovate and implement information technology relevant to Singapore and to establish a secure business environment for overall technological adaptation and usage.
- Market access development to focus on the needs of local businesses in information collection and dissemination, allowing them easier access to regional and global markets.

Note: For further information on Singapore's ICT regulations and programmes, access the IDA web site at *<www.ida.gov.sg>*.

Box 3. Using ICT for development in the Pacific: diminishing distances

The collection, coordination and dissemination of information is difficult in the island economies of the Pacific because of geographical and infrastructural constraints. Many of these economies consist of numerous small islands which are often spread out over hundreds and even thousands of kilometres in the ocean. Thus, communication and information coordination is difficult and time-consuming. As an alternative to the traditional methods of communication through fixed lines or newspapers, new methods of using ICT for access to and use of information are a possibility. However, the lack of current infrastructure for ICT distribution, the low skills of the population and the status quo in many economies, where one telecommunication provider has a monopoly, mean challenges to the dissemination of information are not only geographic but multidimensional.

The lack of an adequate telecommunication infrastructure in many of the economies in the Pacific hinders the effective distribution and use of ICT. In Fiji, where the overall telephone density is among the region's highest at 10.3 per 100 people, rural areas are practically cut off from the main telephone network. The rural telephone density is only 0.8 per 100 people. It has been hoped that recent privatization measures will increase competition and coverage. Privatization started in December 1998 but slowed down because of political turmoil in 1999. Since June 1999, Fujitsu and Telecom Fiji have been working together to improve access of all people to ICT, especially through mobile access and wireless technology. The concept of wireless technology has the potential to overcome geographical difficulties in the Pacific islands and should therefore be promoted. In Papua New Guinea, where overall telephone density is only 1.31 per cent of the population, PNG Telikom has been corporatized but remains the sole provider of telephones. It is more advanced than other telecommunication operators in the Pacific with high penetration throughout the countryside and is moving to a digital system at present.

Box 3. Using ICT for development in the Pacific: diminishing distances *(continued)*

Smaller Pacific island economies face more problems because of economic and human resource constraints in addition to the remoteness of their territories. Internet access in most Pacific island economies remains difficult and expensive and there is usually a monopoly Internet service provider (ISP), meaning that it can set tariffs without competition. However, some smaller economies have been remarkably successful in embracing the Internet revolution. For instance, Tonga had its first Internet connection in 1997 with assistance from Cable and Wireless, Tonga. A new telephone exchange was set up in 1999 to improve quality and services and Tonga now has an overall telephone density of 7 per cent (but only 2 per cent in rural areas). Telecommunication is further promoted through recent liberalization of the sector to promote competition allied with deregulation measures to attract foreign direct investment (FDI).

Despite constraints, ICT has the potential to assist in overall development in many of the Pacific island economies. Some areas where ICT can make a difference are:

- ICT can be used to provide accessible public services which are client-oriented and formulated according to the needs of the clients instead of providing them with what public servants çthinké they need. For example, the University of the South Pacific has a distance learning programme in most of its member countries which tailors courses according to the specific situations in the country. Also, the Asia-Pacific Development Information Programme, in collaboration with Cisco Systems and UNDP, has begun a training programme for IT skills in developing countries. The APDIP-UNDP-Cisco Systems Networking Academy programme currently has education courses in nine countries including Fiji and Papua New Guinea. A combination of traditional and web-based methods is used to develop IT skills to allow students to develop and maintain networks.
- The use of ICT can assist Governments in making decisions about important purchases and contracts. For example, the Government of the Solomon Islands used the Internet to research the previous work and performance of international contractors bidding for a government contract.
- ICT can assist in increasing government transparency by allowing interaction with the public and by allowing Governments to disseminate information about laws, regulations and meetings.
- ICT can be used to assist in the development of small and medium-sized enterprises (SMEs) by providing information on regulations, potential markets, commodity prices, business plan formulation, online training, expert advice and marketing. The cost of providing all these services through the Internet would be more economical and more convenient for service providers and for recipients than printing numerous training manuals and booklets and transporting them to remote areas and outlying islands for dissemination.

The potential for using ICT for development has been recognized by the international community in its work in the Pacific island region. The Japanese Government initiated the "Miyazaki Initiative", which aims to provide multifaceted programmes to the Pacific including assistance in capacity-building, information technology promotion, bilateral and multilateral cooperation and increasing awareness of and dealing with regional and global issues in trade and environment. UNDP is active in promoting the use of ICT in developing countries through programmes such as the Sustainable Development Networking Programme <*www.sdnp.undp.org*> and has an extensive online library of initiatives and programmes for the use of

Box 3. Using ICT for development in the Pacific: diminishing distances *(continued)*

information technology in developing countries <*www.sdnp.undp.org/observatory*>. Other multilateral organizations have also formulated plans for IT development in the Pacific island economies, including the proposed ESCAP project on trade and investment promotion through information technology use.

Some recommendations for overall ICT use in assisting development in the Pacific Island economies include:

- There is a need to simplify government regulations on entry of new firms into the telecommunication sector and in the overall economy so that foreign investors can invest easily.
- Information on Government services and activities should be provided online so that the public can determine the workings of their Government and also provide input on their needs.
- The participation of the private sector should be promoted because the use and dissemination of ICT is an area where the private sector has the potential to play a leading role. Government and private-sector partnerships in telecommunication have already led to successful efforts at increasing connectivity, developing human resources and building up infrastructure in many Pacific island economies such as Fiji (with Fujitsu) and Tonga (with Cable and Wireless, Tonga). These examples could be followed in other Pacific island economies.

Box 4. ICT in China: prospects for a big boom

Because of China's massive population and large land area, ICT prospects are very promising for the future. In fact, ICT growth is likely to "boom" in China in the next few years. Evidence of this is already available as Chinese telecommunication companies are the largest in the world in terms of the number of subscribers. At the end of 1999, China ranked second among all economies in the world in terms of fixed telephone line network with 109 million subscribers. In addition, it had the highest average annual growth rate among the top 10 largest countries in the world at 26 per cent. In the mobile phone market too, China showed rapid growth and had the world's third biggest mobile market with over 43 million subscribers at the end of 1999. Subscribers grew at an astounding annual average of over 85 per cent between 1996 and 1999. For Internet provision, China was the seventh biggest market in the world with around nine million users at the beginning of 2000. China Telecom, which is the sole provider of fixed-line communication in China, is the world's largest fixed-line operator, while China Mobile, one of two providers of mobile services, is the world's largest mobile phone operator in terms of number of subscribers <*www.itu.int/journal/200009/E/html/Indicat.htm*>. Thus, China's telecommunication industry has shown rapid development and amazing growth in recent years. This growth was fueled by high FDI and infrastructure development.

Despite the rapid growth of telecommunication in China, many constraints remain. Overall telephone density is still relatively low at just over 8 per cent overall and much lower in rural areas ("China country profile", in *APT Yearbook 2000* [United Kingdom, Surrey, ICOM Publications Ltd.,2000]). Internet provision is limited because of a popular perception of the Internet as an "expensive pastime" rather than as a tool for information gathering and dissemination. Slow access, uncertain connections, limitation of online content in the Chinese language and a lack of skills in using the Internet all add up to decrease the average Chinese

Box 4. ICT in China: prospects for a big boom *(continued)*

person's interest in the Internet. The strict regulations and existing censorship mean many international investors hesitate to enter the Chinese market. ISPs can be shut down if postings and discussions of government information are found on their facilities. E-commerce is still in its infancy and surveys showed that many small businesspeople did not trust the security and privacy of the Internet to conduct business and financial transactions online.

However, as explained earlier, telecommunication in China is expected to grow further at a rapid pace, especially after China's entry into WTO. Prospects for foreign investment will increase after ownership rules are eased in the wake of WTO entry. But the focus of investment should not only be on prosperous, urban areas but also on increasing the rural population's access to information. The Government has also recently formulated an Internet security law (December 2000) regulating Internet content in the hopes of increasing security for users. It is estimated that China will have 7.1 per cent of the total Internet users in the world in 2004, more than twice as many as any other Internet market in the region. The number of Internet users is estimated to triple between 2001 and 2004. E-commerce, while relatively limited at present, still generated revenue of around US$ 2.1 billion in 2000 and the figure is estimated to grow to US$ 26 billion by 2004, making China the third largest e-commerce market in Asia ("The Net is red", in *IT Forecaster,* 6 March 2001. Available online at <*www.idc.com/itforecster/itf20010306.htm*>.)

For the future, a collaborative effort between the Government, private sector and international organizations for efficient use of ICT and for appropriate dissemination into rural areas is needed. Some efforts have already been made to use ICT for development purposes. For example, UNDP is collaborating with China's Ministry of Science and Technology in a pilot project to show how new ICTs can be accessed and used for poverty reduction in rural areas. ICT centres are to be established in five counties across China. These community telecentres in rural areas will provide a range of services focused on the needs of rural residents. Farmers will be able to check information on market prices for their products, read weather forecasts and learn about new agricultural technologies while other rural residents will be able to access information as needed. In addition, these telecentres aim to assist in increasing government transparency by providing an interactive forum for information exchange between the local people and the local administration on policies and services (" China Harnesses the Internet to reduce rural poverty", in *United Nations Development Programme: Newsfront – UNDP's Daily News Feature*, 8 March 2001 <*www.undp.org/dpa/frontpagearchive/2001/february/23feb01/index.html*>*).*

Box 5. Increasing access to information in the Russian Federation: still a long way to go

During the Communist era, telecommunication in the Soviet Union was centralized. The Government oversaw telecommunication policies, procurement and network installation and had its own technical research and development institutes. In fact, the Government was wary of communication facilities for its population and preferred to exercise a strict control over such facilities. After the break-up of the Soviet Union, communication facilities disintegrated with the end of central planning. Telecommunication infrastructure was fragmented with the Russian Federation retaining most of the infrastructure and other economies in transition often worse off. The new focus was on attracting modern technology and integrating into the global information and communication technology grid, as part of the Russian Federation's desire to integrate into the regional and global economy.

The growth of telecommunication in the Russian Federation was rapid after the break-up of the Soviet Union. This was especially evident in the rise in the numbers of Internet users. The number of Internet users in the Russian Federation at the end of 2000 reached 3 million, up from 600,000 in 1998 ("Russian journalists spread wings online" by Alex Ulmanu in *Online Journalism Review*, 4 January 2001. Available at <*http://ojr.usc.edu/content/story.cfm?request=512*>.) While this is still a relatively low figure compared with economies in Europe and North America, it represents a huge figure in an economy where Internet usage is still expensive and mostly concentrated in the larger cities. The increase in the use of the Internet was fuelled by a need for more information and assisted by the development of Cyrillic encryption, which made establishing, accessing and reading Russian language web sites easier for ordinary Russians. Despite the high growth of Internet users though, penetration is limited to major cities and accessing the Internet is still very expensive. There are problems with accessing the telephone lines and hardware is usually beyond the income of most ordinary Russians. In 1998, telephone density was only 14 telephones per 100 persons, a figure comparable to developing economies in Asia and the Pacific.

In addition, reform of the telecommunication sector in the Russian Federation has been slow, hindered by political interests and slow reorganization. Even after reorganization, the Government retained control over the national telecommunication system. Svyazinvest, which now controls most of the Russian Federation's telecommunication operators as well as its biggest long-distance operator, plans to reorganize its various local operators but retain controlling interests.

Similar to the focus in developing economies, appropriate use of ICT for development in the Russian Federation has to concentrate not on "connecting" each single user to the Internet but on providing access to the majority of the population, especially in rural areas and in areas outside the larger industrial towns. Some positive signs of Internet dissemination outside the capital were evident to Erik Herron, a Michigan State University staff member, who has conducted research on information technology access in the former Soviet Union. He reports an anecdote where a local NGO representative from Moscow was travelling in a small town in the remote areas of the far north in the Russian Federation. He took a cab and the driver began to complain, "I heard some news on the Net recently. They said safety belts are no longer necessary in cars. When I met a policeman and had to pay big bucks, I realized that it was somebody's stupid joke! I hate Internet chat rooms!" (More information and papers from Erik Herron's research can be accessed at <*www.msu.edu/~herrone2/IT/it_access.html*>.) Despite this example of a cab driver who regularly accessed

Box 5. Increasing access to information in the Russian Federation: still a long way to go *(continued)*

the Internet from the remote regions of the far north, access to ICTs in the Russian Federation remains slow and the Government faces substantial barriers in improving telecommunication infrastructure and making the technologies more affordable for the majority of its citizens.

For more information on ICT in the Russian Federation, see: The Institute of the Information Society - Russia web site, which has an overview of its projects, policy papers on IT and documents on the development of ICT, at <*www.iis.ru/index.en.html*>.

Box 6. ICT in Viet Nam and the Lao People's Democratic Republic: developing slowly but surely

Viet Nam and the Lao People's Democratic Republic are both in the transition phase of moving towards a market-oriented economy from previous centrally-planned systems. As a result, their priority has been on economic growth rather than on increasing access to telecommunication. Recently, however, it has been realized that telecommunications and use of ICT can facilitate overall development including fostering economic growth. As a result, both economies, assisted by bilateral and multilateral agencies, have begun to formulate programmes on information technology.

ICT growth in both economies is constrained by a lack of infrastructure and by outdated existing technology combined with a lack of human resources. For instance, the Lao People's Democratic Republic, classified as a least developed country (LDC), has a very low telephone density of 0.7 per cent overall and an even lower 0.13 per cent in rural areas. The situation is slightly better in Viet Nam, where the overall telephone density is 3.2 per cent. Viet Nam is moving ahead with rapid telecommunication development. In 1999, Internet charges were reduced as were charges for international telephone calls, leading to easier access to ICT and increased competition among providers. Since Viet Nam was connected to the Internet in 1997, over 60,000 users have signed up with four ISPs. Also, the largest transnational corporation (TNC) in the country, Telstra, is a telecommunication company. Government plans for ICT promotion include a project to build a software technology zone in Ho Chi Minh City, where the overwhelming majority of Viet Nam's Internet users reside. This zone would specialize in producing software and technology and assist in producing Internet transmission lines. However, a large bureaucracy and slow implementation of regulations still act as obstacles. Despite numerous joint ventures in the telecommunication industry, the Government retains ownership of the network.

But ICT development in Viet Nam is still far ahead of the Lao People's Democratic Republic, which faces more challenges as an LDC. While a project on rural telecommunications was established with German assistance, problems between the Government and the contractor delayed many of the proposed results of the project. Things have been cleared up recently and the project has recently entered its third phase. The development of telecommunication in the Lao People's Democratic Republic is also slowed down by expensive overseas dialing charges. There is no direct overseas dialing.

Both Viet Nam and the Lao People's Democratic Republic are part of the Pan Asia Network, an electronic network promoting the use of ICT for sustainable development with hubs in developing countries in the region. More information on Pan Asia is available at <*www.panasia.org.sg*>.

1. Various models of ICT dissemination in rural areas

The need for increasing ICT access in rural areas, especially in developing countries in the Asia-Pacific region, is acute. Sixty-five per cent or around four billion of the world's total six billion population live in rural areas. Also, four billion people in the world have never even used a telephone in their entire lives. In many countries, the demand for telephones and other communication services outpaces supply with the telecommunication operator usually swamped with requests but hindered by lack of resources to fulfill them. Telecommunication operators in developing countries also often concentrate on urban areas because of the relative ease with which ICT can be disseminated there as compared with rural areas, where infrastructure is usually non-existent and geographical and human resources constraints are high. Rural telecommunication, until recently, suffered from a perception that it was low in commercial value and had high costs. Thus, the private sector was uninterested.

But recently, the rise of mobile telephony and satellite communication has given a new impetus to the involvement of the private sector in rural telecommunication. Services such as Asia Cellular Satellite System, which provides mobile telephony and data services that allow customers to communicate through digital signals and access voice, fax and data services, are opening up.

Box 7. Satellite phones saving lives in Nepal

When a huge fire damaged the remote village of Kalikot in western Nepal, the news was in the national media the next day and food and assistance arrived within a few days. In the past, this would have been unthinkable, as villagers would have had to walk for days to reach the district headquarters to make a phone call to the capital city, Kathmandu. But, because of Nepal's nationwide network of microwave repeater stations, which link most of the country by telephone, a quick phone call was all that was needed to lead to rapid response from the capital. In a country where the surface rises from 100 metres above sea level in the southern plains to nearly 9,000 metres at the top of Mount Everest, all within a horizontal distance of 100 kilometres, it is necessary to find innovative ways to connect the numerous small villages. Making roads through high mountains and deep valleys and especially setting up telephone lines across the valleys and gorges and through the mountains is not only difficult and slow but also very expensive. Satellite telephony is thus seen by many to be the answer to the problems faced by countries like Nepal which have geographical and infrastructural limitations slowing down the conventional dissemination of telecommunication.

However, there is a price to pay for satellite telephony. It is expensive. Even a relatively cheap service such as Asia Cellular Satellite System, an advanced mobile telephony and data service, charges around US$ 1 per minute, which is still very expensive for a country like Nepal, where the annual per capita income is around US$ 200. Other similar services such as Globalstar are also expensive with handsets alone costing between US$ 800 and US$ 1,400. Thus, satellite telephony alone is not a viable proposition for developing countries like Nepal despite the high benefits it can provide. Experts recommend a combination of wire-based, wireless and satellite services should be implemented with assistance and collaboration from government, international organizations and, especially, private-sector telecommunication companies for an effective and efficient rural communication network leading to sustainable development.

Source: NepalNet at <*www.panasia.org.sg/nepalnet*>.

Various projects and programmes seek to improve both connectivity and accessibility in rural or disadvantaged communities by providing various levels and types of public ICT services. The "models" of service provided can be broadly grouped into the following categories:

(a) *Public call offices (PCOs)* - Voice telephony service to the public provided via fixed line or wireless technology. Usually provided through the resale of telecommunications operator services under franchise.

(b) *Telecentres* - Physical space providing telecommunication services to the public encompassing more than one telecommunication service ranging from voice telephony to fax, Internet and videoconferencing services. Telecentres often provide additional information services (e.g. in the area of health, education and government services) as well as user training. The description includes the multi-purpose community centre (MCT) model, which provides facilities and support for a wide range of community services. This type of telecentre requires the involvement of various institutions for the information processing and dissemination activities. Telecentres may support networking or cooperative e-commerce activity.

(c) *Electronic information/networking centres* - Physical spaces providing telecom-munications services targeted at specific areas of economic activity with the objective of providing information, e-commerce or networking opportunities for the specific target group. The overall objective is usually to increase production and income.

2. Best practices

Using sustainability and impact as two key indicators of success, certain projects and programmes stand out as being particularly successful based on a review of the available literature. These projects and programmes are outlined in annex 1. Factors which have been identified as contributing to their success and which may be replicable in other initiatives are used to identify the following "best practices" for promoting access to ICTs in rural or disadvantaged communities:

(a) *Use innovative approaches and create the right regulatory environment to encourage telecommunication operators to expand services to rural or disadvantaged areas to support project/programme initiatives (Vodacom telecentre franchises (7)).*

The recent rise in the profitability of rural telecommunication has increased private-sector interest in telecom provision in rural areas. The involvement of the private sector in ICT dissemination is essential because it has better resources and skills. Thus, government regulations should facilitate private-sector entry. The International Telecommunication Union (ITU) points out the positive impact that liberalization of the telecommunications market has had on the accessibility of ICTs in general. The structure of the market is also important in determining the accessibility of ICTs in rural areas. For example, the Indian market is fragmented into regional licences for telecommunications operators and so operators cannot achieve economies of scale and subsidize rural areas from more lucrative urban operations. However, in China, licences are granted nationwide and the two operators have provincial subsidiaries, which allows focus on regional markets and economies of scale to coexist. In this environment, mobile phone use has shot up in China, while in India it has remained almost static.[18]

[18] *ITU News*, Special Edition, November 2000.

Where a telecommunications operator cannot be attracted to an area by potential profit, other policies will be required.[19] Even where leadership by the telecommunications operator does not currently seem feasible,[20] partnership and collaboration should be sought. The point has been made that existing carriers may resist what they see as competition from telecentres operating without their direct investment, involvement and control and may fail to support or accept telecentre projects. In Bhutan, the MCT supported by ITU is managed by Bhutan Telecom.

(b) Promote the dissemination of ICTs via franchising of services to individual entrepreneurs or NGOs (Vodacom telecentre franchises, South Africa (7), FOOD project (2)).

The franchise model has been successful in terms of increasing connectivity and accessibility, ensuring financial sustainability and bringing benefits directly to the local community. Successful rural telecommunication franchises which have contributed measurably to the GDP or to the incomes of telecom operators and franchisees are reported from South Africa, Senegal[21] and India (Punjab).[22] In South Africa and Senegal, the telecommunications operator has decided not to install public pay phones, but instead to support franchised call centres as small businesses. The Foundation for Occupational Development (FOOD) is an Indian NGO which provides telecentres with computers, communications equipment, training and day-to-day support on a franchise basis.

(c) Link telecommunication operators with microcredit facilities provided by existing and successful microcredit organizations to provide services on a franchise basis (Grameen Village Phone programme (1)).

In this type of arrangement the franchisee has access to a low-cost small loan to start providing telecommunications services in his/her community as a small business with technical and other support from the telecommunications operator, which retains a portion of the charges generated. For instance, the Grameen Telecom Village Phone programme is a commercial operation that provides cellular services in both urban and rural areas of Bangladesh in a partnership between a well-known microcredit lending facility, the Grameen Bank, and the telecom provider Grameen Telecom (in cooperation with Norwegian Telnor). Small loans are provided by Grameen Bank to acquire cellular phones and resell telephone services within villages on a commercial basis. This arrangement directly benefits both the community and the telecom operator. An evaluation in March 2000 showed that the programme "yields significant positive social and economic impacts, including relatively large consumer surplus and immeasurable quality of life benefits". The income that village telephone operators derive from Village Phone was estimated to be 24 per cent of household income on average and in some cases as high as 40 per cent. In addition, telephones in the programme earn three times as much income as urban cellular phones.

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[19] Marlee R. Norton, Michael S. Tetelman, Christiane Brosnan, Maria A. Kendro, Brian Bacon, Patrick Lohmeyer, Richard Fuchs and Kristi Mc.Bride, *Initial Lessons Learned about Private Sector Participation in Telecentre Development: A Guide for Policy Makers in Developing Appropriate Regulatory Frameworks* (Virginia, Arlington, National Telephone Cooperative Association, *<http://www.ntca.org/intl/FINAL.txt>).*

[20] As technology and infrastructure improve and companies seek to promote value-added services for greater profit, the demise of donor – or public-sector-driven projects is predicted by some *<http://ces.iisc.ernet.in/hpg/envis/doc98html/infotel9936.html>*.

[21] Peter Benjamin, *Telecentre 2000 Report* (*<http://www.communitysa.org.za/docs/intafrica.doc>).*

[22] Johan Ernberg, *Universal Access for Rural Development – From Action to Strategies* (International Telecommunication Union, December 1998, *<http://www.itu.int/ITU-D-UniversalAccess/johan/papers/NTCA_johan.htm>).*

(d) Provide support to NGO/CBO/not-for-profit-organization-led projects/programmes that focus on increasing the accessibility of ICTs and providing value-added services where the lead organization has strong existing linkages with the local community and will be the main manager of the facility (FOOD and MSSRF projects (2) and (4)).

Local organizations are more likely to receive community support. In India, the Foundation for Occupational Development (FOOD) has taken on the role of Internet service provider (ISP) to 14 subhosts. The subhosts are provided with technical and content support by FOOD until they become self-supporting. Each subhost has between 100 and 300 users, which are mostly NGOs. Eleven individual telecentres have been created within the network. The project has been described as having a unique business-like approach, the success of which is attributed to the personal relationships between FOOD and its clients. This model, it has been stated, offers a "rare example of sustainable development communications capable of being replicated in other wider contexts". The MS Swaminathan Research Foundation (MSSRF) has established Village Information Shops in Pondicherry, India, to enable rural families to access information using ICTs, supported by the International Development Research Centre (IDRC). The Village Information Shops also provide training to youth in operating the shops and providing relevant content as well as maintaining, updating and disseminating information on entitlements to rural families using various approaches. The ICT benefits identified earlier were almost all experienced in the target communities of these two projects.

(e) Combine "old" media with new to increase project outreach and impact as part of an overall marketing strategy (FOOD (2), MSSRF (4) and Chinese (5) projects).

Several successful projects have successfully employed this strategy. This is particularly important where a lack of information in the local language is a problem. Services provided should be based on a realistic assessment of the community's needs and the levels of literacy. Given the usually high costs of ICT projects, adequate usage and impact are paramount and a combination of communication media makes the service available to the largest proportion of the community possible. Where the telecentre depends on income generated from its services, this could be critical. Even where it has been established with donor assistance, operating costs are not usually covered. It is also important to promote local relevance. In places where the literacy level of the population is low, multimedia-based graphics-oriented programming and content can assist in increasing access and use of ICTs.

(f) Generate relevant information in the most efficient manner possible - on a centralized basis at an information hub or using networks of relevant organizations/ institutions (FOOD (2), MSSRF (4) and RCP (6) projects).

The telecentres established by the Peruvian Scientific Network (RCP) are run on a franchise basis by a non-profit organization. They offer information content (such as health, education and business) developed by the network of institutions which are members of RCP, comprising universities, schools, research institutions, NGOs and other entities.[23] The initiative is described as

[23] Three different levels of service are provided - "Mother Infocentres" operated in major cities, providing training and marketing services, and owned by RCP (25 established by 1999); telecentres in smaller towns, franchised owners which are non-profit organizations or corporate bodies, with equipment, training and general support provided by RCP (by 1999, 250 had been established). The local owner runs the business and pays around US$ 1000 per month to RCP; and "monocabinas" (in 1999 there were reportedly 250 in rural areas - one computer, printer, phone and modem). Also, see José Soriano, *Systematization of the Peruvian Scientific Network Experience* (Red Cientifica Peruana [RCP] <*http://www.isoc.org/isoc/whatis/conferences/inet/96/proceedings/g5/g5_2.htm*>).

being very successful. Starting in 1992 with US$ 3,000, income from regular operations amounted to US$ 6 million in 1999. An estimated 300,000 persons were users of the telecentres in 1999. There has been reported interest in the development of a similar service from El Salvador, Costa Rica and three African countries.[24] In another successful project, a Chinese satellite network of county stations collects and disseminates trade information processed centrally and, after one year of operation, was reported to be profitable. The MSSRF project has established one telecentre as an information hub for the four other information centres which have wireless e-mail services. This arrangement offers substantial cost savings since full Internet access is not provided to all of the centres and information requests are processed at the hub.

(g) Provide information on government services (MSSRF (4) project).

Using new technology to provide information on basic government services such as health care, information for farmers and other essential support services in rural areas will make such services more relevant for the people concerned and increase the use of ICT. The government could also ask for public input into the governance process, thus creating more participatory governance. For instance, Nepal's forthcoming IT Strategy evolved after numerous discussions including an online information exchange. Similarly, information on government policies and services, provided in local content and languages, will broaden access to ICT and increase the efficiency of such services. The MSSRF project has been doing this in India.

(h) Involve women in providing ICT services (MSSRF (4), FOOD (2) and Grameen Village Phone projects (1)).

In order to ensure equitable service provision, the involvement of women in ICT is essential. An approach such as that used by one MSSRF telecentre which alternates women operators with men would be helpful in increasing women's access to and usage of ICT services while ensuring the men do not see themselves as marginalized. For women MSSRF telecentre operators that the work has improved their status within the society and has encouraged other women to use the services offered. ICTs can therefore be a powerful tool for the empowerment of women in the rural context. An increased number of health-related enquiries has been observed when women operate the MSSRF telecentres. An evaluation of the Grameen Phone project found similar results; it was also noted that the gender of the Village Phone operator and the physical placement of the phone could either inhibit or improve women's access to the service. This is important both from the standpoint of revenue generation, profitability and sustainability and from the standpoint of ensuring equitable service provision.

(i) Use the appropriate technologies (Grameen Village Phone project (1)).

Various technologies are used for accessing telecommunication networks, depending on the available telecommunications infrastructure. The technology used will determine the quality of the services and, depending on the way in which the project is financed, the cost of the service. Services must be provided at a cost that approaches their true cost while remaining accessible to the majority of the target population. This is critical for the sustainability of the project. Technological options aside from fixed-line technology encountered in the more successful projects include:

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[24] <*http://www.sn.apc.org/community/models.htm*> – Web site for community information and communication technology projects in South Africa, developed and supported by the Southern African Non-Governmental Organisation Network (SANGONET) National Information Technology Forum. Also, see Yuri Herrera Burstein, (Red Cientifica Pruana [RCP] <*http://www.idrc.ca/telecentre/evaluation/nn/BIOS\HerreraY_11.HTML*>).

- *The GSM cellular phones* used by the Grameen Telecom project, while viewed as fairly expensive, were suited to the infrastructure and regulatory environment in Bangladesh. In this successful project, the technological choice reflected the available telecommunications infrastructure, the customer's ability to pay and access to financing for the project. The potential of cellular technologies is increasingly being recognized. The involvement of the private sector is crucial for dissemination of these types of services.

- *Pre-paid cellular* phone technology has been upgraded by Vodacom to include fax and other data communications, contributing to the quality of service and management of the franchises. *Vodacom's community phone recharge system* technology developed by the company allows community phoneshop franchisees to buy bulk airtime, allowing entry for these small operators to enter the formal economy for the first time.

- Other technological options include *modular telecommunications* facilities, for example, LINCOS developed by the Massachusetts Institute of Technology. LINCOS includes computers, modems, solar panels and satellite dish antennas and was first installed in January 2000 in Costa Rica. LINCOS installation can cost up to US$ 100,000 per module, much of which represents training costs. Seven more modules have been installed since then.[25] Another modular system with similar technology but also including water purification systems is available through Greenstar, a commercial operation.[26]

[25] Adam Piore and Ron Moreau, "A Global Gap", *Newsweek*, 29 January 2000.

[26] <*http://www.greenstar.org/introduction.htm*>.

3. Lessons learned

The most important lessons learned from the experiences of other projects which have been less successful or which have encountered particular difficulties include the following:

(a) Pay appropriate attention to the management aspects of the project, including strong project management and monitoring, improved clarity and communication regarding ownership, support levels, complaints handling and clear guidelines on tariffs. This is critical where the project is not NGO- or private-sector-led and involves a number of partner organizations. This is highlighted by the experiences of the South African telecentres established by the Universal Service Agency.[27]

(b) An appropriate business model, marketing efforts and user training will be required to stimulate demand and thereby increase income for projects using ICTs, as demonstrated by evaluations of MCT projects in Suriname, Mexico[28] and in South Africa,[29] which have closed down or encountered great difficulty even though, in some cases, they had substantial donor support. It is necessary to visualize ICT projects as an integrated concept which can work in conjunction with marketing, sales and education provision instead of seeing them merely as communication tools. The successful Indonesian "wartels" programme, a network of more than 6000 neighbourhood telecommunications shops throughout Indonesia, has been seeking new products and services to be

[27] Fikile Khumalo (Acting Director, Universal Service Agency [USA], South Africa), *Preliminary Evaluation of Telecentre Pilot Projects* (International Telecommunication Union [ITU] <*http://www.itu.int/ITU-D- UniversalAccess/evaluation/usa.htm*>).

[28] Scott P. Robinson, *Telecentres in Mexico: The First Phase* (United Nations Research Institute for Social Development [UNRSD] <*http://www.unrisd.org/infotech/publicat/robi/robi.htm#P78_13875*>).

[29] Esme Modisane and Nebo Legoabe, *Mamelodi Community Information Services (MACIS) case study* <*http://www.centratel.com/library.htm*>.

sold by its members as a means of generating additional revenue. Other sources of income being explored are advertising space and electronic tourism displays.[30]

(c) Provide appropriate levels and types of service at affordable cost. In the telecentre pilot projects established by the Universal Service Agency in South Africa, computers are not optimally used except during training activity. Scanners and overhead projectors, at the time of an evaluation in 1998, had never been used. Thus, it is essential to determine the needs of the local people and tailor an ICT project accordingly instead of assuming that the needs are evident and imposing a project externally that may not reflect community needs.

(d) Adequate training and technical support are essential. Technical problems must be avoided and addressed through technology choices and training. Hardware and software problems are reportedly a major challenge to the provision of services in several telecentres. In Suriname, technical problems and limitations, including the use of cellular network technology unsuitable for applications requiring higher bandwidth and solar panels which generated insufficient power, have been included among the reasons for the failure to achieve the project activities. Human resources training for using and maintaining the ICT software and hardware is needed for sustainable use after donor or private sector involvement is over.

Other factors which will influence the sustainability of the project or programme are:

- Security of equipment: the local community has to perceive a stake in the project so it will be interested in providing security and maintaining the equipment.
- Competition (current and possible future). Some MCTs have identified competition from normal payphone services or other initiatives. It is essential to remain viable and competitive through adding value to services and expanding the use of ICT.
- Technological and regulatory environment change: Government policy should consider the impact on successful ICT projects as an important factor where such projects are envisaged to play a key role in providing ICT services in rural areas.
- Energy supply needs to be considered along with the introduction of ICT to rural areas. In Mongolia, telecommunications offices and some microwave radio repeater stations are supplied by photovoltaic energy power systems.

C. Applications for poverty alleviation in rural and disadvantaged communities – recommendations for the Asia-Pacific region

Poverty is a multidimensional problem encompassing not only material deprivation but deprivation in health and education opportunities. The state of poverty also implies vulnerability to external events, exclusion from a voice and power in institutions of state and society, i.e. a lack of empowerment.[31]

Making information technologies accessible to all has the capacity to empower people by

[30] American Express Small Business Exchange web site. Feature article on Indonesia. 02.02.2001 <*http://home3.americanexpress.com/smallbusiness*>. Conceived more than 10 years ago as part of the Government's drive to foster the growth of strong small businesses, the wartels fill an important niche in Indonesia, where telephone penetration has only recently passed two per hundred persons. However, it is reported that the bureaucratic process of obtaining the necessary operating permits restricts access to this business opportunity.

[31] *World Development Report 2000/2001: Attacking Poverty* (World Bank , April 2001 <*http://www.worldbank.org/poverty/wdrpoverty/report*>).

removing long-standing barriers to social and economic development in the form of a lack of access to information, financing and markets in practically all areas of human social and economic welfare. The following recommendations in applying ICTs are based upon examples of ICT application which have had a tangible impact in particular areas.

The point has been made that one overriding characteristic of the results of ICT application in remote areas is that they are not predictable and depend on how people use the technology and the information accessed. A key theme running through the various success stories, therefore, is the *empowerment* of local people to use ICTs for their own benefit.

1. Job creation

(a) Assess human resources available and employment needs in the target community and tailor the ICT services appropriately

In India, the Loyola Joseph Telecentres focus on providing telecommuting jobs (writing, translating, data entry, etc.) and are owned on a franchise basis with the network providing Internet connections and information services. Each telecentre is estimated to have provided around 50 jobs.[32]

(b) Assess indigenous knowledge and skills existing in the target community and use ICT to add value to these resources for the benefit of the target community

In the village of Thandarai, Pondicherry, India, women have capitalized on their knowledge of herbal remedies with the assistance of the NGO Womankind Worldwide. A telecentre established with connectivity support from FOOD has facilitated the establishment of a herbal processing centre. Around 300 women from the surrounding district are engaged in the herb preparation process and there is an effort under way to record local knowledge about herbs. Another MSSRF telecentre is facilitating the establishment of a database of such remedies, which is accessible by other villages.

(c) Maximize the use of ICT networks to increase job opportunities in the local or regional context, targeted to rural or disadvantaged communities, keeping in mind possible impacts on rural populations

The MSSRF telecentre network is the channel of first choice to obtain local labour for an agricultural processing factory in a nearby village. The factory therefore has access to a steady supply of labour quickly and cheaply and the villagers have the first opportunity at jobs when vacancies arise. The arrangement arose when a villager heard of the opportunity and used the village telecentre to inform other villagers, with the result that the factory was able to meet its labour needs very quickly.

2. E-commerce

E-commerce is often cited by Internet advocates as an important way of reducing poverty levels in the developing world. There are several definitions of e-commerce[33] but when it is viewed as encompassing any transaction involving the transfer of information, products, services or payments via electronic networks, the following recommendations can be made:

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[32] <*http://www.sn.apc.org/community/models.htm*>– Web site for community information and communication technology (ICT) projects in South Africa, developed and supported by the South African Non-Governmental Organisation Network (SANGONET) and the National Information Technology Forum (NITF).

[33] *Building Confidence: Electronic Commerce and Development* (UNCTAD, 2000 <*http://www.unctad.org/en/docs/posdtem11.en.pdf*>).

Box 8. SME and E-commerce

SME in developing countries and rural areas which make commercial items such as clothing footwear, leather goods and furniture may not reap the same benefits from electronic commerce as craftsmen and artisans, the critical factor in thsi market being the consumer's willingness to pay maore for a unique craft item and to assist the artisn.

The marginal benefits from accessing the world market via the Internet may be lower, unless specialty products or innovative designs and services are offered. The Internet may-be uxed as a tool to access international design expertise and quality control standards, however, and thi is already being done to assist some SMEs in entering OECD market. The point has also been made that while establishing an Internet storefront can be relatively low in cost, marketing can still be quite costly. The experiecne in the OECD countries has shown that marketing via traditional media connot be replaced be even the best e-marketig strategy.

While the benefits for SMEs in developing countries are still unclear in the "business-tp consumer" market, companies in the developed countries as well as in Asia are beginning to take advantage of the cost saving and effeciency offered by the use of ICTs in their business processes and, in particular, in procurement. This is one area of trade in which an "e-ready" SME in a developing country offering a product of acceptable quality and able to meet logistical requirements can be competitive. For instance, market research in the Philippines reveals that there are around 23,000 Philippine small businesses well suited to establishing electronic stroefronts, industry knowledge resource centres and electronic data storage, posting product catalogues and sharing experiences with peers. In this respect, assistance should be extended to SMEs in priority sectors in which the business-to business market offers the greatest opportunities. In turn, SMEs within developing countries can increase their competitiveness by using ICT to obtain inputs into their production process from a wider market, i.e other e-ready SMEs.
(IFC websie: <*http://www.ifc.org/publications/pubs/impact/spring00/web/web.html*>)

(a) Identify ongoing commercial activity and use information available via ICTs and ICT networks to add value to this activity and increase benefits to the target community

A group of women in Kizhur village in Pondicherry, India, have used the MSSRF telecentre to develop the necessary skills for packaging and marketing their own brand name incense based on their previous venture as subcontractors. They quickly developed local outlets for their products and are using the telecentre to seek out more distant customers.

(b) Use ICT to explore and maximize local markets

A satellite dish provided by the Canadian Government, the local telephone company and a Lima-based non-profit organization as well as eight weeks of training have allowed the Ashaninka Indian village in central Peru to use the Internet to sell organically grown oranges in Lima. This has boosted tribal revenue by 10 per cent.[34]

(c) Use ICT to take advantage of developed country markets for alternative trade products based on local skills

Arts and crafts from low-income communities are being sold to lucrative northern

[34] Anthony Faiola and Stephen Buckley, "Poor in Latin America embrace Net's promise", reprinted from the *Washington Post*, Sunday. 9 July 2000, p. A01 <*www.digitaldividend.org/other_exp_temp.asp?name=24*> or < *http://www.washingtonpost.com/ac2/wp-dyn?pagename=article&node=&contentId=A1693-2000Jul7*>.

markets via "alternative trade" web sites, such as PEOPLink <*www.PEOPLink.org*>[35]and the Virtual Souk <*www.elsouk.com*>[36] serving the 'business-to-consumer' market. These ventures are supported, in part, by international organizations such as the International Finance Corporation (IFC) and the World Bank. In general, these web sites seek to add value to the products by providing the purchaser with information on the origin and significance of the product and, in some cases, the individual craftsperson producing the article being purchased. Customer satisfaction is derived from knowing that the purchase will help low-income communities while rural artisans can use their traditional skills and knowledge to increase their income.

3. Support to small business/ agricultural activity

(a) Make market price information available to small business/agricultural activity

The UNCTAD commodity risk management programme seeks to increase the transparency of price formation for commodities through online access to commodity exchange prices. Producers have a better idea of the price formation mechanism and the proportion of the price which is "fair" for them to receive as well as how to improve this price through quality control. Small producers can therefore bargain with traders based on information facilitated by the use of ICTs. Producers of primary commodities such as cocoa, coffee, cotton, jute and sugar can benefit from this service, which has mainly been applied in Africa. Many hand-held Reuters screens or mobile phone links are in use to check prices.

An MSSRF telecentre at Kizhur, Pondicherry, India, assists farmers in locating suitable sources of quality seeds and ensuring adequate supplies for the farmers at the time when they need them. In the village of Embalam, India, local farmers obtain the market prices for their produce on a daily basis from the village telecentre, which gives access to both government and private market prices, which can differ. The farmers therefore consistently obtain the best possible price for their produce.

(b) Use ICTs to provide technical support to agricultural producers through agricultural credit and other appropriate organizations

In a pilot project in India, primary agricultural credit organizations were provided with hardware, software and content and maintenance support in return for a monthly fee. Farmers were provided with information on agricultural practices and methods and fertilizers and seeds as well as market information. The equipment was also used to facilitate the timely provision of credit. The result was that the rate of loan recoveries rose, non-performing assets (loans) were reduced and loans were provided on a timely basis.[37]

4. Other areas of poverty alleviation

(a) Use ICTs to improve access to information on government services and entitlements

Access to information on government

[35] PEOPLink is in the process of building a network of non-profit trading partners that use digital cameras and PCs to create and upload web catalogues displaying the works of thousands of artisans. PEOPLink conducts training (mostly online) and has developed an online toolkit to enable grass-roots artisan groups to produce and upload their own web catalogue from any country in the world. The PEOPLink web site provides links to the web sites of the trading partners for larger orders. Netaid website: <*http://netaid.org*>.

[36] The Virtual Souk was launched in 1997 and coordinates local groups' online sale of hand-made goods from North Africa and the Middle East via NGOs which perform quality control checks, select artisans and process orders.

[37] Randeep Sudan, *Use of Information Technology for Poverty Alleviation: Focus on Andhra Pradesh* (2000).

services is one of the barriers to development faced by rural and disadvantaged communities. Governments are equally challenged to ensure a meaningful presence and service to rural communities. In the MSSRF project, information on government services was accessed by 45 per cent of the user population, numbering around 150 per month on average, and villagers were able to benefit from government services of which they were previously unaware. These services included housing loans for fishermen, which have benefited nearly every fisherman in one village, and a national life insurance scheme, of which every household in another village is now a member. Over 100 such entitlements have been identified to date.

D. Action by international organizations

International organizations are already active in ICT-related programmes. Some activities of relevance to the Asia-Pacific region which are supported by international organizations are as follows:

1. Global programmes

UNDP Sustainable Development Networking Programme (SDNP) - assists in connectivity and access to sustainable development in over 40 developing countries <*www.sdnp.undp.org*>.

NETAID (UNDP initiative) utilizes the networking capabilities of the Internet to promote development and alleviate extreme poverty globally by linking people and resources to projects and programmes. Netaid has an online volunteering programme which matches people worldwide with projects for mutual benefit. For more information and online volunteering opportunities, visit <*www.netaid.org*>.

UNCTAD commodity risk management programme - to increase the transparency of price formation for commodities through IT-based online access to prices formed on commodity exchanges and helping producers to understand the price formation mechanism and the proportion of the price which is fair for them to receive as well as how to improve this price through quality control, enabling small producers to bargain with traders. Products of interest to Asia and the Pacific to which the system could be applied include cocoa, coffee, cotton, jute and sugar <*www.unctad.org/infocomm/anglais/indexen.htm*> for market information on commodities.

World Bank infoDev projects: The infoDev programme began in September 1995 with the objective of addressing the obstacles facing developing countries in an increasingly information-driven world economy. It is a global grant programme managed by the World Bank to promote innovative projects on the use of information and communications technologies for economic and social development with special emphasis on the needs of the poor in developing countries. Donors include Governments, international organizations and the private sector. Nine infoDev projects (in initiation stages, active or completed) are listed for South Asia, seven for East Asia and the Pacific and 14 for Central Asia on the infoDev web site <*www.infodev.org*>.

ITU – E-business infrastructure project - Electronic Commerce for Developing Countries (EC-DC). The project will implement secure e-business solutions and services in developing countries. Participating countries will benefit from security-related services for e-business transactions under affordable conditions. Using the World Trade Centre network's global infrastructure of 328 centres in more than 100 countries and WISeKey certification services, countries lacking secure trusted infrastructures, digital certification and electronic payment facilities will be able to use those of other project participants <*www.itu.int/ECDC*>.

ITU/United Nations system – ITU Valletta Action Plan Progamme 3 on "Integrated rural development and universal acces" <*http://www.itu.int/ITU-D-UniversalAccess/reports/PPstatus981016.htm*> is seeking to develop best-practice, sustainable and replicable models of ways to provide access to modern telecommunication facilities and information services through MCTs, particularly in rural and remote communities. Nine pilot projects proposed by national partners in response to a call for proposals are being implemented in Bhutan (in collaboration with UNESCO, FAO, WHO and bilateral agencies and national partners), India (12 MCTs, Gujarat, collaboration with UNESCO and others as well as national partners), Maldives, Viet Nam (4 MCTs, several international partners including Siemens and Ericsson, national partners, focusing on telemedicine), Benin, Honduras, Suriname, Uganda, Mali, Mozambique, the United Republic of Tanzania and Uganda. Projects in Africa are implemented within the framework of the United Nation system-wide special initiative on Africa <*www.itu.int/digitaldivide*>.

FAO – Virtual Extension, Research and Communication Network (VERCON) linking agricultural institutions to extension stations in the field through the Internet.

2. Regional programmes

IDRC Pan Asia Networking programme - Large programme focusing on infrastructure and content provision as fundamental programme components (Lao People's Democratic Republic and Cambodia, Viet Nam [national intranet], Philippines, Nepal [research institutions], India [MSSRF project]) <*www.panasia.org.sg*>.

IDRC – Electronic Networking for Rural Asia/Pacific Projects – Promotes access to the Internet by rural development projects financed by the International Fund for Agricultural Development (IFAD) in the poorest parts of Asia and the Pacific. IFAD is charged with alleviating poverty in rural communities. Selected projects will acquire connectivity and use while a larger number of projects will receive intensive assistance for developing national, regional and international networking at the project level <*www.enrap.org*>. Various other ICT-related programmes are also implemented and supported by IDRC <*www.idrc.org.sg*>.

British Council – TASKNET: Towards a South Asia Knowledge Network <*http://tasknet.nic.in*>

UNDP Asia-Pacific Development Information Programme – Based in Malaysia, assists 42 countries in using the Internet for their social and economic development and in alleviating poverty. Activities are: capacity-building through seminars and workshops on the use of IT and the Internet for development; bringing the Internet to rural schools with mobile Internet units; providing support to the Networking Academies Programme; creating information systems for distribution of regional information and providing low- or no-cost hosting services to development projects; and connecting countries or secondary rural centres to the Internet to facilitate participation in the global dialogue. The Networking Academies Programme is a joint initiative of Cisco Systems and APDIP in nine developing countries including India, Nepal, Papua New Guinea and Fiji designed to equip students with information technology skills that will enable them to design, establish and maintain networks <*www.apdip.net*>.

Asia-Pacific Networking Group – An Internet organization dedicated to the advancement of networking infrastructure in the region as well as to the research and development of all associated enabling technologies. Its mission is to promote the Internet and increase coordination of network interconnectivity in the Asia-Pacific region

<*www.apng.org*>.

UNFPA – several regional programmes - Asia-Pacific Population Information Network (Asia-Pacific POPIN); use of information technology to improve the quality of population information services and products; building knowledge bases and advocating change; and dissemination of population data and information in Asia and the Pacific <*www.unfpa.org/regions/adp/index.html*>.

3. National activities

Samples of projects/programmes at the national level in the Asia-Pacific region which in some cases fall under the above regional or global programmes are listed in annex 2.

E. Conclusions

In introducing ICT use to rural and disadvantaged communities, the private sector and NGOs play key roles in leading sustainable (as far as can be determined since most projects have been initiated in the last five years) and effective projects/programmes. These programmes should be viewed as an integral part of overall national information technology/poverty reduction/rural development programmes such as those developed by the Indian state of Andhra Pradesh. In applying ICTs for poverty alleviation, a wide range of actors (e.g., NGOs, investment banks, microcredit organizations, chambers of commerce) can be involved, depending on the application. Governments have also benefited by being able to use ICTs to provide services to rural communities.

International organizations are already involved in promoting ICT use for poverty alleviation by funding a wide spectrum of activities mainly focusing on Internet access and networking. A key point is that these projects are context-specific and will usually not be exactly replicable from country to country. Based on the recommendations provided, one potentially fruitful way of promoting ICT access in rural and disadvantaged communities which should be supported by Governments could be to bring NGOs, microcredit organizations, managers of rural development programmes and the private sector (telecommunications operators) together to look at the issue of rural telecommunications and to find and initiate viable solutions. This process could be supported by market surveys and case studies and guided by best practices identified, and should take place at the national level. Participating countries should be identified using pre-defined criteria relating to, interalia, the regulatory environment, accessibility and availability, interest of key actors and the presence of a working poverty alleviation project/programme. Collaboration should be sought from organizations that have substantial experience in this area, such as UNDP, ITU and IDRC.

In looking at possible ESCAP involvement in the application of ICT for poverty alleviation, microcredit organizations, producer organizations (arts and craft, primary commodities), trade promotion organizations and SME support organizations could be the focus of a series of regional workshops organized by each division and supported by other divisions as appropriate, focusing on the use of ICT for poverty alleviation. A range of organizations should be invited, in particular, those which already use ICT for the benefit of their clients. Collaboration with other regional or global projects, such as the FAO VERCON or the UNCTAD commodity risk management programme, should be sought as appropriate.

Annex 1.
Best practices

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
ASIA					
1.	BANGLADESH – Grameen Phone programme	GSM cellular phone	The programme facilitates the establishment of village payphone services, facilitated by small collateral-free loans to the rural poor with the objective of supporting small business activity.	• *Initiated* – Grameen Bank • *Funding* – Grameen Bank (microcredit) • *Technology* – Grameen Phone, in association with a Norwegian telecom operator	An evaluation of the programme in March 2000 indicated significant consumer surplus and quality of life benefits as well as facilitation of flow of remittances to the area from overseas family members. Significant income recorded for village phone operators. Gender of village phone operators was important in determining levels of usage. However, only 7 per cent of the users used the facility for business purposes. GSM cell phone technology is viewed as a high-cost solution for universal access in rural areas and does not facilitate e-mail/Internet/data connectivity. The evaluation suggested that targeting of unserved and underserved regions through market research as a basis for attracting investment capital.
2.	INDIA – Foundation of Occupational Development (FOOD)	64 kbps host connection to VSNL (ISP), with 14 subhosts	Food is a 20-year old NGO which has established 14 Internet subhosts with between 100 and 300 users (November 1999), mostly NGOs, of which 11 act as individual telecentres. FOOD provides computers and communications		Several benefits have been reported, including the establishment of a successful herbal-processing centre involving approximately 300 women, using connectivity support from FOOD.

Annex 1. *(continued)*
Best practices

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
			equipment, trains staff and provides day-to-day support, until they become self-supporting (requiring around 100 users). Network initiatives include the India Shop selling handicrafts.		
3.	INDIA – Loyola Joseph Telecentres		Network of 150 telecentres around Tamil Nadu, India, focused on providing telecommuting jobs in over 50 fields (writing, translating, computer technical, data entry, etc.). The centres are owned on a franchise basis with the network providing Internet connections and information services. Each telecentre is estimated to have provided around 50 jobs.[38]		

[38] *Source*: *<http://www.sn.apc.org/community/models.htm>*

Annex 1. *(continued)*
Best practices

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
4.	INDIA – M.S. Swaminathan Research Foundation (MSSRF)	Dial-up Internet access at the hub, offline, wireless web access at Village Information Shops.	MSSRF was established in 1988 as a non-profit trust for harnessing science and technology for environmentally sustainable and socially equitable development. In November 1998, four Village Information Shops and one Value Addition Centre (information hub) had been established in rural Pondicherry, India. The Value Addition Centre has dial-up accounts to two Internet service providers. The Village Information Shops have offline wireless access to e-mail and the World Wide Web via the hub.	Supported in part by IDRC (Pan Asia Networking programme)	During 1999, the majority of the usage (45 per cent) was related to government and entitlements with significant usage allocated to personal telephone calls, educational purposes and employment and training. The information produced (wave conditions, fishery information, government services for fishermen) has significantly improved the situation of fishermen. The information provided has facilitated small entrepreneurial activity (incense stick manufacture) and mobilized latent productive capacity among women. Employment opportunities and government services have also been accessed.

Annex 1. *(continued)*
Best practices

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
5.	CHINA – Implementation measures for poverty alleviation and wellbeing attainment through the introduction of information	Electronic networking via satellite	Network of county stations and Zhangjiakau City, China, established in 1995. County stations initially established in 13 counties. The network is used for the collection and dissemination of economic information and trade opportunities. Linkages with newspapers used in information dissemination.	• *Overall planning and programme coordination* – Government (leading group for economic development in poor areas under the State Council). • *Main implementation* – Ministries of the Electronic Industry and of Broadcasting, Film and Television, Economic Daily, Beijing Municipality, State Education Commission • *Funding (investment)* – China Agriculture Bank, City of Zhangjiakou	Results – agricultural product supplies matched to demand much more quickly. Expansion of trade and increased access to investment. Equipment was provided to 20 other counties after a few months. In April 1996, 60 counties were using the network actively. Profit realized in first year estimated at 2.5-3 million yuan renminbi.[39]

[39] *Poverty Alleviation through Technological Capacity Building*, Series II (ST/ESCAP/1682. ESCAP,1996), pp. 84-91.

Annex 1. *(continued)*
Best practices

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
OTHER REGIONS					
6.	PERU – Peruvian Franchises – telecentres established by the Peruvian Scientific Network (RCP)		Three different levels of service provided - • "Mother Infocentres" operated in major cities, providing training and marketing services and owned by RCP (non-profit organization) (25 established); • telecentres in smaller towns, franchised owners which are non-profit organizations or corporate bodies, with equipment, training and general support provided by RCP (by 1999, 250 had been established). The local owner runs the business and pays	• *Initiated* – RCP • *Funding* – private-sector franchise system	Described as successful. Starting in 1992 with US$ 3,000, income from regular operations amounted to US$ 6 million in 1999. An estimated 300,000 persons were users of the telecentres in 1999. The network facilitates e-commerce ventures such as "Tortasperu", in which housewives sell their cakes over the Internet for delivery in Lima. There is reported interest in the development of a similar service from El Salvador, Costa Rica and three African countries.

Annex 1. *(continued)*
Best practices

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
			around US$ 1,000 per month to RCP; and • "monocabinas" (in 1999 there were reportedly 250 in rural areas - one computer, printer, telephone and modem). The network as a whole develops information for the telecentres to use (health and education content and information on business opportunities)		
7.	SOUTH AFRICA – Vodacom Phone shops	Fixed line, cellular	Established by Vodacom, initially as an obligation under the National Cellular Telecommunications Licence to provide 22,000 lines in disadvantaged areas. This was planned through establishment of	• *Initiated* – Vodacom, • *Service provided* – under franchise arrangement to the public	As at the end of July 2000, 1,176 franchise operators provided telephony services in a total of 2,135 phone shop units to the rural areas in all nine provinces in South Africa. *Impact*: People in previously underserviced areas are making over 35 million calls (65 million minutes) from Vodacom's community phone shops and phone shop owners are receiving sizeable commissions from the network operator every month.[40]

[40] Vodacom web site: *<http://www.vodacom.co.za>*

Annex 1. *(continued)*
Best practices

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
			• Phone shops for franchised operators (highly-subsidized calls). Most franchisees take loans to cover the R25,000 cost of the franchise. • Mobile telephone services to educational institutions servicing rural areas.		Community phone recharge system Sigi Autocharge will allow community phone shop franchisees to buy bulk airtime from Vodacom/Siemens prepaid. Cellular phone technology has been upgraded to include fax and other data communications.

Annex 2.
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
ASIA AND THE PACIFIC					
	BHUTAN – Multi-purpose Community Telecentre (MCT) pilot project (Jakar)	Internet access through 64 kbps leased line	Jakar telecentre started operating in March 2000, with three computers, one fax machine, two printers and one photocopier. The computers are networked to share an Internet connection through one gateway(64kbs leased line).	• *Funding* – IDRC • *Management and services.* The management of the telecentre is entrusted to Bhutan telecom Jakar. The telecentre is managed by a telecom in charge with support from Area Headquarters and Telecom Headquarters. The MCT services are provided in two small rooms on the premises of Bhutan Telecom.[41]	
	INDIA – TARAhaat.com		The TARAhaat web site is designed to be a major portal designed for the needs of village users in the districts of Bundelkhand surrounding the city of Jhansi. The gateway connects the village user to information on markets, bus services, law, health, governance, government schemes and astrology, in English as well as in Hindi.		

[41] <*http://www2.itu.or.th/jakarmct/bhutan200.htm*>

Annex 2. *(continued)*
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
	INDIA - Satellite-based Training and Development Communication Channel (TDCC) in I	One-way video and two-way audio teleconferencing channel	Areas of focus: • *Rural development* – poverty alleviation programmes, local self-government, awareness building and social mobilization, strengthening of social safety nets, training of rural people in the areas of watershed management, health and environment • *Industrial training* – multi-location organizations such as banks and industrial establishments use the network • *Distance education* – currently covers some half dozen provincial governments	• *Technology provider* : Indian Space Research Organization (ISRO) • *Users* : Central ministries, provincial governments, NGOs	
	INDIA – Integrated Mission for Sustainable Development	Remote sensing and GIS	Use of remote sensing and GIS for the planning and decision-making process at the grass-roots level. Focusing on poverty alleviation through sustainable development of land and water resources, targeting		The pilot project was established in eight drought-prone districts in 1988-1990; its success led to a national operational mission.

Annex 2. *(continued)*
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
			sources of drinking water, identification of wastelands/low-productivity areas.		
	PHILIPPINES – Small Investor Programme		Establishment of a countryside market for Treasury securities of small denomination applying an electronic auction system which includes a settlement bank and bond exchange. The Small Investor Programme is an integrated part of this effort aimed at encouraging Philippine citizens in rural areas to hold and trade local government securities as a savings instrument.		
	CHINA – Distance Education through satellite	Satellite television	Since 1986, China has been using satellite TV for distance education. Supporting policy requests governments above county level to develop the necessary facilities. Training is provided by the China TV teachers' college at the primary and secondary school levels. At	• *Lead organization* – The Ministry of Education of China • *Participating domestic organizations* – Educational authorities at the provincial and county levels, Ministry of Science and Technology, Ministry of Agriculture, Ministry of	Since 1995, TDCC use (number of days) has more than doubled. Programme results: • Since 1986, more than 2 million primary and secondary school teachers and principals have been trained; • The qualification rate of

Annex 2. *(continued)*
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
			least 11 provincial satellite TV education channels are in operation, supporting basic education, agricultural knowledge dissemination and specific training needs. The programme is being upgraded to broadband Internet-based distance education, using 6,000-7,000 satellite stations in rural areas.	Information Industries and other related ministries • *International organization support* – UNESCO, UNICEF	primary school teachers has been raised from 62.3 per cent in 1986 to 93.1 per cent in 1997; • Over 2.3 million have graduated from the China Central Radio and TV University. Over 260,000 are currently registered.
OTHER REGIONS					
	SOUTH AFRICA - Universal Service Agency telecentre pilot project	Fixed line network of national carrier, Telkom South Africa.	Six projects established in South Africa. Each telecentre has six exchange line connections (four for voice, one for Internet, other for data (fax)), photocopier, scanner and overhead projector.	• *Initiated* – CSIR • *Technology provided/funded* – CSIR, World Bank, IDRC, Universal Service Agency (Government) • *Evaluation* – IDRC • *Sources of information* – Business sector and consultants, NGOs, CBOs, parastatals, local people, government, Telematics for African Development, National Information Technology Forum	Computers are not optimally used at most telecentres, except for training. Scanners and overhead projectors have never been used. Some problems experienced - system malfunctions; relatively high cost of Internet access; pricing policies; accounting/monitoring systems lacking; and inadequate training. Poor communication with the United States regarding the role

Annex 2. *(continued)*
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
				• *Other contributions* – Independent Development, Trust (IDT), Pretoria Development Trust (PDT), South African Breweries (SAB), Ithuba, Mike Horwell (of Nortel), IDRC.	of the telecentre operators. At least two of the telecentres closed after establishment (lack of electricity and theft).[42]
	SOUTH AFRICA – Community Based Information Service (CBIS) in Mamelodi, South Africa	Wireless Community Network (called Community Information Delivery System (CIDS)) – high-speed access to local nodes and to the Internet. In Pretoria, 2 mbps wireless networking. Seen as a cost-effective institutional connection.	Community service to provide information to members of the community about information resources found in and around the community, focusing on "survival" information (health, housing, education, etc.) for the improvement of quality of life.[43]		Challenges identified: • *Marketing* – lack of outreach activity • *Technology* – lack of technological expertise to do second line maintenance and support • *Funding* – most companies fund equipment or specific programmes and not running costs • *Sustainability* – questionable • *Competitors* – there are private entities providing some components of these services

[42] Fikile Khumalo, Acting Director, Universal Service Agency [USA], South Africa <fikile@icon.co.ya>, *Preliminary Evaluation of Telecentre Pilot Projects* (International telecommunication Union [ITU], 1998 <*http://www.ituoint/ITU-D-Universalaccess/evaluation/usa.jtm*>).

[43] Esme Modisane and Nebo Legoabe, *Mamelodi Community Information Services (MACIS) Case Study* (<*http://realserver.itu.ch/BICA99/sp5.html*>). Web site: <*http://mweb.co.za/mamelodi/main1.html*>. Contact: Ms Esme Modisane, Project manager Mamelodi Community Information Services, P.O. Box MAMELODI 0101, South Africa, Tel.: +27 12 805 1295, Fax:+2712 805 1293, E-mail: <*emodisan@callisto.cids.org.za*>.

Annex 2. *(continued)*
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
	SOUTH AFRICA – GCIS Multi-purpose Community Centres		At least three pilot centres have been established in disadvantaged communities, which function as one-stop shops for government services.		
	SOUTH AFRICA – Department of Communications Projects		Internet laboratories have been established at historically disadvantaged tertiary education institutions, public Internet terminals are being established in several post offices; community Post offices provide a range of ICT services *<http://www.sn.apc.org/community/projrev.htm>*.		
	AFRICA – UNDP Technology Access Centres (TACCS), Egypt	Internet	Three public facilities established as of May 2000, offering access to computers with modems and printers. Initial training given to 30,000 persons with a view to supporting development activities in the community. Centre staff developed web pages, mostly in Arabic, offering information/applications in health, agriculture and e-commerce, as well as	• *Project implementation* – UNDP IT for Development Programme • *Training* – United Nations Volunteer Programme • *Sharkeya Governorate* (Egypt federal Government) • *Other partners* – Investors Association of 10th of Ramadan City, Sharkeya Chamber of Commerce , IDSC	Substantial content in Arabic generated, 3,000 users trained.

Annex 2. *(continued)*
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
			information on culture and history and the promotion of local innovations and expertise. Service to be expanded throughout Egypt.[44] Other TACCs planned for other regions.		
	SOUTH AFRICA - Rural Community Telecentres, Zambia	Internet	Establishment of community telecentres, operating on a commercial basis, offering information and transaction services. Telecentres will operate on a franchise basis under a holding company (eLink Zambia Ltd.). Project started November 2000. Content will be developed with partner organizations under a parallel project (Rural Information Services Development project). Technology will be financed through a lease arrangement between the holding company and franchisees. The franchise will		

[44] UNDP Communications Office, *Newsfront* (<*http://www.undp.org/dpa/frontpagearchive/may00/11may00/index.html*>).

Annex 2. *(continued)*
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
			cover equipment lease, Internet access, training, promotion and content development. Local franchisees will work though local farmers' and other associations to attract users. Content will be targeted to agricultural producers, agri-business, local educational institutions and students, local health care providers and social organizations. Rates charged will be based on real market value.[45]		
	UKRAINE – Sustaining women-farmers in Ukraine	Networked computers with Internet access.	The project (started in June 1999) aims to improve the status of rural women and the lives of their families in the context of the transition to a market economy. Information centres were established at the branch offices of the Council of Women Farmers in various parts of Ukraine. Training seminars given to improve entrepreneurial, managerial and IT		

[45] Web site of the International Institute for Communication and Development (IICD): *<http://www.iicd.org>*. Contact: *<information@iicd.org>*.

Annex 2. *(continued)*
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
			skills and a training manual developed. Telecentres will provide access to computer training and to information for farm operation and management, and facilitate networking and exchange of information.[46]		
	GHANA – E-commerce for non-traditional exports		In support of recent growth in the production of non-traditional export products, in particular, agriculture-related products, the project provides market-related information and promotional opportunities to Ghanaian non-traditional producers and exporters. Started in May 2000. An information centre will be established, which will provide information at an affordable price (flat fee of US$ 15/ month) with the option for very low-income producers to subscribe in small producer groups.[47]	• *Project implementation* – Rural Agricultural Development Authority of the Ministry of Agriculture (RADA head office and extension staff) • *Fund raising and supply of expertise* – IICD	• *Implementing agencies* – Agricultural Sector Investment Programme (AgSSIP), IICD, Ghana Export Promotion Council • *Other partners* – Federation of Ghanaian Enterprises, Association of Ghanaian Industries • Towards the end of the project, a Special Business Development Unit (SBDU) established by the Ministry of Food and Agriculture (MOFA) will be responsible for the project activities.

[46] Web site of the Council of Women-Farmers of Ukraine: <*http://www.cwf.org.ua:8080/info_en.htm*>.
[47] Web site of the International Institute for Communication and Development (IICD): <*http://www.iicd.org*>. Contact: <*information@iicd.org*>.

Annex 2. *(continued)*
Other projects and programmes

	Name of project programme and area	Technology applied	Brief description	Lead and other agencies involved	Project impacts/evaluations/ comments
	JAMAICA – Agribusiness Information System	Local database application operating over a local-area network, client-server database application operating over a wide-area network (WAN), Internet Server-Client	Establishment of an information system that provides better access to useful, timely and accurate agricultural information to an estimated 50,000 small farmers to increase the efficiency of production and competitiveness of agricultural products. Project started in August 1999. Information will focus on domestic food crops. Initial services will include production information, registry services and technical guides, based on needs assessment. Farmers will be serviced through producer and trading associations.		

IV. TECHNOLOGICAL CONDITIONS AND ISSUES IN PROMOTING INTEGRATION OF INDUSTRIAL ACTIVITIES AT THE REGIONAL AND GLOBAL LEVELS: PROSPECTS AND CHALLENGES OF GLOBALIZATION AND LIBERALIZATION

Jürgen Bischoff [48]

A. Introduction

The emergence and rapid diffusion of new technologies (information and telecommunication technologies, nanotechnology, biotechnology and new materials) are reshaping economies and societies around the world. These new technologies are not only creating new products, but are also changing the characteristics and performance of many traditional products by becoming critical components in their manufacturing as well as functioning. Because of this pervasive feature, the new technologies, which are also considered generic technologies, have brought about tremendous changes in the industry, economics and competitiveness of firms and nations. With the accelerated rate of innovations, shortening of product life cycles and rapid decrease in production costs, the business environment is rapidly shifting competitiveness among firms and countries. These rapid technological changes, coupled with the globalization of trade and investment, have increased the importance of technological capabilities as a source of competitiveness for enterprises in particular and nations at large. Globalization of national economies is reshaping and deepening mutual cooperation through sharing of experiences and focusing on building economic partnerships, capabilities, competitiveness and efficiency. This has ushered in a new era of opportunities for countries, whether developed or underdeveloped, to search for complementarities and cooperative mechanisms to sustain dynamic development, generate economics of scale and achieve the shared objective of sustainable development with equal opportunities for the participating countries. In the "globalization of knowledge", technology is playing a key role which is inducing enterprises to build new forms of cooperation, partnerships and alliances and resulting in opportunities for enhanced technological capacity-building in these countries. As countries deepen their cooperation and extend it to multiple sectors, they are also enhancing their technological capacities to participate in global markets. Technological capability-building in new technologies helps in acquiring new factors of competitiveness as well as enhancing the strength of existing comparative advantages. Hence, it becomes imperative for countries, especially the developing and least developed countries, to build up capabilities in new technologies:

- To enhance cost-effectiveness
- To make efficient use of natural resources
- To integrate and compete in the international market

B. Review of the technological situation in selected countries of the Asia-Pacific region

1. Technology capacity-building for industrial competitiveness

The Organization for Economic Cooperation and Development defines technological capability as:

"The notion of technological capability attempts to capture the great variety of

[48] Director, Asian and Pacific Centre for Transfer of Technology, New Delhi.

knowledge and skills needed to acquire, assimilate, use, adapt, change and create technology. It goes well beyond engineering and technical know-how to include knowledge of organizational structures and procedures as much as knowledge of behavioural patterns, e.g. of workers and customers. Firms need certain complementary assets and capabilities in order to create, mobilize, and improve their technological capabilities, among which may be noted organizational flexibility, finance, quality of human resources, sophistication of the support services and of the information management and coordination of capabilities".

In other words, although investments in technological learning by individual firms fuel technological development, it is policies and institutions that shape the incentives to invest in technology and provide vital complementary resources, information skills and specialized technical services. In their efforts to develop technological capabilities, firms draw heavily upon such external technological resources through both market and non-market means. Furthermore, investments in various aspects of technological learning are highly interdependent or involve pervasive externalities. As a result, there are often significant areas in which certain forms of cooperation among firms and government agencies may result in more rapid technological development.

Technology capacity-building itself is a process of accumulative learning. Therefore, it takes time and concentrated efforts. It usually occurs in interlinked phases. Upstream basic research-innovation-product design, development or downstream-marketing-production-process engineering. In many developing countries (China, India and some economies in transition), it was not possible to convert the knowledge accumulated in upstream activities into products in the downstream activities for economic benefit. However, developing countries that followed export-oriented growth policies, adopted downstream activities which yielded immediate economic benefits. Having built up strong technology capabilities, often through original equipment manufacturing (OEM) alliances with transnational corporations in downstream activities, they were able to move towards technology capacity-building in upstream activities (Taiwan Province of China, Republic of Korea). Although OEM makes the SMEs in developing and least developed countries dependent on multinationals, it remains a significant source of technology for a variety of reasons.

Innovations in many cases are based on incremental improvements. The cumulative effect can be a powerful driver that enhances quality and productivity. Thus, enterprises in developing countries must concentrate more on improving their technological base and in-house capability for upgrading and adopting technology. Despite the heterogeneity of the Asia-Pacific countries, there are certain generalizations that can be made, particularly in terms of the problems they face in building technological capacity. These can be classified as follows:

- Lack of strong political will and commitment at the highest level
- Ineffective research and development (R&D) institutional structure with weak links to production sectors
- Limited scientific and technical human resources and skewed distribution of such resources
- Heavy reliance on imported technology
- Scarcity of support facilities and technical information and services
- Inadequate capabilities for technology assessment (TA), which makes it difficult to evaluate technologies for local development
- Inadequate and inappropriate international

technical assistance and ineffective utilization of such assistance
- Inadequate private sector production unit participation in technology development

Over the last few decades, and particularly following the globalization and liberalization process which began in the 1980s, a number of Asian countries have been undergoing restructuring and reforms of their technology support institutions (TSIs)[49] to make them more innovative in the process of technological development. A new learning process is under way to transform the attitudes of government-funded units to those of active innovation service units and also to strengthen cooperative relations with enterprises for effective commercialization of research results. An overview of the experiences of a few selected Asian countries and some specific programmes initiated by them to strengthen technology capacity is presented below.

The Chinese experience

In China, up to 1985, close R&D community-industry interactions were almost non-existent. The technologies generated by the research institutions were given to the designated enterprises free of charge. In most cases this led to a situation which allowed inefficient technologies to creep into enterprises, which in turn could not compete internationally. Since the initiation of the reforms of the science and technology (S&T) system in 1985, this situation has been reversed and effective linkages have been forged between the R&D community and enterprises to generate technologies to meet the specific needs of the competitive market. During the reform period, a number of mechanisms were evolved to effectively link academia with industry. There has been significant progress in linking research institutes with production and this has facilitated efficient technology transfer through various measures:

Contract research

In 1985 alone, 7,469 technology transfer contracts were signed by academic institutions with industrial or other recipients. Classified by category of recipients, large and medium-sized State-owned enterprises accounted for 47.9 per cent, small State-owned enterprises accounted for 29 per cent, collective enterprises 7.4 per cent, village and township enterprises 9.6 per cent and other entities 6.1 per cent. Statistics reveal that about 80,000 science and technology research projects are being conducted in China's more than 1,000 institutes of higher learning. An investigation of 17 colleges and universities in Beijing, Shanghai, Jiangsu and Hubei shows that during 1991-1992 more than 5,000 inventions by college students were put to use.

High/new technologies pioneer service centres (PSCs)

These PSCs (also known as incubators) have been established in hi-tech zones to transfer scientific research results to production centres. The first such centre was founded at Wuhan in Central China in 1987. Since then more than 70 incubators have been established in various provinces and cities. These centres provide scientific workers with a place to turn scientific results into technical applications. The concept of a business incubator is to reduce the investment cost of venture business and to enhance the success rate of technology-based start-ups.

[49] TSIs are defined as independent and external organizations, not directly related to the firm's business transactions, that help firms to improve their technological capability. They may be multifunctional or function-specific, short-term or long-term. TSIs may be local, regional or national public research institutes; universities or technical colleges; quasi-public industrial or academic associations; or private consulting firms or laboratories.

High-technology development zones (HTDZ)[50]*– the torch programme*

The torch programme had, as its major thrust, the establishment of a number of high technology development zones (HTDZs) for the development of new technology enterprises (NTEs). These HTDZs (similar to S&T parks in developed countries) are being promoted through the torch programme initiated by the State Science and Technology Commission (SSTC) in August 1988, with the objective of developing new and hi-tech products in close cooperation with universities and research institutes. Given the sluggish response by state-owned enterprises (SOEs) in accepting new technology (either through transfer of technology or by incorporating R&D institutes into existing enterprises), the technology parks were seen as a new and dynamic way to bring high technology from the research institutes into the marketplace. This was supported by preferential tax treatment in the zone (15 per cent instead of the national rate of 33 per cent), special loans to finance new enterprises (various schemes were developed by provincial governments to encourage banks to cooperate) and preferential treatment for designated high-technology industries such as biotechnology, high energy physics, lasers, microelectronics, materials, computers and information technology, mechatronics and ocean engineering.

By 1992, 52 such national-level zones had been established, housing about 12,900 high/new-technology enterprises. About 1,000 of them are affiliated with the educational sector. However, most NTEs are located in urban areas with concentrations of R&D institutes and universities with the aim of exploiting the potential of the available S&T expertise. Beijing and Shenyang have the highest concentration of NTEs (table 11).

At present, China has more than 120 HTDZs at different levels. These zones have been developed with different specialties. For example, the Shenyang Zone features integration of machinery

Table 11. Cities with zones for NTEs in China

Zone	NTEs (Number)	Turnover (Billions of yuan)	Employment (Number)
Beijing	4 000 (1995)	7 (1995) 25 (2000)	29 000 (1991)
Shanghai	28 (1991)	0.7 (1991)	18 700 (1991)
Shengyang	250 (1991) 600 (1991)	0.36 (1991)	5 800 (1991)
Anshan	>150 (1995)	0.7 (1995)	
Guangzhou	185 (1991)	1.44 (1991)	2 600 (1991)
Xi'an	200 (1995)	2.5 (1995)	

Source: *A Decade of Reform: Science and Technology Policy in China* (Ottawa International Development Research Centre, 1997).

[50] These HTDZs are essentially science and technology parks (STPs). An HTDZ is an industrial complex, close to places of learning like universities, colleges or polytechnics or research 3laboratories and having formal or informal links. It is designed to encourage formation of knowledge-based industries in a high-quality and competitive environment. It has a management function for transfer of technology and business skills to enterprises on site and aims to reduce the time gap between scientific invention and its commercial application. The first STP was established at Stanford University in the United States around 1950. However, the STP movement picked up only in late 1980's. At present, there are 200 parks in the United States, 52 in the United Kingdom, 86 in Germany, 27 technopoles in Japan, 120 high-tech zones in China and 12 S&T entrepreneurship parks in India. In the United Kingdom, the 52 parks have come together to form a Science Park Association.

and electronics, while the Nanning Zone focuses on the development of agro-biotechnology. The Daqing Zone established in 1992 places high priority on promotion of oil and petrochemical equipment as well as refined chemical technology.

Spark programme

The spark programme initiated in 1986 is aimed at promoting the application of appropriate technologies in village and township enterprises (VTEs). It is the first strategic programme in China to promote development of the rural economy through the application of science and technology. By introducing appropriate advanced technologies in the VTEs, it makes for in-depth development and full use of the resources of rural areas, gradually forming a backbone of industries to promote the development of other economic sectors, thus promoting the regional economic development of rural areas. From the point of view of technological innovation, the spark programme is a rural regional activity organized by the Government with participation from VTEs and farmers.

In China, as in many other developing countries of the region, indigenous technologies have been mainly adopted by SMEs in the country. Achievements in this regard at the international level are few. Some of the research institutes in China are so small that they should not be listed as R&D units per se. Further, funds are diffused among too many research institutions to have any major impact of any international significance. These factors have contributed to the low level of scientific production and technological capabilities in these countries.

The Indian experience

In India, specific programmes have been initiated under the Department of Science and Technology (DST) and the Department of Scientific and Industrial Research (DSIR). These include:

Box 9. Organization of the research and development activities of selected Chinese universities

A number of universities in China are shifting to manufacturing to finance their research and educational programmes. Beijing University has established a number of companies, e.g. the Bei Da New Technology Company, the Bei Da Fang Zheng Co., and the Bei Da Weimin Bioengineering Co.

The success of these enterprises set up by the universities is shown by the fact that some of them are listed among the country's 100 top high-tech enterprises. These are Beijing University's Founder Group, Xi'an Jiaotong University's Kaiyuan Group, Qinghua University's Ziguang Group and the Fudan University's Fuhua Group.

Several school-based R&D centres have been set up jointly by enterprises and academic institutions. For example, the Ministry of Petroleum and the General Petrochemical Corporation have set up seven such centres in close cooperation with nine academic institutions. Through these centres, cost-effective R&D activities are possible and a better integration of basic research, development, design and production is achieved. Some 67 R&D centres for engineering technology had been established by the State by 1993 to improve R&D for engineering technologies, strengthen the connection between academic institutions and enterprises and promote transfer of research results to enterprises.

Box 10. An Indian case of R&D commercialization

In the 1980s, a group of 10 scientists renewed efforts to develop an economically viable process for the production of Vitamin B6. The laboratory work was completed within two years and the process details and chemistry were passed on to the National Research Development Corporation (NRDC) in 1982 for commercialization. Lupin Laboratories approached NCL, took up the technology and set up a commercial plant in 1987.

Science and technology entrepreneurship parks (STEPs)

This scheme was initiated by the National Science and Technology Entrepreneurship Development Board (NSTEDB) under DST in 1984. The objectives of STEPs are: (a) to forge a close linkage between universities, academia and R&D institutions on the one hand and industry on the other; (b) to promote entrepreneurship among S&T persons; and (c) to provide R&D support to small-scale industry through interaction with research institutions.

Home-grown technologies(HGT)

The Technology Information, Forecasting and Assessment Council (TIFAC), an autonomous body under DST, has started a programme of home-grown technologies under which it monitors technologies available with laboratories and matches these with the interests of industries willing to venture into development, design and commercialization efforts. It covers a wide range of sectors like steel, sugar, biotechnology, agrofood processing, environment, chemicals and energy. Under the HGT programme, identification of the projects is based on industry requirements, user needs and expertise available (individual and institution). Only partial funding is given by TIFAC and even these funds are generally to be returned. Some of the funded projects are showing good results. The confidence level on commercialization is reported to have gone up. For one project on high-energy magnets, an industry is about to enter into large-scale production. HGT projects have collaboration among institutions and industry.

Programme aimed at technological self-reliance (PATSER)

Initiated by DSIR, the programme aims at promoting and supporting industry's efforts to develop indigenous technologies and absorb imported technologies. It provides partial financial support for research, development and design of engineering projects undertaken jointly by industry and R&D organizations and academic institutions. During 1992-1998 about 65 projects were supported under this programme. These projects covered products and processes in various industries such as metallurgy, electrical, electronics, instrumentation and mechanical engineering.

The experience of the Republic of Korea

In the 1980s, the Ministry of Science and Technology (MOST) of the Republic of Korea, recognizing the effectiveness of cooperative R&D for the rapid utilization of research results in government-sponsored research institutes (GRIs), devised schemes and incentives to promote cooperative programmes between GRIs and private enterprises. Cooperative R&D between private firms and GRIs is classified as vertical cooperative R&D as there is an implicitly assumed division of labour in two sectors of the society. Consequently, new technologies were acquired by private firms in collaboration with GRIs. The major concern of the participant firms in vertical cooperative R&D with GRIs was acquiring technological capability,

Box 11. Commercialization of R&D results in the Republic of Korea

In the 1980s, the Ministry of Science & Technology in the Republic of Korea launched the Centre for Research and Development Commercialization (CRDC) to promote the transfer and commercialization of new technologies from universities and GRIs to private industry. One critical function of CRDC was to provide long-term loans to support the commercialization process in private firms as well as for the consolidation of marketing activities in the field of technology-based venture business. The Government has provided 80-90 per cent of the total R&D investment to R&D institutes involved in national R&D projects for core and fundamental technology development, industrial technology, alternative energy technology development and other programmes formulated by the Government. It also provides financial support of up to 50 per cent of the total cost to individuals or small firms for commercializing new technologies. Since the 1970s, the research programmes financed by both Government and industry, have focused on developing strategic, high-risk, high-cost technologies that could not be developed by industry alone. The development of the 4M DRAM, the localization of fuel supply for nuclear reactors and the development of artificial diamonds are some of the examples.

whereas horizontal cooperative R&D sought access to certain markets with combined efforts. MOST has put in place a joint research system through which industries can participate in the projects formulated by themselves with GRIs. The Government has also extended R&D subsidies and conducted research jointly with private firms, the results of which are commercialized by the participating enterprises.

Some of the corporations established for venture business are:

- Korean Technology Advancement Corporation (K-TAC), 1976;
- Korea Technology Development Corporation (KTDC), 1981;
- Korea Development Investment Corporation (KDIC), 1982;
- Korea Technology Financing Corporation (KFTC), 1984;
- Korea Technology Banking Corporation (KTB), 1992.

In order to facilitate the exchange of technological information and expertise and meet the needs of industry, the Industry-Academy-Research Institute Cooperation Research Centre (IARCRC) was established under the organization of the Science and Technology Policy Institute (STEPI) of the Korean Institute for Science and Technology (KIST). The main functions of the Centre included transfer of intellectual property from GRIs to industries, free technological consultation (compensation given by the Government) and provision of specialized information in various technological fields. In October 1994, the Technology Development Consulting Centre (TDCC) was established under IARCRC to meet industrial needs in various technological areas like assessing research results available with GRIs for upgrading or scaling to a desirable economic size.

The Japanese experience

Japan is an excellent example of how the promotion of strong cooperative linkages between TSIs and industrial enterprises contributed to technological capability. Government policies have influenced the development of TSI/firm relations and the industrial structure has encouraged cooperative learning.

Japanese efforts to promote collaborative research are mainly through funding of specific programmes and establishment of institutes in specific disciplines that work in close cooperation with universities and industry. The Government

funds large, risky projects such as development of high-performance computers and power generators through research associations. The Bio-oriented Technology Research Advancement Institute was set up to promote basic R&D in biotechnology. In the 1980s, the Ministry of International Trade and Industry (MITI) established the Research and Development Programme on Basic Technologies for Future Industries, administered by the Japan Key Technology Centre, which partially financed government/business/academic cooperation. There are 16 national technical institutions, administered by the Agency of Industrial Science and Technology (AIST) under MITI. They engage in R&D, promote joint R&D with universities and private firms and often organize technology research associations. MITI has also identified about fifty locations for the development of technoparks for future industries. The New Energy and Industrial Technology Development Organization (NEDO), a public organization pursuing basic and advanced R&D in industrial technology, has built up large-scale facilities with the private sector and conducts international joint research.

The most elaborate form often established by TSIs with governmental subsidies for advanced technology are research associations, the most representative example of collaborative R&D in Japan. There are three types of research associations:

1. Participating firms divide research issues and conduct R&D in their own laboratories. Periodically researchers present their findings at meetings.
2. Firms conduct basic research in a joint laboratory and application research in their own laboratories. The Very Large System Integration Research Association (VLSIRA), from 1976 to 1980, borrowed 100 researchers from five competing firms and the Electrotechnical Laboratory. The average life of research associations is five to eight years, although they may continue with a small staff to administer patents and royalties and to repay government subsidies. The use of borrowed staff is important because these staff return to firms and transfer technology, and thus help to reduce costs. The method is a convenient way for the Government to promote R&D, disseminate information and encourage firms to cooperate.
3. A joint corporation that conducts all research. All members invest, and the corporation continues until it consumes the investment. For example, the Japan Key Technology Centre, a quasi-governmental corporation founded in 1985, promotes joint corporations in basic research. Another example is the Protein Engineering Research Institute (PERI) established by 12 Japanese and 2 foreign firms and Osaka University to conduct research on the structure and function of proteins and their industrial applications.

Interaction among firms and between firms and TSIs in Japan has stimulated technological innovation. Auto parts is the most successful "Keiretsu"-based industry. The textile and software industries also use "Keiretsu" relations. Auto assemblers and "Keiretsu" suppliers divide responsibilities for innovation and cooperate through design-in-quality, design-in-manufacture and just-in-time production.

Keiretsu cooperation is divided into three levels:

- Core *Keiretsu* firms generate new technology, spend the highest on R&D and tend to have good internal R&D. These firms also aggressively use diverse and highly specialized TSIs. They particularly value consulting firms and universities, and also use research associations, local/regional technical institutes and national technical institutes.

Box 12. Strategic development of Japan's casting sector: an Example of State intervention

Japan's high-quality, highly-productive casting sector has been the key to its powerful competitiveness in a range of machine-based industries. Only forty years ago, the casting sector in Japan was technologically far behind the leading industrialized countries. By encouraging cooperation within industry and establishing TSIs to address a variety of needs, Japan was able to acquire technological capability rapidly and cost-effectively. The TSIs included national research institutes, prefectural research institutes (PRIs), industry associations, inter-company networks, industrial cooperatives, consulting firms and universities. The industry is composed mainly of small and medium-size subcontractors with less than 300 employees. Collaboration occurs in many ways, such as "Keiretsu" and subcontracting. Inter-company links complement formal TSIs. Government policies and incentives have both encouraged and relied on private-sector cooperation. A study carried out on the survey of the TSIs showed that PRIs have been important in the technological development of the casting sector in Japan. The Mie Prefectural Research Institute, serving a prominent casting area, offers R&D, laboratory services, technical consulting and training. With the increased emphasis on innovative and basic technologies, the Mie PRI focused on R&D, especially in advanced fields. When labour shortages posed a serious threat to the casting industry, the Mie PRI placed emphasis on training services that were highly valued by client companies and provided primary, secondary and advanced courses for engineers. Since casting is still important to the Mie economy, the local government provides full financial support for the PRI. Mie's systematic surveys of the prefecture's casting firms enable it to grasp their needs and to offer them carefully conceived services.

- Supporting *Keiretsu* firms concentrate on production and improvements of products and processes. They have some internal R&D but they mainly rely on local/regional institutes that offer diverse services. They also cooperate in worker training.
- *Keiretsu* subcontractors, which operate at the periphery of the production linkage, are without much product development capability. They use local and regional-level research institutes for technical innovations.

Thus, the formation of a major mission-oriented programme centre around specific institutions like national technical institutes, research associations and joint corporations and Keiretsu relationships has been the basic strategy in Japan to generate technological innovations. The development of TSIs and the variety of interaction between firms and TSIs and among TSIs is the hallmark of Japan's development.

Experiences of other countries of the Asia-Pacific Region

In Australia, cooperative research centres (CRCs) are being established in the form of companies to forge effective linkages between universities, public-sector R&D institutions and industry. One of the main objectives of these CRCs is to capture the benefits of research and strengthen the links between research and production. Currently there are 61 CRCs across the country in six designated industrial sectors including manufacturing technology, information and communication, mining and energy, agriculture and rural-based manufacturing, environment and medical science and technology. The obvious feature of CRCs is that they involve collaboration between research groups and the users of research. This takes place in a formal arrangement designed by a joint-venture agreement between all the parties. The involvement of a university is mandatory in order to provide the formal

framework for the educational programmes of the CRC. These CRCs based on a corporate culture are reported to be very successful. A CRC association has also been formed to act as the interface between the CRCs and the Government. The Government provides seed funding to the CRCs for an initial period of two years through its Department of Industry, Science and Technology.

In most of the other Asian countries like Bangladesh, Nepal, Pakistan and Sri Lanka, coordination and linkages among R&D organizations and user agencies are extremely weak. Efforts made in this direction are still highly inadequate to be of any significant impact. Large private- and public-sector industries prefer imported technologies, while small companies do not have the finances to risk on technologies or products emanating from indigenous R&D. Some of the constraints experienced are a thin spread of limited available resources resulting in suboptimal efforts; isolation of the system from economic and development planning; poor quality of science education in schools and universities; and industry's preference for foreign sources of technology and expertise.

However, some efforts are being made to strengthen linkages between the R&D community and enterprises. For example, in 1987, the Scientific and Technological Development Corporation of Pakistan (STEDEC), a private limited company, was established to bridge the gap between national R&D organizations and the end users of research results. It acts as the prime agency for the commercialization of projects and technologies emanating from R&D organizations under the Ministry of Science and Technology and various other ministries.

In Sri Lanka, research in industrial activities is carried out by various institutions under the Ministry of Science and Technology, namely, the Ceylon Institute of Scientific and Industrial Research (CISIR), National Engineering and Development Centre (NEDC), Geological Survey Department, Atomic Energy Authority, etc. CISIR is the largest industrial research organization in the country and was set up in 1955 to provide, inter alia, science and technology expertise and services for the development of industrial processes/testing services, utilization of natural resources, training of research workers, etc. CISIR – through contract research, consultancy, etc. provides extension services in several industrial sectors such as agrochemicals, agro-based consumer products, building materials, food, industrial chemicals and products, industrial plant and machinery, industrial waste management, paper and pulp and plastic. The Institute's mission is to promote technological and industrial growth through demand driven R&D and internationally competitive technical services, leading Sri Lanka to NIC status. In a bid to rationalize its resources towards greater efficiency, the Institute reorganized its 13 research sections into 5 divisions and 2 units in 1993. All divisions and units have an industry-oriented outlook and carry out industry support activities.

In order to promote the use of indigenous R&D expertise, financial assistance schemes for obtaining technological assistance from local R&D institutions is being provided through national banks and financial cooperations. The projects funded by United States Agency for International Development (USAID) schemes like SMED (Small and Medium Entrepreneur Development) and AGENT (Agro Enterprise Development) also offer financial assistance to the industrial sector for acquisition of technical know-how, training and market development from local research organizations. A Technology Transfer Fund provides financial assistance on a grant basis to SMIs to help to upgrade technology and solve technology-related problems, training and acquisition of know-how.

The National Engineering Research and Development Centre (NERD), established in 1974,

also promotes indigenous technology through the coordination of technological, engineering and research capabilities of various public- and private-sector industries and provides advice and assistance in the adoption and assimilation of technologies consistent with the country's resource endowment.

In 1993, Indonesia also took some initiatives in this direction. Conscious efforts to promote cooperation between industrial enterprises and the R&D community were taken up. The building of linkages between industrial and R&D systems is an integrated programme covering not only the demand and supply sides but also technology support facilities and the national technology climate. Effective linkages between enterprises and R&D organizations and several specialized support facilities such as financial and venture-capital institutions, engineering (design, workshops, construction), meteorology, measurement and testing, and S&T information are now being promoted.

In Malaysia, the National Council for Scientific Research and Development is responsible for promoting the use of science and technology and for establishing a sound technological base for industrialization. However, a major concern in Malaysia is that the public-sector R&D needs to become more commercially relevant and contribute towards the economic development of the country. In this regard, public-sector research institutes are being encouraged to undertake applied research to solve product and process-related problems of industry. They also continue to undertake government-funded strategic industrial and non-industrial research.

A number of industrial technology research institutes (ITRIs) in developing countries have been able to carry out the transition from an "R&D laboratory" to an effective ITRI. An ITRI success story is well exemplified in Taiwan Province of China.

Box 13. Integrated circuit technology development strategy in Taiwan Province of China

The development of integrated circuit (IC) technology in Taiwan Province of China, was undertaken primarily by an industrial technology research institute (ITRI). In 1974, the ITRI established the Electronics Industry Research Centre (in 1979, it was reorganized as the Electronics Research Services Organization) to execute a government-funded R&D project responsible for developing IC technology. In the 1970s, American IC manufacturing technology was already a mature industrial technology. The ITRI adopted a technology introduction strategy in order to elevate the starting point from which it would begin its own IC development work, and in 1976 selected RCA (an American company) for the introduction of 7.0 µm metal-gate CMOS process technology. Because of the risk of converting items in the IC design and manufacturing industry, the ITRI adopted a pilot plant strategy to project the conditions of the commercial process. With assistance, the ITRI completed work on an IC pilot plant, which included process, design and testing capabilities. The ITRI then continued to develop its technological capability on its own. The technology development project took place from 1979 to 1983.

Over the course of the four-year project, the ITRI's process technology advanced from 7.0 µm to 3.5 µm. The set-up of mask manufacturing equipment was completed in 1981, after which the ITRI began to supply mask fabrication services to domestic IC firms and to its own pilot plant. In the area of IC design technology, the ITRI developed its own logical simulation programmes and mask design automation programmes.

Box 13. Integrated circuit technology development strategy in Taiwan Province of China *(coninued)*

A second technology development project took place from 1983 to 1988; very large-scale integration (VLSI) technology was becoming the predominant technology among IC industry leaders. Over the course of this second project, ITRI's process technology advanced from 3.5 μm to 1.0 μm, mask technology progressed from the original optical manufacturing technology to electron-beam manufacturing technology and the IC pilot plant was upgraded from a large-scale integration (LSI) plant to a VLSI model plant.

For commercialization, the ITRI selected various transfer mechanisms for transferring IC technology to industries for use in product designs or production processes. The IC industry was regarded as a high-risk field, and the private sector lacked incentive to enter this sort of uncharted territory. The ITRI thus decided to build one or more pilot plants to ensure commercial application of the technology it had developed. In 1980, the ITRI spun off an entire IC manufacturer: the United Microelectronics Corporation (UMC). UMC began production in 1982. In 1987, the Taiwan Semiconductor Manufacturing Company (TSMC) was established to provide IC design firms with foundry services. IC industry revenues grew from 63 million new Taiwan dollars in 1978 to 9.07 billion NTD in 1990. Once the industrial sector was actively engaged in IC design and manufacturing, the ITRI adopted technology dissemination as its strategy for transferring technology over to commercial application. Methods used by the ITRI included licensing, transfer of computer-aided design software, establishing a common design centre to promote IC design technology and providing technological services. When the newly developed applications did not match the exact needs of certain enterprises, or enterprises were not capable of using the new applications, then transfer of the new technology was accomplished through joint projects. Such joint projects were planned according to the demands of production technology and the R&D capabilities of industry. The ITRI would then develop particular applications to meet the needs of private firms. These included ICs for electronic wrist watches, melody generators, telephones and microcomputers.

2. International cooperation

In addition to the pursuit of domestic policy mechanisms, there has been a trend towards concerted international cooperation for technology innovation and building of information and communication technologies. Such cooperation has been induced either by purely private concerns, exemplified in enterprise R&D collaboration ventures, or as cooperation spurred by international programmes specifically designed to facilitate international technology cooperation, in an attempt to speed up technology-driven growth and development.

One of the factors that led to domestic as well as international technology cooperation was the mounting costs in terms of both human and financial resources required for science and technology. In the existing scenario of intense market competition, most multinational companies are investing in R&D even more than national Governments in developing countries. For example, IBM's investment in R&D is three to four times higher than the total Indian R&D expenditure. In some very costly fields, particularly those with major equipment requirements, cooperation is no longer a matter of choice but of absolute necessity. The continued growth of development costs is compounded by the shortening of product cycles, which implies rising financial risks associated with innovation and with the utilization of R&D results.

International cooperation in science and technology is, in principle and by definition, based

on mutual understanding and complementarity. The importance of complementarity is well illustrated in the case of technology cooperation between the Republic of Korea and the Russian Federation.

The Science and Technology Policy Institute (STEPI) established the Korea-Russia Science and Technology Cooperation Centre (KRSTCC) in 1991 for the purpose of facilitating technology transfer, human resources exchange and joint research and development activities. The major tasks of KRSTCC are to identify Russian technologies that can be easily commercialized and domestic technology needs. KRSTCC has shown how, based on complementary technologies, international cooperation in technology could be successfully implemented.

In order to utilize the full potential of technological cooperation, the developing countries would have to study more thoroughly the sectoral specialization of investing enterprises. This would call for more cooperation and exchange of information between investing and recipient countries, requiring regionwide coordination of industrial restructuring measures. In this regard, rationalization of entry and exit policies regarding mobility of factors across industries and over national boundaries could make a significant contribution in promoting industrial restructuring. The ASEAN experience in this respect shows what could be pursued in other parts of the region. To foster greater industrial cooperation, ASEAN began with three programmes:

(a) ASEAN industrial projects (essentially large-scale government-owned projects);

(b) ASEAN Industrial Complementation Programme, aimed at promoting vertical integration of production activities to be undertaken by several member countries with brand-to-brand complementation receiving 50 per cent tariff preference on investments in automobile parts;

(c) ASEAN Industrial Joint Venture Programme, which gave a 90 per cent margin of preference for trade with participating countries and allowed up to 60 per cent foreign participation.

The South Asian Association for Regional Cooperation (SAARC), although launched in 1985, has not met with much success in regional initiatives. Little progress has been made in

Box 14. Cooperation between the Republic of Korea and the Russian Federation

Since the Republic of Korea restored diplomatic relations with the Russian Federation in 1990, international cooperation in technology between these two countries has accelerated rapidly. The Republic of Korea needed to diversify its sources of advanced technology, while the Russian Federation faced a shortage of research funds and needed production technology to enable it to commercialize the outputs of its research. The Republic of Korea and the Russian Federation have shared the common understanding that both countries can benefit from linking the Republic of Korea's strength in industrial technology with the Russian Federation's advanced capability in basic science and sophisticated technology. In short, combining the complementary assets of the two countries has been the main content of the bilateral cooperation in science and technology. For example, joint research with the Russian Federation has proceeded in the form of the establishment of joint research centres in the Russian Federation and exchanges of human resources. As shown in table 13, up to now, five joint research and development centres have been established in major science and technology towns in the Russian Federation. The field of joint research lies mainly where the Russian Federation has strength and superiority.

economic issues. A South Asian Preferential Trading Agreement (SAPTA) was signed in 1993 and was to be implemented by the end of 1995. SAPTA is limited to the provision of preferential tariffs on an agreed range of goods. There is potential for utilizing the area's rich natural and human resources jointly through technical cooperation within the member countries but conditions are still not very conducive to the use of complementarities on a large scale.

The subregional economic cooperation grouping involving countries around the Bay of Bengal, BIMST-EC (Bangladesh-India-Myanmar-Sri Lanka-Thailand Economic Cooperation), which brings together countries of SAARC and ASEAN, has identified eight priority sectors for cooperation: trade, investment and industry, technology, infrastructure and transportation, tourism, energy, agriculture and human resources development. This will provide a range of opportunities for the countries of the subregional grouping to utilize complementarities for mutual benefit.

As competition intensifies, many countries of the region are looking for ways to move away from resource-based manufacturing production processes. As new generations of production processes begin to replace natural resources and labour-intensive processes, demand for multiskilled managers and a multiskilled workforce to run competitive industrial enterprises is sharply increasing.

C. Rapid technological innovations and discrepancies in technological levels: problems of competitiveness in the industrial sector among countries

1. Basic considerations

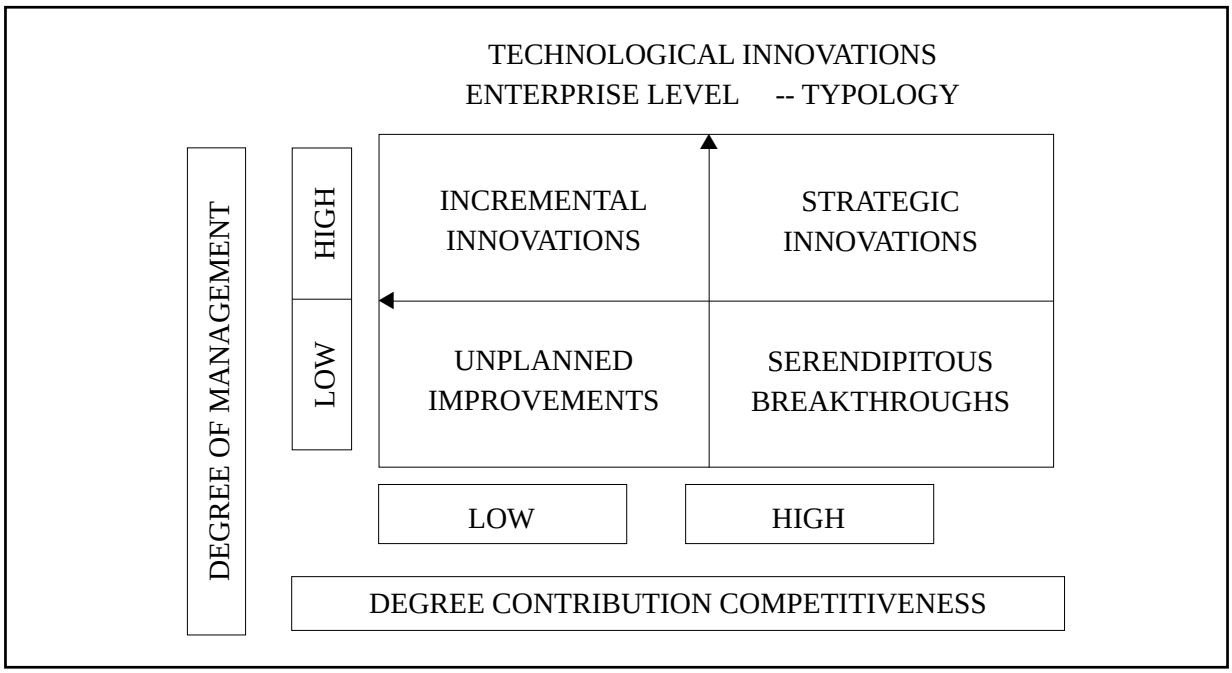
With the demise of protected markets, technological imitation by enterprises – which can rarely provide international differentiation on costs, products and services – is an increasingly limited option. Accordingly, the term technology, implying a static and shelf-ready solution, has to be replaced by technological innovation, meaning the frequently repeated act of applying technical changes new to the enterprise for increased profitability, growth, sustainability and competitiveness. Nations are therefore going to emphasize technological innovation as a means of fostering economic growth and societal welfare. It is the innovation activity which turns technological opportunities created in research and development into commercial reality. An innovation is usually defined as a new product or service that is successful in the marketplace. Incremental innovations, i.e. variations of existing products or slight improvements to dominant designs, do not require many changes in the way the company or the market works.

Figure 11 depicts a typology of technological innovations based on: (a) the degree of technology management capability required to carry them out successfully; and (b) their impact on the enterprise's sustainable competitiveness.

Unplanned improvements arise from a range of sources – ideas in the slower creativity of the workforce, client complaints and participation in ad hoc associations with other organizations. They require limited spasmodic capability in technology management and normally produce a suboptimized unsustainable impact on the enterprise's competitiveness and a low return on the use of partnership assets and do not incorporate durable environmental solutions.

Serendipitous breakthroughs correspond to unplanned innovations that produce a representative short-term impact on the enterprises and goals described above. They normally result from an accidental mix of technologies and other fortuitous conditions.

Figure 11. A typology of technological innovations



In contrast, the effective management of the two remaining types of innovation draws heavily on a solid technology management capability.

Incremental innovations are so widely adopted that they have been mistaken as the recipe for enterprise competitiveness by many entrepreneurs of SMEs. Therefore, what most organizations call innovation is actually confined entirely to incremental innovation. Without demeaning their relative importance for short-term gains in productivity, quality and profitability, and providing for both rapid credibility for change processes and building change management capability, incremental innovations by themselves do not contribute significantly to an enterprise's sustainable competitiveness, ecological responsibility and return on the use of the assets of the partnerships.

Strategic innovations result from ongoing processes in which a company synthesizes industry and technology foresight with the market place. As a result, it can strategically position itself to produce new breakthrough technologies, products and businesses. Companies that harness the power of strategic innovation generate dramatic profits, grow at rates that outpace the competition and are the first to recognize and act upon new emerging industries created by the new industrial revolution. Companies that are able to innovate strategically understand their role in shaping the future. A look at both the evolution of industries and technologies and at the requirements of the new industrial revolution provides insights into likely possible future scenarios.

2. Innovation and competitiveness in selected countries

Countries like China, India, Indonesia, Malaysia, the Philippines and Thailand have already been able to establish a broad-based manufacturing base. The majority of them remain attractive destinations for foreign direct investment (FDI) and other forms of external resource flows and have acquired a strong foothold in export markets, but they could easily be embroiled in fierce competition for the same export markets with declining prices for their goods. This could adversely affect their ability to generate the needed

income and investment to graduate to higher levels of industrial production with higher technological capability. To avoid this happening, these economies will have to find resources for industrial restructuring through innovation and move up the production ladder, creating space for other developing countries to enter into high value-added production lines.

Usually innovation is considered to result from previous investments in inputs that are required in the production of innovative outputs. Countries that make the greatest investments in R&D can be expected to produce the largest numbers of innovations. Similarly, industries that spend heavily on R&D tend to be more innovative and are therefore more competitive.

The sustainability of the advantage is therefore related to the dynamics of competition and to the nature of the underlying innovation. Approaches to and methodologies of the strategy process formulation should therefore consider that competition is increasingly dynamic and that innovation and competitive advantage creation are intrinsically interrelated.

Tables 12 to 18 give an overview of the innovative and competitive environment of countries of the Asia-Pacific region. The *growth competitiveness index* aims to measure the factors that contribute to the future growth of an economy, measured as the rate of change of GDP per person. These factors help to explain why some countries are improving their prosperity faster than others.

The *competitiveness index* aims to identify the factors that underpin high current productivity and hence current economic performance, measured by the level of GDP per person. These factors explain why some countries can sustain a higher level of prosperity than others. These two indices together provide a more revealing picture than either one alone.

The *startup index* indicates the ease of starting new enterprises. Old enterprises often have a greater economic incentive to defend the status quo simply because they themselves are sellers of existing products embodying existing techniques. This can be summarized in the idea that the economic value of the human and physical capital of older firms will drop somewhat if new products

Table 12. Growth competitiveness ranking

	Growth competitiveness ranking 2000	Competitiveness ranking 1999
Singapore	2	1
Hong Kong, China	8	3
Taiwan Province of China	11	4
Australia	12	12
Japan	21	14
Malaysia	25	16
Republic of Korea	29	22
Thailand	31	30
Philippines	37	33
China	41	32
Indonesia	44	37
India	49	52
Viet Nam	53	48

Source: *The Global Competitiveness Report 2000*, World Economic Forum.

Table 13. Current competitiveness ranking

	Current competitiveness index ranking 2000	Current competitiveness index ranking 1999
Singapore	9	12
Australia	10	13
Japan	14	14
Hong Kong, China	16	21
New Zealand	19	16
Taiwan Province of China	21	19
Republic of Korea	27	28
Malaysia	30	27
India	37	42
Thailand	40	39
China	44	49
Philippines	46	44
Indonesia	47	53
Viet Nam	53	50

Source: *The Global Competitiveness Report 2000*, World Economic Forum.

Table 14. Technology transfer index

	Technology transfer index
Singapore	1.95
Malaysia	1.08
Australia	0.91
Taiwan Province of China	0.90
Republic of Korea	0.82
New Zealand	0.73
Hong Kong, China	0.58
Philippines	0.54
India	0.32
Thailand	- 0.05
Japan	- 0.22
China	- 0.35
Viet Nam	- 0.51
Indonesia	- 0.66

Source: *The Global Competitiveness Report 2000*, World Economic Forum.

Table 15. Technology index

	Technology index	Innovation index	Technology transfer index
Singapore	1.95	0.98	1.95
Japan	1.59	1.59	-0.22
Malaysia	1.08	-0.33	1.08
Australia	0.91	0.78	0.91
Taiwan Province of China	0.90	0.81	0.90
Republic of Korea	0.82	0.33	0.82
New Zealand	0.73	0.45	0.73
Hong Kong, China	0.58	-0.04	0.58
Philippines	0.54	-0.92	0.54
India	0.32	-0.62	0.32
Thailand	-0.07	-0.94	-0.07
China	-0.35	-0.49	-0.35
Viet Nam	-0.51	-0.72	-0.51
Indonesia	-0.66	-1.18	-0.66

Source: *The Global Competitiveness Report 2000*, World Economic Forum.

Table 16. Startup index

	Startup index
Hong Kong, China	1.63
Singapore	1.31
Australia	1.04
Taiwan Province of China	1.04
New Zealand	0.56
Republic of Korea	0.19
Malaysia	0.11
Indonesia	0.02
Thailand	-0.15
Japan	-0.21
Philippines	-0.48
Viet Nam	-0.68
China	-0.78

Source: *The Global Competitiveness Report 2000*, World Economic Forum.

replace old products. New goods and services create value for enterprises so all enterprises have an incentive to innovate and to accept outside innovations. The difference is that old enterprises have a downside in addition to the upside of innovation, while new firms only have an upside. The ability of an economy to activate startups is likely to be an important complement to innovation and is an important way to facilitate technology transfer across countries and diffusion of the new techniques across different sectors within countries.

Effective innovation requires not just technological prowess but also complements to innovation such as the availability of credit and activation of new economic structures. The justification for the use of various measures of innovation and technology transfer comes from the fact that they are designed to be comprehensive and from the fact that they are correlated with observable by-products of innovation and technology transfer such as patents and high-tech export activity.

The *economic creativity index* is an attempt to bring together under one measure several important aspects of innovation, technology transfer and diffusion with the institutions that facilitate innovation and diffusion. The *technology transfer index* measures which countries are most active in international technology transfer. Since countries can get technology either by inventing it themselves or by importing it, an overall technology index is measured by whichever of these components is largest after they have been scaled to have similar units. From an economic point of view, what is important is that a country participates in the newest technologies and innovation, not whether it innovates itself. To raise GDP through technology-related activities, a country needs to achieve value-added at some stage of the process, not necessarily the inventive stage.

3. Emerging trends

A strong nexus has developed between FDI, manufacturing production, international trade and technological innovations. This nexus is beginning to shape the region's industrial scene and is extending beyond the traditional triangle linking the United States, Japan and the European Union

Table 17. Innovation index

	Innovation index
Japan	1.59
Singapore	0.98
Taiwan Province of China	0.81
Australia	0.78
New Zealand	0.45
Republic of Korea	0.33
Hong Kong, China	-0.04
Malaysia	-0.33
China	-0.49
India	-0.62
Viet Nam	-0.72
Philippines	-0.92
Thailand	-0.94
Indonesia	-1.18

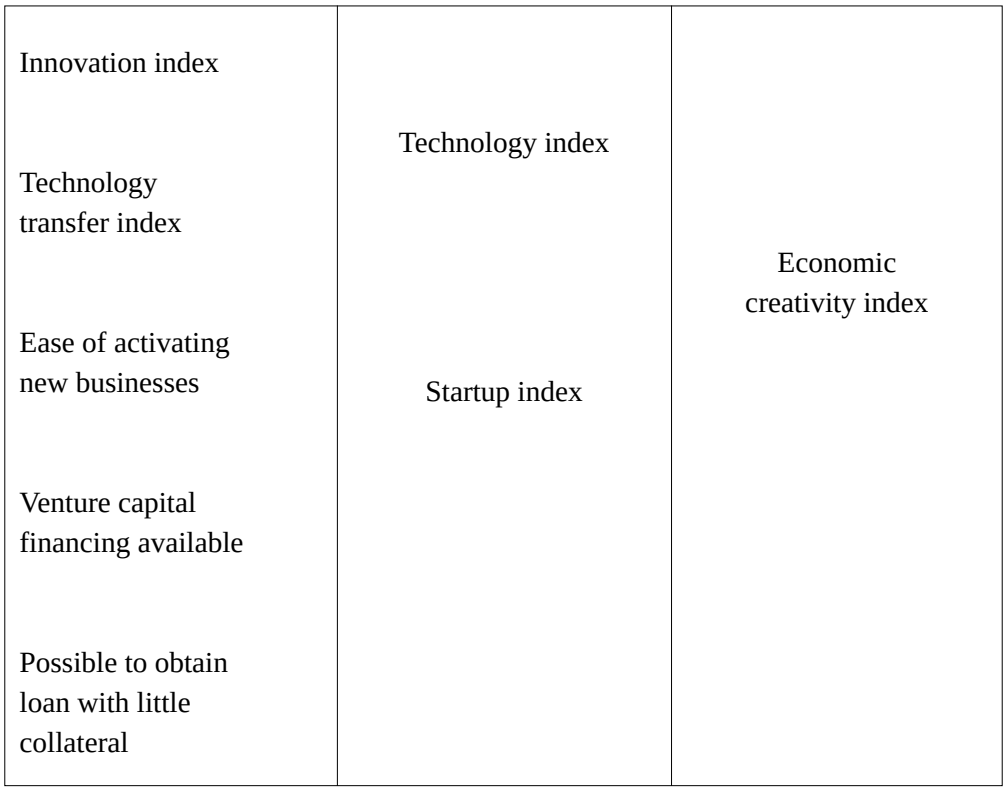
Source: *The Global Competitiveness Report 2000*, World Economic Forum.

Table 18. Economic creativity index

	Economic creativity	Technology index	Startup index
Singapore	1.63	1.95	1.31
Hong Kong, China	1.10	0.58	1.63
Australia	0.97	0.91	1.04
Taiwan Province of China	0.97	0.90	1.04
Japan	0.69	1.59	-0.21
New Zealand	0.64	0.73	0.56
Malaysia	0.59	1.08	0.11
Republic of Korea	0.50	0.82	0.19
Philippines	0.03	0.54	0.48
India	-0.03	0.32	-0.38
Thailand	-0.11	-0.07	-0.15
Indonesia	-0.32	-0.68	0.02
China	-0.56	-0.35	-0.78
Viet Nam	-0.60	-0.51	-0.68

Source: *The Global Competitiveness Report 2000*, World Economic Forum.

Figure 12. Explanation of the economic creativity index



Source: *The Global Competitiveness Report 2000*, World Economic Forum.

to include the NIEs. This trend has reinforced incentives for industrial restructuring in other developing countries of the region so that they can also benefit from this nexus.

Centred around FDI, this emerging nexus has enabled enterprises based in the developed countries to use overseas investments as a vehicle for rationalizing and restructuring their own industries in line with their changing competitive advantage. In particular, FDI, anchored on relocation of production and sourcing of industrial goods, products and processes, has increased the flow of industrial capital and technology more in line with emerging complementarities and globalization of production to meet the challenges of an increasingly unified international market. In this context, FDI-related relocation and industrial complementation could serve to reduce significantly trade friction between developed and developing countries.

Segmentation of production processes has also brightened the prospects for charting out a new pattern of specialization in the region. The ability to separate out some key manufacturing products/processes according to their factor intensity and base those products/processes in different countries has already set in motion a new pattern of borderless production which could be further strengthened. For instance, enterprises based in developed countries have separated out the production of labour-intensive products/processes to labour-abundant countries.

Further, some industrial enterprises (for instance, from Hong Kong, China; Japan; the Republic of Korea; and Taiwan Province of China), particularly the small and medium-scale enterprises which are labour-intensive and highly sensitive to price changes, have tried to avoid the loss of their international competitiveness by relocating production abroad. Different mechanisms are being applied in the Asia-Pacific region:

Growth poles

Close investment and trade relations with other Asian countries are said to be a major factor in the take-off of the Asian region. In Akamatsu Ozawa's metaphor, the process has been likened to "flying geese". In the inverted "V" formation and hierarchical structure of Asian regional economic development, Japan is the lead economy, moving ahead and leaving place for newly industrializing economies forming the first tier, with ASEAN countries in the second tier, and the third tier including China, India and Pakistan. All economies pursue an export-oriented strategy and the lead economy is a major provider of technology, complementary inputs and, in the early stages, markets. However, part of this process is in turn fuelled and magnified by rapid learning, initiation and subsequently competition, given the shortening of product life cycles.

Growth triangle

Complementing a regional or continent-wide growth cooperation strategy, there are policies for stimulating growth in certain subregions encompassing two or more countries. In this concept of growth triangles, economies of scale can be achieved in the use of skills, resources, finance, physical infrastructure and economic space. One outstanding example is the Indonesia-Malaysia-Singapore growth triangle (IMS-GT) launched in 1990, which encompasses the Indonesian Riau islands, the Malaysian State of Johor and Singapore. An interesting proposal is the Tumen River Triangle, encompassing border areas of the Democratic People's Republic of Korea, China and the Russian Federation.

Technology partnerships

These occur at various points in the value chain and have become increasingly popular in recent years. For example, IBM, Toshiba and

Siemens signed an agreement to develop a 256-megabyte chip, which was delivered to the market in June 1995. In October 1995, the agreement was enlarged to include Motorola and the firms began to develop a 1-gigabit DRAM (dynamic random access memory). NEC has entered into a similar agreement with AT&T and with Samsung from the Republic of Korea.

A frequent source of inter-firm technology agreements is the overall strategy of transnational corporations (TNCs), which find it convenient to move part of their technological activities elsewhere. Japanese companies have set up their R&D centres in Asian countries to design new integrated circuits. Toshiba is transferring all design and production of low-end video cassette recorders to Samsung Electronics in the Republic of Korea.

Similar agreements also involve foreign direct investment (FDI) by TNCs in order to shift part of their R&D or strategic management divisions to developing countries, with a view to reducing costs. For example, IBM set up a US$ 33 million joint venture with the Tata Group of India to manufacture high-end personal computers, and Nestle located two of its development centres in Singapore and Ecuador and is opening a third one in Côte d'Ivoire. Other examples include the joint development of liquid crystal displays by GEC-Macron of the United States and Varitronix of Hong Kong, China; the agreement between Motorola (United States) and Cal-Comp Electronics (Taiwan Province of China) to develop and manufacture hand-held computers for global markets; and the joint study of the causes of brain disease by Glaxo Inc. of the United Kingdom and Singapore's Institute of Molecular and Cell Biology.

The reasons for such alliances with partners from East Asia are largely based on the TNCs' reassessment of the strengths of Asian partners, which are deemed to have the technological capabilities needed for undertaking joint R&D geared to the final markets. Another reason is the proximity to manufacturers of final products. Decisions to move part of their operations to firms abroad provide TNCs with access to financial resources and talent and enable them to transfer resources at home to more sophisticated activities.

A growing number of examples of international collaboration have been recorded in the biotechnology sector, highlighting the potential for further involvement by developing country firms. A major example is that of Sime Darby, a large Malaysian agribusiness firm, which acquired a rubber research institute in the United Kingdom in the early 1980s and has since developed in-house R&D capabilities in agro-related research in Malaysia. In the late 1980s, Sime Darby and the American company International Plant Research jointly created the ASIAN Biotechnology Corporation in Malaysia to undertake biotechnology research into the application of genetic engineering techniques to perennial plants. The biotechnology sector looks especially promising for technological partnerships involving firms from developing countries because, among other things, it is intensive in human capital, which is abundant and cheap in some of the larger developing countries; it has lower financial and physical capital requirements; and it offers the great convenience of locating activities near the natural resources on which to experiment and work.

4. Key elements for change – the technology triad

New technological opportunities are being created in three spearhead technologies. It is these technologies, namely *information and communications technologies* (ICT), *biotechnology and nano technology*, that offers the most lucrative technological opportunities at the moment. Advancing themselves, merging with each other and forming combinations with other technologies, this triad will be the engine of technological change

during the next decades. The results of today's investments in R&D and education will largely be determined by the extent to which the development and diffusion of the triad technologies are stimulated.

The triad technologies share some common features:

- Each of them has emerged as a combination of a few preceding technologies. ICT came about as a result of a fusion of electronics hardware, theoretical ideas on programmable machines and communications technologies used mainly in the telephone industry. Biotechnology evolved as a merger of microbiology, biochemistry, medical sciences and industrial production technologies adapted from the chemical industry. Nano technology is slowly coming about as a result of efforts by scientists and engineers working in four separate disciplines: microelectronics, photonics, biotechnology and chemistry.
- Industries relying on the triad consume relatively small quantities of natural resources. ICT has already increased the overall efficiency of resource use and labour productivity. In the future, this trend is likely to continue and the gross domestic products of many countries will continue to shrink in weight while they increase in value. Success in nano technology could enhance the trend towards material-saving miniaturization of devices that provide essential services to the economy. Bits of information are already replacing physical goods as objects of commerce in highly industrialized countries, where households spend growing amounts of money on information and telecommunications and the growth opportunities for physical goods consumption are therefore somewhat reduced.
- Each of them seems to open up a new world to be invaded and populated by previously unseen technological creations. As biotechnology matures, new molecules, parts, functions and properties will be grown and transplanted or fed into living bodies, which can then be seen as a new domain for man-made technologies. Micro technologists are establishing micrometre-scale bridgeheads in the submicron terrain which they have reached from the more familiar fields of microelectronics, biotechnology and chemistry.
- The high-technology triad depends heavily on human knowledge and skills.

The triad technologies are going to support and enhance each other. As the spearhead technologies merge with each other and join forces with outside technologies, there is going to be a tremendous increase in technological opportunities. The opportunities are going to be exploited first in research and eventually in commercial applications. The result is the birth of several new industries. Nations that will be able to foster the creation of industries and especially small and medium-scale enterprises that focus their production on the triad technologies will have a strong competitive position.

D. Information technology and globalization: prospects and challenges for integration and competitiveness

1. Recent developments

In the emerging global economy, where ICT and e-commerce are rapidly demolishing national and international barriers, their potential to channel opportunities from across the globe is well understood. With the possibility of opportunities being made accessible more equitably for an increasingly large population in all corners of the

world in the shortest possible time, ICT has demonstrated beyond doubt its great significance for economic development. The explosion of ICT has spawned the concept of the new economy as something distinct from the old economy. This has two dimensions: a shift from manufacturing to services and a shift in production factors from physical resources to the intellectual resources of knowledge. E-businesses are the extreme example of a knowledge-based service with minimal physical assets.

In June 1999, a path-breaking study found that the Internet-based knowledge economy generated US$ 300 billion in United States revenue and created 1.2 million jobs in 1998 alone. In just five years, ICT has outpaced century-old industries in the energy sector (1998 revenue: US$ 223 billion) and could catch up with the auto industry (US$ 350 billion) next year. Also, the average revenue per Internet economy worker is about US$ 250,000 or about 65 per cent higher than their industrial economy counterparts.

While the second industrial revolution was initiated in the labour-intensive manufacturing industry by automotive pioneers like Ford, it is clear that the third revolution is driven by the knowledge-based services sector.

The year 1998 heralded not only the pre-eminence of the services sector but also the key role played by IT within that sector. Information services have become fundamental to the overall growth and development of economies around the world. For a long time, however, it was difficult to evaluate the economic impact of the IT sector. Recent studies demonstrate its positive effect on economic development worldwide. In June 1999, the United States Department of Commerce documented the strong correlation between IT and national prosperity. Its report shows that between 1995 and 1998, the IT industries contributed an amazing 38 per cent of the United States real economic growth. Also, almost half of the United States' workforce is expected to be employed in IT- based industries by 2006.

The most remarkable facet of the emerging "digital economy" is, of course, e-commerce. The Internet, which enables e-commerce, is radically changing not only the ways in which businesses serve and communicate with their customers, but also the way they manage their relations with suppliers and partners. Both the new Internet-based companies and the traditional producers of goods and services are transforming their business processes into e-commerce processes in an effort to lower costs, improve customer services and increase productivity (table 19).

The value of e-commerce transactions worldwide is growing exponentially and is expected to reach US$ 7.3 trillion by the year 2004. Driven by customer demand and business imperatives, the digital economy is becoming truly global. As of May 1999, 171 million people across the globe had access to the Internet and over half of them were in North America. While North America and Europe occupy a large absolute share of the Internet world, the Asia-Pacific region is catching up fast. It is estimated that by 2003, this region, with 81 million Internet users, will overtake Europe and become the world's second largest Internet user population. Singapore, for instance, has already launched products and services transacted electronically and it is expected that 50 per cent of businesses will use e-commerce by 2003.

The Internet, apart from enabling e-commerce, is also contributing to the rapid industrialization of the services sector. It makes it possible to simplify the production and consumption of information intensive service activities. These activities, e.g. computing, accounting, personnel, marketing and distribution, play a fundamental role not only in service

Table 19. Reduction of costs in selected industrial sectors

E-commerce reduces the cost of doing business	
Industry	**Estimated savings**
Aerospace machining	11 per cent
Chemicals	10 per cent
Coal	2 per cent
Communications	5-15 per cent
Computing	11-20 per cent
Electronic components	29-39 per cent
Food ingredients	3-5 per cent
Forest products	15-25 per cent
Freight transport	15-20 per cent
Health care	5 per cent
Life sciences	12-19 per cent
Machining	22 per cent
Media and advertising	10-15 per cent
Oil and gas	5-15 per cent
Paper	10 per cent
Steel	11 per cent

Source: Goldman Sachs.

industries but also in manufacturing and primary industries. In the United States, as much as 75 per cent of employment in manufacturing may be associated with service activities. Typically, MNCs process at home the value-added services and outsource those with high labour content to low-cost international service providers. India and the Philippines have emerged as favourite destinations for software outsourcing. Lately, however, IT-enabled services (ITES) or "remote processing", which involves using software rather than writing it, is being described as the next major driver of the technology services industry. These services (e.g. customer interaction services) typically involve a much higher degree of consumer-provider interaction and bring in more revenue. Judging by the popularity of the Internet, this knowledge-added services market is expected to skyrocket to US$ 200 billion by 2020 according to McKinsey and Co.

As businesses struggle with the huge demand for IT skills, an increasing number of them are trying to outsource these skills. The market according to the Gartner Group will be fuelled by the end users' demand for external service providers for everything from product support to e-business transformation services. In fact, business management services are projected to grow at the fastest rate of 21 per cent through 2004.

Explosive growth was also witnessed in 1999 in the global data storage management segment with new licence revenue totalling US$ 4 billion, a 47 per cent increase over the 1998 revenue. This is expected to rise to US$ 15 billion by 2004. At present, the storage management segment represents 53 per cent of the overall market. However, with strong growth in the storage infrastructure and the enterprise storage resource management segments, the share of data management is expected to drop to 46 per cent by 2004.

The International Data Corporation expects the overall data communications market in Asia-

Table 20. High-growth IT segments

	At present	By 2004 (US$)
B2B e-commerce	145 billion	7.3 trillion
IT services	605 billion	1.3 trillion
Management software	4.2 billion	14.5 billion
Database software	8 billion	12.7 billion

Source: Gartner Group, IDC.

Pacific alone to reach a value of US$ 9 billion by 2004. This will be on account of economic resurgence, liberalization of the telecommunication industry and increased Internet usage. The largest component of this will be the local-area network (LAN) market, which is likely to grow at 18 per cent over the forecast period to reach US$ 5.8 billion by 2004. The remote access market will also quadruple in the next five years to hit US$ 1.4 billion. This will be primarily due to the lack of an installed base in emerging markets. China will remain the leader in terms of total market share although the fastest growth will be in India, which will grow at a compounded annual growth rate of 36 per cent pushed primarily by the growth of the Internet and related technologies.

So, if forecasts are anything to go by, the best days are yet to come for the industry. Even if the numbers fall somewhat, manufacturers and industry watchers can be sure that there will be plenty of action in the near future.

2. The Indian IT scenario

The engine of growth of the booming Indian IT sector is the software industry, which grew at an average annual rate of 60 per cent between 1992 and 2000. The Indian software industry which today employs 160,000 professionals, has zoomed from a mere US$ 20 million 10 years ago to a whopping US$ 6.3 billion in 2000-2001, of which US$ 4 billion is revenue from exports.

The industry has clearly emerged as a major export earner for the country, contributing 8 per cent of total merchandise export. It has also achieved a worldwide reputation for providing excellent-quality services: many local software firms have obtained IS0 9000 as well as SEI-CMM certification. India has achieved this feat by leveraging its most valuable resources: highly-skilled manpower. The country today boasts of the second largest English-speaking pool of scientific manpower in the world and graduates 70,000 computer professionals every year in addition to those coming out from the prestigious Indian institutes of technology (IITs). Technical excellence explains why India was identified by 82 per cent of American companies as their top destination for software outsourcing according to a World Bank survey.

Realizing the strategic importance of IT for the country, the Indian Government has set itself an ambitious target of making India a global IT power and a key contributor to the IT world by 2008. In 1998, a national IT task force was set up and a national IT policy formulated. The policy calls for raising the software industry's turnover to US$ 85 billion by 2008 with US$ 50 billion of this coming from exports. It also proposes to strengthen the country's human infrastructure through the establishment of an Indian Institute of Information Technology (IIIT) in every state. Emboldened by the thrust given by the federal Government to IT development, 14 of the 26 state governments have already come up with their own IT policies that

Table 21. Potential for India

IT-enabled services	1998-1999		2008 (Projections)	
Back office operations/revenue accounting/ Data entry/data conversion	10 000	450	260 000	19 000
Remote maintenance and support	2 100	135	180 000	13 500
Medical transcription/insurance claims processing	4 300	160	160 000	11 000
Call centres	1 600	60	100 000	6 000
Database services	1 000	45	100 000	6 500
Content development	6 000	300	300 000	25 000
Total	25 000	1 150	1 100 000	81 000

Source: Nasscom.

aim to leverage the comparative advantages of their respective status.

The objective of the task force is to "prepare the design for building a world class regulatory infrastructure and to develop a strategic plan to raise the necessary financial resources". The recommendations are aimed at simplifying procedures for giving fiscal incentives and attracting investment in this sector.

The IT task force has directed banks and financial institutions such as ICICI and IDBI to treat "IT software and services as priority sectors for the next five years" and create venture funds to meet the credit needs of the industry. In the last two years a huge inflow of venture and angel capital for start up companies has been witnessed. This inflow has mainly focused on funding dotcoms for short-term growth. Long-term growth demands greater investment in software and emerging technologies.

Recognizing this fact, India, with its strength in innovation and software development, is now seeing a visible shift of venture-capital investment from dotcom to software and emerging technologies. According to a World Bank-funded study, India is marked by United States vendors for offshore software development. According to United States Government sources, 260 of the Fortune 1000 companies have outsourced their mission-critical software solutions to India. Strategic policy instruments are required to consolidate this leadership in the overseas market while creating, at the same time, an accelerated demand in the Indian domestic market.

In order to provide the software industry with the necessary infrastructure for development, software technology parks (STPs) were created in various states. Autonomous structures to allow self contained, self-financed, hi-tech habitats near suitable locations such as Pune, Bhubneswar, Bangalore, Hyderabad, Chennai, Noida and Delhi were set up. In these STPs, Indian companies are moving up the value chain by creating more original technologies. But unless the issue of bandwidth is resolved and a national Internet backbone created with the requisite infrastructure, the industry will not be able to achieve its projected targets. While a corporate campus in the United States has a 2.6 gbps backbone, a country of the size of India is still taking about 34 mbps, which drops to 8 mbps at places.

To encourage growth, particularly in e-biz and IT-enabled services, India needs to further ease regulatory bottlenecks. Today e-businesses are hampered by the lack of recognition of digital

signatures and of a coherent policy on security. IT-enabled services face a restrictive labour regime in some states and that will have to be eased to allow them to provide round-the-clock, round-the-year services. The McKinsey report suggests that this could be achieved by drafting labour laws to ensure 24-hour/365-day operation of IT-enabled services and by extending to this sector the concessions provided to services classified as essential under the Essential Services Act. The report also emphasizes the need to remove constraints on overseas investments by Indian players. This will allow them to make sizeable acquisitions and create large subsidiaries outside India.

The Indian IT industry is at a crossroads – to let business be as usual with a likely cycle of falling returns after the current boom is over or to seize the upcoming opportunities with some risk but much greater likely growth and future prospects.

India offers leadership in almost every aspect of outsourcing. Key opportunities of outsourcing growth are in the area of full service integration, strategic outsourcing, application server provisioning, offshore development and business process outsourcing. Many offshore application development operations around the world offer competitive services at far less the cost than their European and United States counterparts. Israel, the Czech Republic, China and the Philippines all have offshore operations and are hoping to get a slice of the growing market.

India, however, is by far the largest and most-evolved market, and according to IDC, holds an estimated 80 per cent of the offshore market share. India has become a haven for software development for many international software vendors, such as IBM, Microsoft and Oracle, all of which have shifted some of their R&D work to India. The Indian offshore firms also have the advantage of extensive experience in negotiating with United States, European and Asian firms.

However, as more offshore service providers evolve better skills, they will increasingly bring their business propositions to the client sites (offshore to onsite evolution) to take on higher-profile direct ownership of projects. Software industry grants including Microsoft and Oracle have established strategic R&D centres in South Africa and India. Services providers are also attuned to the offshore trend.

The risk to the alliances, which translates into global opportunities for India's IT services providers is the chance that unknown offshore partners will grow to become serious competitors to onshore IT service companies.

Even though offshore IT ventures have been historically perceived as high risks, they provide good working conditions, invest in on-the-job education and offer opportunities for advancement for their staff. Many facilities, especially in India, have developed state-of-the-art software technology parks (STEPS) complete with their own infrastructure, employees, housing, independent power supply and communication systems with clients globally.

In October 1999, an IT services contract estimated to be valued in excess of US$ 1 billion was awarded to a consortium of three Indian firms by the Netherlands-based ING Group - TCs, NIIT and HCL Technologies. The sheer size of the contract shows a growing confidence in offshore service providers, especially those located in India.

The regulatory mechanism may have contributed immensely to the success of the Indian ICT sector: cyber laws, telecom regulations, investment policies, capital-market regulations, procedures and taxation. For instance, income tax

exemptions for the software and services sector until 2010, zero import duty on software, less duty on IT products and favourable regulations regarding the import of software through the Internet have created an environment for growth. This was not only important for nourishing the domestic industry but was also required to generate enough confidence among investors.

E. Conclusions and recommendations

1. Policies

The greatest predicament of developing economies in reaping the benefits of the new industrial revolution through leapfrogging development is the lack of capability of their enterprises to effectively perform strategic technological innovations. They are the main actors involved and, as in developed countries, their technological innovation capabilities should be nurtured by the State. Accordingly, the starting point is inevitably to create a capacity for strategic technological innovation management in the enterprise.

Therefore, a technological innovation policy should:

(a) Foster the development of a strategic innovation culture within enterprises;

(b) Assist in the development of technology management capabilities;

(c) Provide the financing schemes required to balance the inherent risks involved;

(d) Stimulate the configuration of possible future scenarios and the vision of related business opportunities;

(e) Back up pilot and demonstration projects for strategic innovation management;

(f) Foster associations among enterprises with a view to stimulating technology transfer and learning;

(g) Promote research;

(h) Stimulate mechanisms for the creation of new technology businesses, among other initiatives.

Through proper technology policy-making, massive capabilities for R&D, technology transfer, technological services such as setting new standards, testing and certification, patenting, management of strategic business alliances, entrepreneurial development and angel and venture-capital financing will also have to be created and properly managed. In this venture, the role of concerned national, regional and international organizations should be redefined accordingly.

Four broad attributes are the main determinants of competitive advantage. These are *factor conditions (skills, infrastructure, and so on)*; *demand conditions*; *related and supporting industries*; and *firm strategy, structure and rivalry*. These attributes form a mutually reinforcing system in which the effect of one depends on the state of the others. Thus, the right factor conditions and the right supporting industries will be necessary if competition is to drive the system forward.

The examples given in this paper cover different countries where Governments have intervened in the form of sectoral trade and industry policies to change technological trajectories for comparative advantage. No Government has been content to entrust the course of economic development exclusively to the market. All the countries have consciously targeted industries that were perceived to be strategic for the economy's future growth – industries that were skill- and capital-intensive, industries that were expected to generate technological spillovers and other externalities, and industries whose products were identified as being in high demand. A similar set of industries, namely, steel, heavy and chemical industries, automobiles, electrical and electronics semiconductors and most recently biotechnology,

were identified for government support in countries like Japan, the Republic of Korea and Taiwan Province of China. The similarity in the industries assisted is remarkable given, first, the importance of these sectors to modern industrialized economies and, second, the fact that both the Republic of Korea and Taiwan Province of China consciously set out to emulate the Japanese model.

Various policies have been used to overcome factors such as coordination and information failures that prevent externalities from being realized. Again, there are great similarities across the three countries. Governments have sponsored research and development (R&D) activities designed to acquire and disseminate foreign technologies; they have used their powers over foreign investment to promote technological transfer and/or to insist that foreign investors take on local joint-venture partners. The net result was to shift production to local economies, production that would otherwise have been carried out overseas. A remarkable feature of these countries was the relatively small role played by transnational corporations.

In short, the State has intervened decisively in Japan, the Republic of Korea and Taiwan Province of China at various times to change the structure of incentives for particular industries in a manner that has significantly affected their pattern of economic development. Conclusions about the replicability of this experience with strategic trade policies must, however, be drawn cautiously. We have argued that the success of the policies pursued by these States depended on the political and institutional contexts in which they were applied. To avoid State failure in the presence of similar policies in political systems that lack the normative consensus, the exclusionary characteristics and/or the weak legislatures of Japan, the Republic of Korea and Taiwan Province of China will be more difficult. Similarly, to reproduce the elite planning agencies of these countries elsewhere, without the supporting political and economic environments, is to invite very different results. This is not to say that there is no possibility for the construction of functional equivalents to the development-promoting North-East Asian structure and agencies, but rather that other countries will have to devise their own structures rather than mimic those from an alien context.

Despite these qualifications about the application of strategic trade policies, there appears to be potential for other countries to benefit from similar policies. As we have seen, such policies are most likely to be successful when countries are still at the catch-up stage, a considerable way behind the technological frontier. For one thing, market failures are more likely to be a feature of less advanced economies. For another, as economies mature, the instruments of intervention available to the State lose their effectiveness as corporations gain increasing autonomy. And such policies may be all the more important in an increasingly integrated global economy. There is now intense competition between a growing number of economies seeking to become next-generation newly industrialized countries. One dimension of this competition occurs in bargaining with transnational corporations for a share in the global production process. State intervention to enhance the benefits that domestic economies gain from participation in global production chains may be decisive in determining the technological trajectories that countries will follow. States which fail to intervene to promote industries that generate externalities that can be captured by the domestic economy will be in danger of missing out in the struggle with economic growth.

Institutional/infrastructure facilities for technological upgrading for competitiveness and integration

The current widespread need to compete through market differentiation, brought about by

globalization and trade liberalization, has placed technological innovation and its effective management at the core of successful enterprise strategies. In order to achieve this, enterprises in developing countries have to be capable of effectively managing strategic technological innovations, through adoption of a dynamic technology strategy, to generate the new technologies, products and services that characterize the new industrial revolution. To meet this objective, apart from national Governments and other agencies concerned, international organizations have a crucial role to play.

Ultimately, an effective way to achieve sustainable industrial development in developing countries of the region is to allow them to assimilate the technologies imported and upgrade them to cater to their requirements. There is also a need to strengthen technological infrastructure including R&D and enterprise linkages, industrial engineering design, consultancy services, intellectual property rights regime mechanisms and technology promotion and transfer services. However, the experiences of many developing countries show that their R&D activities are largely carried out in isolation from the real world of production. Direct assistance in stimulating and supporting private-sector capability-development is negligible. Beyond the limited support for private-sector R&D, no suitable instrument has been designed to stimulate firms, especially SMEs, to acquire expertise and also export technologies through international technology transfer. There is now growing evidence that unless enterprises enhance their in-house technological capabilities, they cannot effectively draw on the R&D results of public-sector institutions. Similarly, a judicious selection of R&D projects in developing countries can further promote R&D and enterprise cooperation in the application of R&D results in developing countries of the region.

The early period of export-led growth in the Republic of Korea and Taiwan Province of China vindicates a number of the expectations of the institutional model. Strong State institutions expanded the freedom to manoevre of government elite and contributed to the coherence of government reform efforts. However, the political characteristics of the business-government relationship also help to account for policy differences. In Taiwan Province of China, the arm's-length relationship with business and the interest in limiting the concentration of private-sector power served to circumscribe government support for the private sector and to channel government actions into activities over which it had immediate control, such as State-owned enterprises. In the Republic of Korea, by contrast, the Government's greater political dependence on the private sector encouraged closer institutional linkages between the State and business and led to more direct government support of industry, particularly through the financial sector.

Often, protectionist constraints on the labour-intensive, export-led growth strategy and increasing pressure to open the domestic market forced a change in industrial strategy. To maintain the forward momentum in complex high-tech industries, the Government forged closer relations with the private sector, both gaining greater representation in the policy-making process and extending more differentiated forms of assistance.

It can be seen, however, that more purely political factors were also at work. First, the very success of economic development increased the relative size of the private sector as a whole vis-à-vis the State-owned enterprise sector. Large private groups also emerged. The organizational capabilities of the private sector increased accordingly. Even more important, however, was the increased dependence of Kuomintang (KMT) business backing. As electoral policies became a more important component of the KMT's ruling strategy, the quest for sources of political funding

became more intense, the barriers separating the party from the private sector blurred, and the autonomy of the technocrats vis-à-vis business interests declined.

Government policies and the strategies of firms have shaped the particular pattern of development of the Republic of Korea's industry. Foreign firms originally played a catalytic role in the launching of the Republic of Korea's electronic exports. In the mid-1970s, the Government and the chaebol (large conglomerates) began to play an increasingly important role. In order to highlight some peculiar features of the interaction between business and government institutions and its impact on the country's electronics industry, one may look at earlier developments in Japan, which for all practical purposes guided the Republic of Korea's policy interventions and strategies as an implicit role model. Given its overwhelming concern with the rapid expansion of production capacities and market share, the Republic of Korea has copied a number of Japanese policy instruments. Three of them are of particular importance: (a) a sophisticated mixture of import restrictions and export promotion; (b) an emphasis on aggressive absorption of foreign technology while restructuring foreign investment; and (c) a focus on creating national champions through sectoral targeting.

Such similarities, however, should not be exaggerated and important differences continue to exist between the countries, especially in terms of industry and government institutional structures and the resulting competitive strategy of firms. These differences reflect the idiosyncrasies in the development of the institutions and organizations in both countries, as well as the fact that Japan started decades earlier than the Republic of Korea to expand into the international electronics markets, and thus had to confront less demanding and complex competitive requirements. In the case of the Republic of Korea, the very same feature of government policies and firm strategies and the resulting industry structure that until the late 1980s were conducive to the rapid expansion of the Republic of Korea's electronics export have now become important constraints on attempts to sustain the Republic of Korea's export performance through upgrading of its technological capabilities.

Samsung's technology development paths have been an evolutionary process. Although performance improved very sharply, this impressive development resulted from numerous incremental improvements which materialized in a short time. Thus, better performance has come from sustained vigorous hard work in cooperation with R&D institutions rather than a one-shot technological breakthrough. In particular, those processes have revealed a kind of heuristic developmental path involving different institutions rather than an automatic step-wise technological process. Before realizing any technical progress at certain points of development paths, technological development activities were carried out under bounded rationality with a very short time horizon even though the company had long-term development visions and milestones in mind. In other words, the progress path has been a continuous trial-and-error process and only adhoc management was possible.

Information technology accessibility and use

Over the last few years, information technology (IT) has emerged as a vehicle for accelerated socio-economic development around the world. While the developed countries continue to provide major markets for IT-related products and services, the impact of IT has begun to be felt in a significant manner by some developing countries also. IT can provide solutions to their basic problems of growth and development.

Major transformations are occurring in the formal education sector and other organizations that

play a key role in enabling people to develop new capabilities. These changes are partly the result of the increasing use of IT as enabling technologies for education and learning. The extension of more affordable communication networks enables networks among communities of interest supporting the exchange of scientific and technical information as well as sharing knowledge about all aspects of business and everyday life. The application of IT leads to more flexible learning environments. The feasibility of interactive learning (between teachers and learners, between computer-based software applications and learners, and among teachers and learners themselves) is becoming a reality for some people in developing countries. In other countries, it is a technical possibility that may become a cost-effective alternative to traditional forms of education in future. The postscript of continuous informal education and lifelong learning is growing with the increased availability of IT applications and their use to address development problems.

In developing countries, the potential of the application of IT in these areas is only beginning to be realized. For example, there are now sufficient examples of both successful and unsuccessful initiatives to allow some lessons to be drawn. The use of IT in support of formal and informal education offers the potential to strengthen the capabilities of the populations in developing countries, with the expectation that this in turn will strengthen the science and technology base. However, this potential can only be exploited if the formal and informal education process in developing countries allows people to acquire the skills that are necessary to use new technologies creatively and productively. The task cannot be left solely to the education and training opportunities offered by the manufacturing and services firms in the business sector.

Major changes in formal education systems and institutions as well as the organizations that contribute to informal learning are needed to build new capability. The introduction of lifelong learning strategies requires that the foundation of learning be strengthened and changed. It also implies that there must be flexibility for movement between education, training and work and new roles for private- and public-sector institutions that contribute to the learning process.

The knowledge networks that support science and technological innovation are becoming increasingly international. They involve a growing number of various types of research and higher educational institutions. Recent empirical evidence suggests that in the 1990s scientific research has generally involved teams of people working in different institutions in the same country or around the world. Science and technology networks are becoming the norm rather than the exception. Researchers working independently cannot hope to have the full range of skills, equipment and materials needed to carry out modern scientific research. Scientists are engaged in a continuous learning process involving the recombination of codified information and tacit knowledge to generate new knowledge. The changes in the research process are enabled by IT applications in a wide range of fields of expertise and they require specific skills in the use and application of IT by the research community. The strengthening of the overall science and technology base in developing countries is closely associated with the capability of the general population. The broader diffusion and effective use of IT to address developmental problems requires the development of new competencies in all areas of society to enable the creative application of IT.

Although it offers considerable potential, there are questions about potentially negative impacts of greater access to the world stocks of information as a result of connection to global networks. If this information is to be combined effectively with local knowledge, there will be a

high cost in terms of investments in new forms of education and in achieving greater computer literacy in the business community and civil society. When there are inequalities in both access to networks and in the distribution of the relevant competencies, there is a risk that the introduction of IT applications will be divisive.

The recent attempts by some developing countries to strengthen their education systems by using IT provides insufficient evidence to reach any clear conclusions about whether the benefits will include a reduction in social and economic inequalities. However, the evidence suggests that much greater attention needs to be given to the organization of education and training when IT is introduced and to the associated infrastructure (for example, electricity, transport, currency of education and training content, and responsiveness of content to local economic, cultural and political settings).

The industrial sector in developing countries, especially the SME sector, has been slow in embracing the benefits of IT to enhance its productivity. One recent survey estimated that a large segment of SMEs invest less than 0.4 per cent of their sales turnover in IT. However, the recent thrust of technology in general and IT in particular has encouraged much greater institutional support for IT based allocations. The benefits realized from such institutionally-backed IT induction is motivating more and more enterprises to invest directly in this area, covering a wide spectrum of traditional sectors like handicrafts and the garment industry and non-traditional sectors like electronics.

Agriculture and other rural-based economic activities make a large contribution to the economy of many developing countries of the region. In order for IT to have a larger and sustainable impact, it must focus on the economic activities in which people in rural areas are traditionally active. Although individual units may not directly use IT tools, community-based services provided in rural areas will have a significant impact on productivity enhancement and increased income generation. Recommendations for IT-led development projects include:

- Identification of areas so that the benefits of IT make a positive impact on the income generation capacity of a large number of people engaged;
- Development of strategies keeping local socio-economic conditions in mind;
- Promotion of horizontal transfer of successful experiences of IT induction from one region to another with similar socio-economic conditions;
- Provision of marketing support and wider national and international exposure to efforts at local level.

2. Regional cooperation

In addition to various measures at the country level for the acquisition of technological capabilities, there are many cooperative measures that countries of the Asia-Pacific region can undertake together for mutual benefit. Rather than listing all of them, the following three are proposed:

(a) Networking of R&D institutions in the region

The prospect of establishing a network of major R&D institutions and industrial enterprises should be explored to meet manpower training and other demands of the industrial sector on a cost-sharing basis. Perhaps, a linkage to institutions in advanced countries should also be looked into. In addition, networking can contribute towards better utilization of limited resources in the region.

(b) Establish a regional "technical wing"

A so-called "technical wing" is required to meet the need to strengthen the science and

technology infrastructure and to improve the technological capabilities of the less developed countries. In this sense, "technical wings" exist in some form at the national level. Our suggestion is to extend national wings to a regional one.

This regional technical wing should organize and equip itself for the provision of essential services to Governments of member countries and to the private sector for problems that can be handled more efficiently on a regional basis. It can promote collaborative efforts in R&D among institutions in the member countries, governmental as well as private. It can also provide "consultancy" services and advice on matters regarding product standards, patents and promote linkage of R&D with industries in order to meet the changing market conditions. Many problems may be solved more easily if they are dealt with at the regional, rather than national, level.

One function of the technical wing is to establish and maintain an up-to-date database for S&T activities in the region. The database should be continuously updated and maintained. It should also keep abreast of ongoing programmes and activities in R&D and industrial development, particularly those funded by aid agencies. The overriding objective of this database should be to provide assistance to private-sector enterprises in member countries in their pursuit of technological capabilities. Private-sector enterprises are most sensitive to technological trends and market forces. In this sense, they are best fitted to play the role of the agent of change and the Government should provide them with support so that they can do the leapfrogging in S&T.

(c) Establish a regional consultancy on S&T policy and management

With the increased understanding of the role of technology in the industrialization process, new emphasis has been put on the need for less developed countries to keep following technological changes through the choice, acquisition and adaptation of new and improved technologies and industry. What many people are less aware of is the fact that research and development in the field of S&T is a major determinant for technological capability. It is deemed imperative therefore that some mechanism be devised to comprehensively address these needs in the region.

A regional S&T consultancy with the necessary expertise and resources can contribute significantly developing organizational bases for S&T development in the member countries. Sharing of experience and the lessons of early starters in these endeavours is an additional advantage. The regional consultancy should undertake a comprehensive study of prevailing conditions for S&T development in member countries in order to identify problem areas and provide services to resolve them in the area of S&T policy formulation, implementation and management. To be more specific, the consultancy should take the following factors into consideration:

- Appropriate choice of technology consistent with the socio-economic development plans of the member countries;
- Strategies for technology acquisition, adaptation and diffusion;
- Upgrading of existing indigenous technologies;
- Structuring trade and investment for industrial transformation;
- Encouraging increased participation of dis-advantaged groups in both urban and rural areas.

In view of the emerging new global order of technological competitiveness, a coordinated, international approach within the Asia-Pacific region is necessary to increase the effectiveness of the technology development infrastructure by

providing a focused approach based on diverse experiences of economies of this region. The countries of the ASEAN region have a reasonably strong manufacturing infrastructure and skilled labour base and can thus extend intercountry cooperation to diverse areas including S&T. This envisages cooperation between member countries in the area of S&T. Of particular importance is the concept of cost-sharing of contract research, which has proved to be an effective instrument to encourage collaboration between industries/ companies located in different member States. There is therefore a strong need and potential for multi-country and multi-enterprise partnerships among the economies of the Asia-Pacific region to bring about economic growth and prosperity for these economies.

V. THE REPUBLIC OF KOREA'S INDUSTRIAL DEVELOPMENT, GLOBALIZATION AND THE PROSPECTS FOR REGIONAL AND GLOBAL INTEGRATION

Seong Somi [51]

A. Introduction

Throughout its development process, the Republic of Korea benefited greatly from globalization. The Republic of Korea's export-led growth strategy was based on the global trade liberalization trend. Access to global capital markets was another favourable environment for the Republic of Korea to launch investment-driven economic development projects. Through international borrowing, the Republic of Korea could alleviate the weakness in capital accumulation that developing countries commonly face at their early stage of development. However, since the beginning of the economic crisis in 1997, the Republic of Korea also learned how globalized capital markets could be a threat to domestic economic stability. Actually, the Republic of Korea' s currency crisis could not be fully explained by fundamental weaknesses in the domestic economy. The Republic of Korea has been carrying structural weaknesses for more than three decades but it did not have a major currency crisis before. Many economists conjectured that the globalized and digitalized international capital market and its inherent instability contributed to triggering the country's currency crisis in 1997. By that time, the Republic of Korea with its already liberalized capital market was wide open to risks.

Owing to the crisis, the Republic of Korea had to pay tremendous economic and social costs. Bankruptcies of financial institutions and enterprises leading to large-scale unemployment influenced the welfare of the country's people overwhelmingly. The adjustment to the shock of the economic crisis is still going on and the Republic of Korea is still under a heavy burden of restructuring. While the economic crisis was quite an ordeal for the Republic of Korea, it also provided an opportunity to accelerate structural adjustment, in both the financial sector and the real sector. Throughout the restructuring, the Republic of Korea's labour market became more flexible and incentives to establish new risky businesses with high potential returns, so called "venture business", were heightened.

The following section gives a brief history of the development of the Republic of Korea and the role of globalization in the past and the present. Then, the trend and situation of foreign direct investment in the Republic of Korea are examined, as is the Republic of Korea's overseas investment. The FDI patterns show the increasing importance of regional and global cooperation in East Asia.

B. Overview of the industrial development process in the Republic of Korea

A set of policies and institutions can be a winning strategy only in a certain environment during a certain period. The same policies and institutions could turn out to be a disaster in a different context. The Republic of Korea used to be envied by many developing countries as a model of the "East Asian miracle".[52] Many economists

[51] Korea Development Institute.

[52] World Bank, *The East Asian Miracle* (New York, Oxford University Press, 1993).

discussed and praised the Republic of Korea's merit-based bureaucracy and market-oriented economic policy. But after the currency crisis of 1997, the Republic of Korea has been downgraded to a country with crippled financial institutions, debt-ridden corporations and a Government incapable of handling short-term instability and long-term structural problems.

Below, we examine the process of industrial development in the Republic of Korea since the early 1960s to the present in the context of globalization and regionalization. The Republic of Korea has undergone four somewhat distinct phases over the period from 1961 to the present. The first phase, from 1961 to 1972, was one in which major policy reforms and institution-building were undertaken to promote export-oriented industrialization. In the second phase, which began in 1973 and continued through 1979, the "heavy and chemical industry" drive was implemented through subsidized credit and special tax policies, selective protection, entry restrictions and direct Government involvement in industrial decision-making. In the third period, between 1980 and 1996, the Government pursued the same export-oriented strategy while emphasizing domestic price stability and market liberalization. And the fourth phase is the period beginning in 1997, the year of the Asian currency crisis.

1. Initiation of export-led growth: 1961-1972

The Park Chung-Hee administration initiated an export-led growth strategy in the early 1960s. The Republic of Korea realized that, given its small domestic market but relatively well-trained labour force, it had to adopt an export-oriented policy for industrialization. A series of policy reform programmes were introduced. The currency was devalued in May 1964 from 130 to 255 won per United States dollar and in March 1965 a unitary floating exchange rate was adopted. In September 1965, interest rates on both bank deposits and loans were raised sharply to increase voluntary private savings and discourage unproductive use of bank credit. The one-year time-deposit rate was increased from 15 per cent to 30 per cent, and interest rates on loans rose to between 26 per cent and 30 per cent. By widening the gap between domestic interest rates and foreign rates, this interest rate reform greatly increased the business sector's incentive to borrow from abroad. These efforts to mobilize both domestic and foreign savings made possible a significantly higher ratio of investment to national income after 1965. The 1965 interest rate reform also enabled the Government to strengthen its control over finance. During the 1960s, the Government nationalized all commercial banks and established many State-owned specialized banks. With this control over finance, the Government could closely manage and monitor the progress of industrial investment, development projects and export performance.

Selected import markets were liberalized to supplement the outward-looking strategy. Since high-cost or low-quality domestic inputs could injure the competitiveness of exports, tariffs and import controls had to be rationalized. However, most domestic markets were protected until the end of the 1970s. Along with these policy measures, the Government intensified incentives to exporters. The export incentive system allowed exporters to deduct various taxes (domestic commodity taxes, business taxes and income taxes), giving them accelerated depreciation. A formal system of wastage allowances permitted exporters to import, on preferential terms, a greater amount of intermediate inputs than required in production. Among these incentives, the export credit subsidy was the most significant incentive scheme.

The export credit subsidy system played a critical role in supporting export industries until the mid- 1980s, when the Republic of Korea's current account recorded a surplus. The essence of the system was the Bank of Korea's automatic

Table 22. Major indicators of the Republic of Korea's economic growth, 1963-1995

Year	Export growth	GDP growth	Wholesale price index	Per capita GNP (US$)
1963	9.0	9.1	19.4	100
1964	23.5	9.6	34.9	103
1965	35.9	5.8	10.3	105
1966	42.4	12.7	8.6	125
1967	32.7	6.6	6.5	142
1968	39.5	11.3	8.1	169
1969	36.1	13.8	6.9	210
1970	19.6	7.6	9.4	252
1971	20.9	8.8	8.6	288
1972	36.6	5.7	13.8	318
1973	55.3	14.1	6.9	395
1974	-2.8	7.7	42.1	540
1975	15.9	6.9	26.5	590
1976	41.6	14.1	12.2	797
1977	22.6	12.7	9.0	1 008
1978	19.9	9.7	11.6	1 392
1979	-3.8	6.5	18.8	1 640
1980	9.7	-5.2	38.9	1 589
1981	17.3	6.2	20.4	1 719
1982	6.2	5.6	4.7	1 773
1983	13.8	9.5	0.2	1 914
1984	8.1	7.5	0.7	2 044
1985	2.1	5.4	0.9	2 242
1986	26.6	12.5	-1.5	2 568
1987	36.2	12.3	0.5	3 218
1988	12.8	12.0	2.7	4 295
1989	16.3	6.9	1.5	5 210
1990	14.4	9.6	4.2	5 883
1991	17.5	9.1	5.4	6 757
1992	2.9	5.0	2.2	7 007
1993	3.4	5.8	1.5	7 446
1994	13.8	8.4	2.7	8 483
1995	30.3	8.7	4.7	10 076
1996	3.7	6.9	3.2	11 380
1997	5.0	5.0	3.8	10 307
1998	-2.8	-6.7	12.2	6 742
1999	8.6	10.7	-2.1	8 581

Source: KDI, *Major Indicators of the Korean Economy.*

rediscounting policy, which supplied credit via commercial banks to exporting firms, which received letters of credit. The central bank's discount loans were also extended to pre-shipment exports, as well as to imports of raw materials and intermediate goods for export use or to the purchase of export contents from local suppliers. The export-oriented growth strategy provided effective performance tests for firms. The Government's support for exporting firms was based on export performance. Exporters eligible to receive Government support were limited only to those whose past year's exports exceeded a target amount. To get more privileges, exporters had to work hard to compete with each other and foreign businesses. In this way, the Government maintained an efficient allocating device for picking winners and was able to reduce the risk of an "interventionist approach".

The Republic of Korea's economic record during 1963-1972 was quite impressive. As shown in table 22, the growth in GNP averaged more than 9 per cent a year, and per capita income in 1972 was around US$ 310, more than double the level of 10 years before in real terms. The average manufacturing growth rate during the decade was about 18 per cent. The share of manufacturing output to GNP rose sharply from 11 per cent in 1960 to 26 per cent in 1972, while the share of agriculture fell dramatically from 41 per cent to 25 per cent during the same period. Manufactured exports from the Republic of Korea rose from less than US$ 10 million in 1962 to about US$ 1,365 million in 1972. Manufactured exports accounted for nearly 85 per cent of merchandise exports in 1972.

The export-oriented growth strategy was a wise choice but it was not the only reason why the Republic of Korea's economy performed so well during the period 1963-1972. The Republic of Korea had a well-trained labour force and dynamic entrepreneurs. The world trade environment was also favourable to developing countries in the 1960s.

2. The heavy and chemical industry promotion phase : 1973-1979

The shift from general export promotion to the heavy and chemical industry (HCI) drive was announced in 1973 by the late president Park. The HCI drive was motivated by the need for industrial deepening and national security. Industries such as shipbuilding, automobiles, steel products, non-ferrous metals and petrochemicals were favoured by the HCI promotion.

The promotion of HCI was supported by a broad range of policy instruments. A new Tax Exemption and Reduction Control Law (1975) gave five-year tax holidays and investment tax credits, and accelerated depreciation to designated industries. The commodity tax exemption previously available to all exporters was withdrawn. Important export privileges were reduced, including wastage allowances, public utility subsidies and the scope of export credit. The macroeconomic consequences of the HCI drive further injured export industries. Since the high rate of capital formation was supported partly by rapid monetary expansion, inflation accelerated. However, the nominal exchange rate was held constant to minimize the pressure on prices. The result was a sharp appreciation of the real value of the won and a significant decline in the competitiveness of export industries.

Among various Government supports, financing was the most critical factor since HCIs require huge amounts of capital. With limited domestic savings, the Government had to actively seek foreign capital. At that time, the country's entrepreneurs' abilities to attract foreign capital were very limited owing to the low creditworthiness of domestic firms. The Government, in response, began to guarantee the reimbursement of all foreign loans, regardless of whether they were initiated by public or private companies. Along with the massive credit supports, the Government

overhauled the education and training systems to promote and secure engineers and skilled workers into HCI. Training centres, technical high schools and engineering colleges were expanded in both quality and quantity. The Government also introduced a skills-licensing system to encourage all workers to possess at least one skill.

In addition, for each field of engineering the Government actively recruited outstanding Korean scientists abroad and established a modern laboratory where research on the improvement of production technologies was encouraged in collaboration with industry researchers and university professors. The HCI drive resulted in a rapid change in the industrial structure. The share of HCI in GDP was only 11.9 per cent in 1970, but increased to 26.3 per cent in 1980, exceeding that of light industry. The HCI drive plan also contributed to stimulating import substitution efforts. The import coefficient dropped from 36.9 per cent in 1970 to 23.7 per cent in 1980. Furthermore, the share of HCI products in total exports rose substantially from 12.8 per cent in 1970 to 38.3 per cent in 1988. These results indicate that the Republic of Korea achieved a full set of industries (light industry, HCI and defence industry) in a short span of time.

The export structure was also shifted from labour-intensive to capital-intensive products by the early 1980s, even though textiles and garments still occupied the largest share of exports. Capital-intensive products like ships and steel replaced light manufacturing exports such as wigs and plywood. Although costly to establish, these capital-intensive industries eventually obtained international competitiveness and may be described as successful infant industries. The share of export production in HCI rose substantially from 7.4 per cent in 1970 to 19.3 per cent in 1980. The ratios were relatively low in chemicals and primary metal manufacturing but higher in metal products and machinery. In electronics and transport, especially, the ratios were even higher than those for textiles in the early 1980s.

The active Government role resulted in excessive money creation, which, in turn, produced high inflation with various signs of macroeconomic imbalances. Two oil price shocks experienced in this decade, one in 1973 and the other in 1979, also worsened the inflationary situation. In this period, the Republic of Korea achieved economic growth of 8.5 per cent annually but experienced relatively high inflation, of 15.2 per cent annually, generating concern that the growth could not be sustained without strong corrective measures to curb the inflationary pressure.

3. Stabilization, liberalization and renewed growth: 1980-1996

The 1980s began with strong anti-inflationary policy measures on the part of the Government. The monetary growth was decelerated and fiscal expenditures were tightened. The HCI drive was toned down. Also, efforts were made to change the degree of Government intervention in resource allocation. Along with the stabilization programme, the Government slackened the reign of credit control, which was tightened in the process of the HCI drive, and abolished all preferential lending rates. Hoping for the development of the domestic financial market, the Government sold most of the commercial banks to the private sector. Deregulation and market opening were also advocated and adopted as part of the general economic policy stance but not in full force.

For the first half of the 1980s, the Republic of Korea succeeded in curbing inflationary pressures as the stabilization programme was firmly maintained at a cost of the low-growth performance. As shown in table 22, the wholesale price index fell from 38.9 per cent in 1980 to 20.4 per cent in 1981, 4.7 per cent in 1982 and 0.2 and 0.7 per cent, respectively, in the two subsequent years. During the period from 1986 to 1988, the

Republic of Korea experienced a strong economic boom thanks to favourable external conditions, namely, the so-called "three lows": (a) the low dollar and won vis-à-vis the yen, (b) the low international interest rate and (c) the low oil price. The Republic of Korea enjoyed this opportunity with a sizeable current account surplus, a double-digit growth rate and low single-digit inflation. Being trapped in success, however, the Government as well as the private sector failed to make serious efforts at structural adjustment and a shift in policy regime.

An import liberalization programme was adopted in 1983, by which time the country's economy had almost corrected the severe external imbalances caused by the second oil shock. With the completion of the five-year liberalization programme for 1984-1988, the import liberalization ratio was raised from 80 per cent in 1983 to over 95 per cent. About three quarters of the items remaining under restriction were primary products, foods and beverages. Together with the reduced quantitative import restrictions, the average nominal tariff rate was gradually lowered from 24 per cent to 13 per cent between 1983 and 1989. Compared with a very restrictive policy towards foreign direct investment in the 1960s and 1970s, the Government gradually relaxed the restrictions on foreign direct investment in the 1980s and 1990s. The Foreign Capital Inducement Act was revised in 1984 to switch to a negative list system, to establish an automatic approval system and to abolish restrictions on the repatriation of capital and the foreign ownership ratio. The proportion of the Republic of Korea's industrial subsectors open to foreign direct investment increased from 44 per cent in the 1970s to 66 per cent in 1984 and 90.6 per cent by 1994. In addition, in response to complaints from foreign investors that the Republic of Korea was the most unattractive country to invest in owing to extremely cumbersome bureaucratic red tape, in 1995, the Government introduced the automatic approval system, the expansion of tax and other incentives for investments in strategic high-technology sectors and a "one-stop-service" centre.

The downturn in 1989, due to the deterioration in external economic conditions and the economic ups and downs since then, again brought back the typical interventionist role of the Government in economic management, although this time for different purposes. The so-called "balanced industrial structure" between *chaebol*, which is a legacy of the HCI drive, and small and medium-sized firms was thought of as the most important element for increased industrial competitiveness. This policy contributed to the liberalization of the Republic of Korea's financial market, as the very powerful *chaebol* wanted liberalization so that they could get greater access to foreign capital. Efforts to upgrade industrial competitiveness by boosting more investment through easy financial credits in a short time, in addition to financial support for small and medium-sized firms, inevitably created an expansionary economic situation. The inflation rate increased to nearly double digits in 1990 and 1991.

4. The financial crisis and thereafter: 1997-present

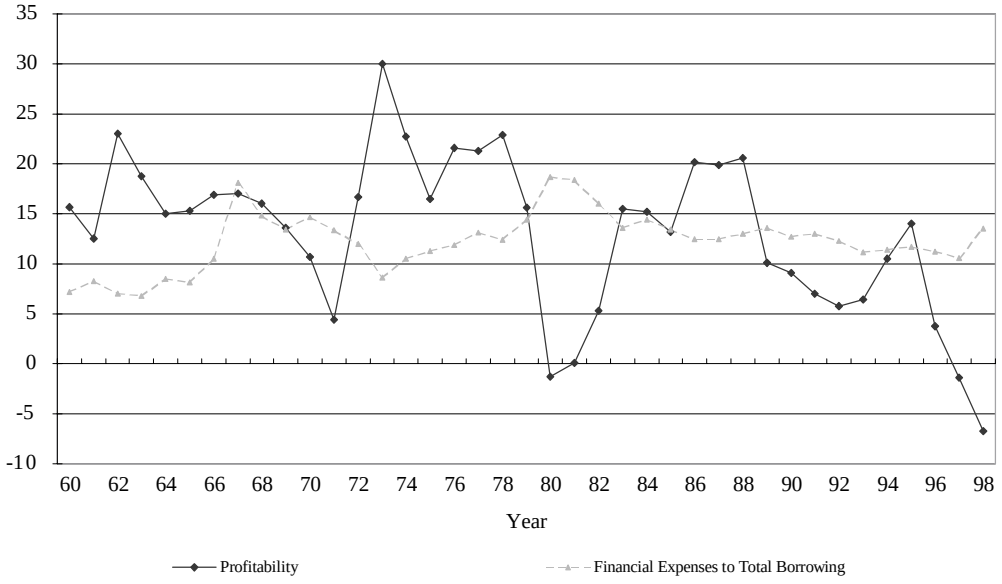
By the mid-1990s, the Republic of Korea's real sector and financial sector were wide open to external shocks. Structural problems remained unresolved and the system risks were increasing. However, the prompt introduction of measures to alleviate system risks was lacking in the Republic of Korea. Although the Government no longer pursued traditional industrial policy, it retained some important levers of control. In particular, it continued to control the banks and market entry through licensing decisions. The Government also appeared to provide implicit guarantees on loans. The *chaebol* groups, in turn, exploited the residual influence of the Government to extract favours and carry out ambitious investment projects with little concern for insolvency risks. But the Government-business risk-sharing partnership was being shaken

in an era of liberalization and democratization.

In 1995, the average debt-equity ratio of the top 30 *chaebol* groups was 347.5 per cent. The lower ranking firms (No. 11 to No. 30) had been earning a negative average return on assets since 1993. Halla, Jinro and Sammi, in particular, had a debt-equity ratio of over 2000 per cent as they piled up losses. Financial institutions, however, continued to provide credit to these companies. In 1996, the average debt-equity ratio of the top 30 *chaebol* groups climbed to 386.5 per cent, but the financial institutions still propped up the debt-plagued conglomerates. In April 1996, the Republic of Korea's terms of trade began to decline sharply as the prices of semiconductors collapsed. The decline in the terms-of-trade reached 20 per cent by the end of the year, and it turned out to be the Republic of Korea's biggest terms of trade shock since the oil shock. In 1997, the average debt-equity ratio of the top 30 *chaebol* groups reached 519.0 per cent. The Republic of Korea was on the brink of yet another debt crisis.

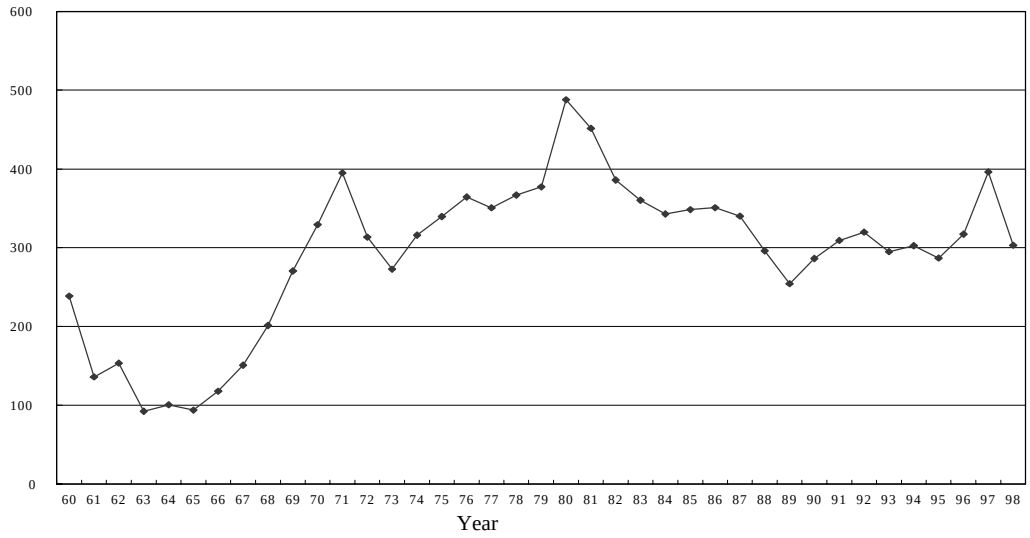
Figures 13 and 14 illustrate the basic nature of the problem with the country's corporate sector. Republic of Korea firms have relied excessively on debt financing, even when carrying out massive investment projects with a long gestation period. Figure 14 shows that since Republic of Korea firms dramatically increased their leverage in the second half of the 1960s, the average debt-equity ratio remained above 300 per cent for most of the pre-crisis period. Figure 13 shows that prior to the economic crisis of 1997, there were only two subperiods during which the profitability of Republic of Korea manufacturing firms was significantly above the opportunity cost of capital: (a) 1972-1978, when the corporate sector's debt burden was artificially reduced by the Emergency Decree of 1972 and the low-interest rate policy during the ensuing HCI drive; and (b) 1986-1988, when the country's economy enjoyed the so-called "three-low" boom characterized by low oil prices, low international interest rates and a low value of the won relative to the Japanese yen after the Plaza Accord of 1985.

Figure 13. Profitability and opportunity cost of capital in the Republic of Korea



Source: Bank of Korea, *Financial Statements Analysis*, various issues.

Figure 14. Average debt-equity ratio of the Republic of Korea's manufacturing sector



Source: Bank of Korea, *Financial Statements Analysis*, various issues.

The evolution of the Republic of Korea's economic system over the past four decades indicates that the debt crisis of 1997 was not really a unique event – as compared with the crisis of the early 1970s and 1980s. The economic crisis of 1997 had some features of a liquidity crisis accompanied with low foreign reserves, heavy reliance on short-term foreign debt, and loss of confidence by foreign investors. However, the fundamentals and the realization of a bad equilibrium do not explain the whole picture of the country's currency and economic crisis. The Republic of Korea was running with incorrect fundamentals for more than three decades. *Chaebols* overborrowed for more than three decades. Simply overborrowing itself does not explain the cause of the Republic of Korea' s financial and currency crisis. My conjecture is that the increased instability of the international financial market in an era of globalization and digitalization is one of the critical causes of the currency crisis in the Republic of Korea.

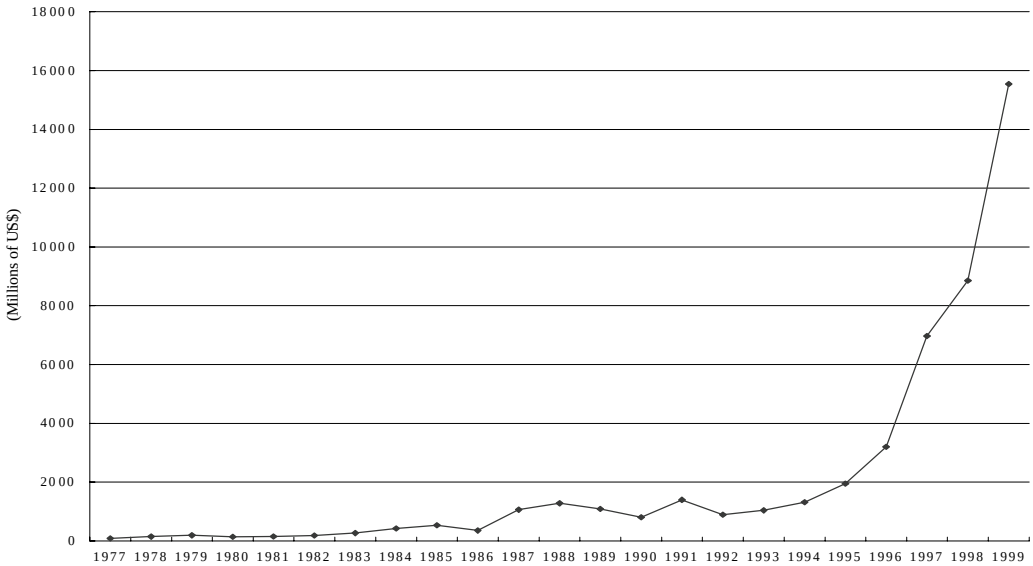
C. Foreign direct investments and prospects for integration and complementation

1. FDI inflow into the Republic of Korea

FDI inflow into the Republic of Korea was not significant until the mid-1980s. In 1985, the total FDI inflow amounted to a mere US$ 530,000. The Republic of Korea's Government was in favour of foreign borrowings rather than FDI. Companies in the Republic of Korea also relied on debt financing more than equity financing. However, FDI inflows have increased dramatically since the mid-1990s. In 1999, FDI inflow into the Republic of Korea reached US$ 15.5 billion (see Figure 15).

This increase is attributed to the liberalization of FDI, including the further opening of business areas, liberalization of mergers and acquisitions by foreigners and the simplification of investment procedures. In 1998 especially, , the Government enacted unprecedented liberalization measures, including the full liberalization of hostile mergers and acquisitions to induce FDI for the economic recovery. As a result, FDI, especially that related to mergers and acquisitions by

Figure 15. Trends of FDI inflows into the Republic of Korea



Source: MOCIE (Ministry of Commerce, Industry and Energy).

foreigners, surged even despite the economic turmoil. Estimates show that foreign-involved mergers and acquisitions accounted for about 53 per cent of FDI into the Republic of Korea in 1998.

The surge in FDI can be attributed to an interaction between the Government's new measures and changes in economic factors. The economic crisis, which began in 1997, shrank domestic markets and brought about macroeconomic instability, discouraging local market-oriented FDI. However, this negative impact on FDI appears to have been surpassed by a number of positive impacts arising from the crisis. Asset prices have fallen sharply, making mergers and acquisitions by foreigners much easier. And the depreciation of the Republic of Korea's currency as well as a decline in the cost of production have made it advantageous for foreign investors to produce and export in the Republic of Korea. Also, since the crisis, global firms have increasingly recognized the strategic importance of the Republic of Korea in the East Asia region. In addition, foreign investors' growing positive perception about the Republic of Korea's economic recovery seems to have contributed to increasing FDI.

The motives of FDI in the Republic of Korea have changed over time. Until the mid-1980s, low-cost labour was the main advantage of investing in the Republic of Korea. As wages increased after the mid-1980s, an increasing proportion of FDI was made to penetrate into attractive domestic markets and, recently, this market-oriented FDI has been predominating. The manufacturing sector has been the largest recipient of FDI, but its share has been declining over time. FDI in the primary sectors of agriculture, fishing and mining has been insignificant, but the share of the services sector has been steadily increasing in line with the continued liberalization of FDI (see table 23).

In the manufacturing sector, chemicals, electricity and electronics, transport equipment and machinery have been the main recipients of FDI. FDI in the food sector and into paper and lumber has recently increased sharply. In the services sector, the finance and the hotels sectors have been the largest recipients of FDI. FDI in wholesale and retailing has also increased prominently in recent years. The United States and Japan have been the main investors in the Republic of Korea for more than 30 years. But Japan's share of FDI in the

Table 23. Sectoral distribution of FDI inflow into the Republic of Korea

(Millions of US$; percentage)

	1962 to 1971		1972 to 1981		1982 to 1991		1992 to 1999	
Agriculture and fishery	**2 096**	**0.8%**	**12 712**	**0.8%**	**8 557**	**0.1%**	**250 914**	**0.6%**
Mining	**312**	**0.1%**	**5 973**	**0.4%**	**9 890**	**0.1%**	**58 140**	**0.1%**
Manufacturing	**231 441**	**87.0%**	**1 158 329**	**72.4%**	**4 829 675**	**65.2%**	**19 608 571**	**49.3%**
Food	5 710	2.1%	52 734	3.3%	327 168	4.4%	2 256 251	5.7%
Textiles and Clothing	22 522	8.5%	172 068	10.8%	87 852	1.2%	264 374	0.7%
Paper and lumber	1 784	0.7%	11 615	0.7%	48 905	0.7%	2 136 401	5.4%
Chemicals	24 106	9.1%	312 751	19.5%	1 060 953	14.3%	2 892 249	7.3%
Fertilizer	24 500	9.2%	22 825	1.4%	1 496	0.0%	1 426	0.0%
Medicine	3 674	1.4%	17 018	1.1%	268 773	3.6%	438 961	1.1%
Petroleum	42 747	16.1%	41 975	2.6%	569 576	7.7%	802 857	2.0%
Ceramics	10 598	4.0%	15 830	1.0%	95 932	1.3%	533 775	1.3%
Metals	17 725	6.7%	82 371	5.1%	86 847	1.2%	682 757	1.7%
Machinery	21 000	7.9%	98 603	6.2%	471 412	6.4%	1 798 607	4.5%
Electricity and electronics	45 279	17.0%	228 554	14.3%	1 054 010	14.2%	5 510 774	13.9%
Transport equipment	4 250	1.6%	78 197	4.9%	685 621	9.3%	1 729 762	4.3%
Other manufacturing	7 546	2.8%	23 788	1.5%	71 130	1.0%	560 377	1.4%
Services	**32 182**	**12.1%**	**423 060**	**26.4%**	**2 555 601**	**34.5%**	**19 852 041**	**49.9%**
Electricity and gas	-	0.0%	-	0.0%	-	0.0%	817 426	2.1%
Construction	3 680	1.4%	9 800	0.6%	43 269	0.6%	136 640	0.3%
Wholesale and retail	-	0.0%	-	0.0%	60 771	0.8%	2 766 822	7.0%
Trading	42	0.0%	368	0.0%	165 850	2.2%	1 452 253	3.7%
Restaurant	-	0.0%	100	0.0%	22 446	0.3%	131 356	0.3%
Hotel	7 794	2.9%	232 077	14.5%	1 498 718	20.2%	4 587 157	11.5%
Transport and storage	3 904	1.5%	26 611	1.7%	15 955	0.2%	469 571	1.2%
Financing	2 921	1.1%	101 219	6.3%	482 714	6.5%	4 110 310	10.3%
Insurance	-	0.0%	3 009	0.2%	178 475	2.4%	688 887	1.7%
Real estate	-	0.0%	-	0.0%	-	0.0%	63 151	0.2%
Other services	13 841	5.2%	49 876	3.1%	87 403	1.2%	4 628 468	11.6%
Total	**266 031**	**100.0%**	**1 600 074**	**100.0%**	**7 403 723**	**100.0%**	**39 769 666**	**100.0%**

Source: MOCIE (Korea Ministry of Commerce, Industry and Energy).

Republic of Korea has been falling since the mid-1980s. Recently, European investors have increased their investment in the Republic of Korea. The Netherlands, in particular, has sharply increased its direct investment in the Republic of Korea. Among the developing countries, Malaysia has been the largest investor in the Republic of Korea (see table 24).

FDI inflows into the Republic of Korea have been increasing since 1993. Noticeable is the continued increase in 1998, when the Republic of

Table 24. Geographical distribution of inward FDI

(Millions of US$)

	1962 to 1971		1972 to 1981		1982 to 1991		1992 to 1999	
North America	**139 501**	**52.4%**	**419 711**	**26.2%**	**2 130 217**	**28.8%**	**14 075 987**	**35.4%**
United States	120 324	45.2%	370 615	23.2%	2 049 061	27.7%	12 453 172	31.3%
Canada	206	0.1%	935	0.1%	17 566	0.2%	611 143	1.5%
Asia	**104 415**	**39.2%**	**991 194**	**61.9%**	**3 264 503**	**44.1%**	**11 070 758**	**27.8%**
Japan	98 017	36.8%	927 910	58.0%	2 997 894	40.5%	4 067 611	10.2%
China	-	0.0%	-	0.0%	3 590	0.0%	72 020	0.2%
Hong Kong, China	5 773	2.2%	60 663	3.8%	169 210	2.3%	998 142	2.5%
Taiwan Province of China	360	0.1%	360	0.0%	9 737	0.1%	119 370	0.3%
Singapore	-	0.0%	30	0.0%	68 499	0.9%	1 785 796	4.5%
Philippines	-	0.0%	-	0.0%	551	0.0%	3 220	0.0%
Malaysia	-	0.0%	-	0.0%	377	0.0%	3 673 837	9.2%
Indonesia	-	0.0%	-	0.0%	105	0.0%	6 714	0.0%
Thailand	-	0.0%	-	0.0%	-	0.0%	5 270	0.0%
Europe	**20 732**	**7.8%**	**134 086**	**8.4%**	**1 899 350**	**25.7%**	**14 326 980**	**36.0%**
Germany	2 762	1.0%	33 886	2.1%	327 835	4.4%	2 499 066	6.3%
United Kingdom	10 658	4.0%	20 366	1.3%	214 234	2.9%	1 084 274	2.7%
France	450	0.2%	14 381	0.9%	181 317	2.4%	1 790 537	4.5%
Netherlands	6 150	2.3%	27 554	1.7%	768 967	10.4%	6 092 973	15.3%
Switzerland	-	0.0%	31 090	1.9%	286 079	3.9%	546 200	1.4%
Middle East	**405**	**0.2%**	**28 015**	**1.8%**	**12 193**	**0.2%**	**60 018**	**0.2%**
International organizations	**978**	**0.4%**	**27 068**	**1.7%**	**92 460**	**1.2%**	**117 756**	**0.3%**
Others	**-**	**0.0%**	**-**	**0.0%**	**5 000**	**0.1%**	**118 167**	**0.3%**
Total	**266 031**	**100.0%**	**1 600 074**	**100.0%**	**7 403 723**	**100.0%**	**39 769 666**	**100.0%**

Source: MOCIE (Ministry of Commerce, Industry and Energy).

Korea was in the midst of the financial crisis and an extreme recession. This can be attributed to various factors: a fall in asset prices, a greater number of firms seeking foreign capital, liberalization of mergers and acquisitions and the Government's deregulation and promotional efforts. Whether this upward trend continues depends mostly on foreign investors' assessment of market prospects. FDI inflows into the Republic of Korea are likely to be on the upward trend as long as the Republic of Korea recovers its market and upgrades its technological infrastructure, knowledge and human resources.

2. Overseas direct investment by the Republic of Korea

At the end of the 1980s, the Republic of Korea's overseas direct investment increased rapidly as it had been achieving surpluses in the balance of payments owing to the three low-cost factors: oil prices, exchange rates and interest rates. The Republic of Korea's overseas direct investment continued to rise in the 1990s and in 1996, one year before the financial crisis, investment peaked, reaching US$ 4.25 billion. However, with the eruption of the financial crisis in 1997, the level of

investment began to decline drastically. A clear downward trend in the number and total amount of investments throughout 1997-1999 was evident and, in particular, investments decreased to US$ 2.55 billion in 1999. Coming into 2000, the level of investment still remained at a similar level as in the previous year. Republic of Korea companies, facing pressure to restructure, are reducing the scale of overseas direct investment.

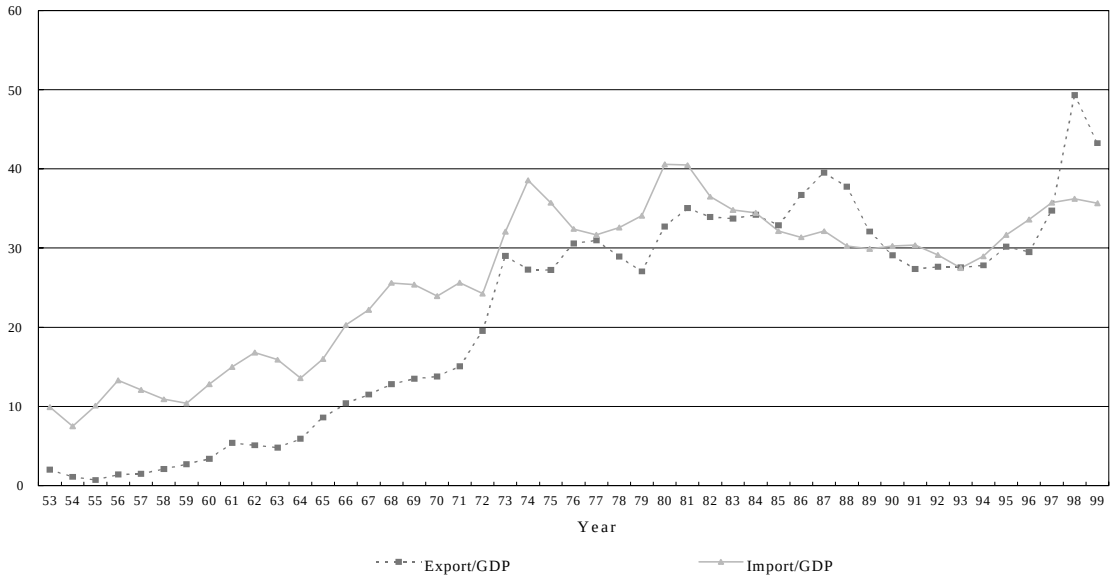
Table 25 shows the annual trends in the Republic of Korea's overseas direct investment. The overseas direct investment since the financial crisis showed an interesting pattern. In 1998, the number of investment projects declined to 583, only half the number in 1997, while the amount of investment increased from US$ 3.2 billion to US$ 3.9 billion. However, in 1999, the number of investment projects recovered back to 1,023, slightly less than in 1997, while the amount of investment decreased sharply to US$ 2.5 billion. The increase in the absolute amount of investment in 1998 might be partly due to the increase in the substantial amount of additional investment by parent companies in their foreign subsidiaries. As the Republic of Korea's national credit rating deteriorated, overseas subsidiaries were unable to roll over their short-term borrowings or to acquire new funds in the local financial markets. Consequently, the parent companies were forced to increase investments in the form of capital increases. The drastic decline in the total amount of investments in 1999 to US$ 2,550 million resulted from a decrease in new investments and a reduction in additional investment by parent companies in foreign subsidiaries.

Table 25. Republic of Korea's overseas direct investment by year

(Millions of US$)

	Approved		Invested	
	Cases	**Amount**	**Cases**	**Amount**
1968-1980	400	250.7	352	145.2
1981	64	108.5	49	28.2
1982	54	121.4	49	100.8
1983	67	83.0	56	108.9
1984	49	67.4	46	50.2
1985	43	219.1	38	112.8
1986	73	363.8	50	182.7
1987	109	367.4	91	409.7
1988	249	4 748.0	171	215.9
1989	368	943.7	269	569.6
1990	515	1 610.9	341	958.9
1991	527	1 524.2	445	1 115.4
1992	632	1 348.8	497	1 219.4
1993	1 051	1 876.5	682	1 261.8
1994	1 948	3 581.9	1 485	2 299.6
1995	1 569	4 950.5	1 309	3 071.8
1996	1 809	6 290.4	1 452	4 248.5
1997	1 600	5 829.4	1 299	3 229.6
1998	702	5 132.7	583	3 895.1
1999	1 220	4 538.6	1 023	2 549.1
Total	**13 049**	**39 576.4**	**10 287**	**25 770.4**

Figure 16. The Republic of Korea's exports and imports as a share of GDP



Source: Bank of Korea, National Accounts, various issues.

D. Trade and regional integration

1. The Republic of Korea's trade in the 1990s

Trade has played a leading role in the Republic of Korea's economic development. Exports and imports as a share of GDP increased continuously from the 1950s to the 1970s. Thereafter, the imports-to-GDP ratio started to decrease in the early 1980s and the exports-to-GDP ratio started to decrease in the late 1980s (excluding the irregular movement since the Asian financial crisis).

Diversification of trading partners has been emphasized since the 1980s, during which time the Republic of Korea and the United States were going through rough trade relations. Since the 1980s, whether through design or circumstance, the distribution of the Republic of Korea trade has diversified. Before the Asian crisis, more than 50 per cent of the Republic of Korea's exports went to other Asian countries, and more than 15 per cent to ASEAN countries. In 1999, the share of Asian countries decreased slightly, but still 42.1 per cent of Republic of Korea's exports were to Asia, and 10.2 per cent to ASEAN countries. The expanding geographical distribution may imply that Republic of Korea firms are engaged in more global strategies, diversifying their markets. But it may also imply that Republic of Korea companies are losing market shares in American markets.

We also see in table 26 that the geographical distribution of Republic of Korea imports has diversified as well, though not as much as exports. However, as seen in table 27, the United States continues to be one of the Republic of Korea's two largest trading partners.

On the import side, imports from all major regions rose as well, although some regions did much better than others. Imports from the United States rose significantly. After falling by 32.3 per cent in 1998, imports from the United States rose by 22.1 per cent in 1999. Imports from Japan made a similar recovery, from a fall of 39.7 per cent in 1998 to a gain of 43.4 per cent in 1999. Imports from the European Union have not yet made a similar recovery, falling by 42.4 per cent in 1998, but rising by only 15.6 per cent in 1999.

Table 26. Geographical distribution of the Republic of Korea's trade

(Millions of US$)

Exports

	1990	1996	1997	1998	1999
Total exports	65 016	129 715	136 164	132 313	143 685
Asia	24 639	65 744	68 530	57 539	65 833
Japan	12 638	15 767	14 771	12 238	15 862
China	585	11 377	13 572	11 944	13 685
ASEAN	5 217	20 311	20 365	15 328	17 708
Middle East	2 619	5 718	5 104	6 586	6 398
Europe	12 001	21 395	24 817	28 749	26 091
European Union	10 003	15 325	16 864	18 171	20 241
Eastern Europe	509	4 135	4 138	3 207	2 436
North America	21 091	22 874	23 140	24 356	31 113
United States	19 360	21 670	21 625	22 805	29 475
Latin America	2 102	8 961	8 668	8 867	8 645
Africa	892	2 250	3 049	2 821	2 347
Oceania	1 214	2 433	2 685	3 222	3 601
Industrialized economies	45 299	57 288	60 034	63 721	72 792
Developing economies	19 717	72 427	76 130	68 592	70 894

Imports

	1990	1996	1997	1998	1999
Total imports	69 844	150 339	144 616	93 282	119 752
Asia	28 515	57 602	55 544	35 691	50 439
Japan	18 574	31 449	27 907	16 840	24 142
China	2 268	8 539	10 117	6 484	8 867
ASEAN	5 122	12 074	12 549	9 135	12 249
Middle East	6 188	15 080	17 279	11 417	14 695
Europe	10 501	26 244	23 688	14 281	16 579
European Union	9 066	21 204	18 983	10 928	12 629
Eastern Europe	202	2 347	2 025	1 405	2 091
North America	18 408	36 029	32 726	22 378	26 715
United States	16 942	33 305	30 122	20 403	24 922
Latin America	1 725	4 392	4 076	2 197	2 865
Africa	363	2 521	4 442	1 977	2 944
Oceania	3 201	7 404	6 846	5 302	5 486
Industrialized economies	49 760	98 666	89 436	57 538	71 022
Developing economies	20 084	51 673	55 180	35 743	48 731

Source: KOTIS database based on Republic of Korea customs clearance figures.

Table 27. Republic of Korea's top five import partners

	1990	(%)	1995	(%)	1996	(%)	1997	(%)	1998	(%)	1999	(%)
1	Japan	26.6	Japan	24.1	United States	22.2	United States	20.8	United States	21.9	United States	20.8
2	United States	24.3	United States	22.5	Japan	20.9	Japan	19.3	Japan	18.1	Japan	20.2
3	(European Union)	12.1	(European Union)	13.5	(European Union)	14.1	(European Union)	13.1	(European Union)	11.7	(European Union)	10.5
4	Germany	4.7	China	5.5	China	5.7	China	7.0	China	7.0	China	7.4
5	Australia	3.7	Germany	4.9	Germany	4.8	Saudi Arabia	4.9	Australia	4.9	Saudi Arabia	4.7
6	China	3.2	Saudi Arabia	4.0	Saudi Arabia	4.4	Australia	4.1	Saudi Arabia	4.7	Australia	3.9

Note: (European Union) signifies what position the European Union would be in, and its share of total Republic of Korea imports, if the European Union was considered as one entity.

Imports from the Asian region, including the ASEAN countries, have recovered as well. Imports from the Asian region rose by 41.3 per cent in 1999, recovering from a fall of 35.7 per cent in 1998. Imports from ASEAN, in particular, rose by 34.1 per cent in 1999, after falling by 27.2 per cent in 1998. Thus, imports from the United States, Japan and the Asian region have recovered to a level slightly below the 1997 levels. Imports from the European Union and Oceania have not yet made a similar recovery.

As seen in tables 26 and 27, the Republic of Korea's largest trade partner, for both exports and imports, remains the United States. The United States took 20.5 per cent of total exports from the Republic of Korea and supplied 20.8 per cent of the imports in 1999. The European Union, taken collectively, was the Republic of Korea's second largest export partner, and Japan was third, followed by China; Hong Kong, China; and Taiwan Province of China. On the import side, Japan was the second largest player, followed by the European Union, China, Saudi Arabia and Australia.

2. Increasing importance of East Asian markets

The rapid rise in wage levels in the Republic of Korea since 1987 forced large companies to expand outsourcing through subcontracting with SMEs whose wage levels were relatively low. The large companies and SMEs alike then further expanded the production network abroad. Many production activities in such industries as footwear, textiles and toys shifted to other developing countries. Consequently, firms in Asian countries are not just competitors to Republic of Korea

companies but also partners for cooperation.

Asian developing countries are growing faster than the global economy as a whole. The weighted average growth rate of Asia was 8.2 per cent in 1996 and 3.8 per cent in 1998 after the crisis, while that of the world was 4.3 per cent in 1996 and 2.5 per cent in 1998. The region encompasses the most dynamic economies in the world today. In particularly, the East Asian developing countries – including NIEs (Republic of Korea; Taiwan Province of China; Hong Kong, China; and Singapore), ASEAN (Thailand, Malaysia, Indonesia, Singapore, Philippines) and China – grew faster than any other area in the world until the Asian crisis. The East Asian region is one of the most attractive markets in the world.

East Asian markets are becoming increasingly important for Republic of Korea exporters. The ratio of Republic of Korea exports to East Asian developing countries to the total exports of the Republic of Korea increased from 10.8 per cent in 1985 to 34.6 per cent in 1996 and was 30.3 per cent in 1998. This phenomenon is not unique to the Republic of Korea. Exports from Japan and the United States to this region are also rapidly increasing. The share of the East Asian market in Japanese exports increased from 24.0 per cent in 1985 to 42.4 per cent in 1996. The East Asian market took 11.9 per cent of total exports from the United States in 1985 and the ratio increased to 18.1 per cent in 1996. In 1998, after the Asian crisis, the share of East Asian markets in United States and Japanese exports decreased sharply. Since East Asian developing countries are growing rapidly and pursuing an outward-oriented development strategy, these countries are trading more and more extensively with each other. The share of intraregional exports in East Asian developing countries increased from 20.6 per cent in 1980 to 36.7 per cent in 1996.

Foreign direct investment (FDI) statistics also show a similar pattern. The major portion of the foreign direct investment inflow into East Asia also originated from the same region (see table 28). In 1996, 46.8 per cent of the foreign direct investment inflow into eight East Asian developing countries – Republic of Korea; Taiwan Province of China; Hong Kong, China; Thailand; Malaysia; Philippines; Indonesia and China – was generated among themselves, while 21.1 per cent was from Japan. In particular, Hong Kong, China accounted for 49.6 per cent of FDI in China, and NIEs accounted for 28.4 per cent of FDI in the ASEAN-4 (Thailand, Malaysia, Philippines, Indonesia). Neighbouring countries seem to be more capable of reducing "foreign costs" of FDI and penetrating the markets in this region.

FDI contributed significantly to the self-generating growth mechanism in East Asia. Japan first invested in the NIEs and then in South-East Asia to produce labour-intensive or land-intensive products. Subsequently, the NIEs themselves became major investors in the region. Japan and the NIEs export materials and equipment to the host economies for FDI. These host economies, in turn, export the finished products to third countries, particularly the United States.

The restructuring process in Japan shows an example of reciprocity among Asian countries. In response to the strong yen and rising domestic costs, Japanese companies shifted production abroad. Japan expanded the international division of labour particularly with other East Asian countries. The annual growth rate of Japanese FDI in East Asian developing countries was 28.5 per cent between 1985 and 1993, while that of total Japanese FDI outflow was 20.2 per cent during the same period. The enhanced competitiveness of the companies in East Asia brought cost savings for Japanese companies, while the Japanese investment contributed to the economic development in the region.

Table 28. Intraregional foreign direct investment in Asia: 1996

(Percentage)

Host countries / Source countries	Asian NIEs	ASEAN-4	China	East Asia
Asian NIEs	7.5	28.4	66.5	42.0
Republic of Korea	0.5	4.7	3.3	3.7
Taiwan Province of China	0.0	7.1	8.3	6.9
Hong Kong, China	4.7	3.1	49.6	22.2
Singapore	2.2	13.6	5.4	9.2
ASEAN-4	7.0	6.3	2.2	4.7
Thailand	0.0	3.2	0.8	1.9
Malaysia	7.0	2.9	1.1	2.6
Philippines	0.0	0.0	0.1	0.1
Indonesia	0.0	0.2	0.2	0.2
China	0.1	0.2		0.1
East Asia	14.6	35	68.7	46.8
United States	30.4	9.0	8.3	10.7
Japan	22.5	31.0	8.8	21.1
Europe	20.1	15.1	6.6	12.1
World total	**100.0**	**100.0**	**100.0**	**100.0**

Source: *JETRO, JETRO White Paper: Foreign Direct Investment of World and Japan*, various years.

Notes: 1 Asian NIEs includes three countries: Republic of Korea; Taiwan Province of China; and Hong Kong, China.

2 ASEAN-4 includes Thailand, Malaysia, the Philippines and Indonesia.

3 East Asia includes eight Asian NIEs countries, the ASEAN-4 and China.

The Republic of Korea's firms, facing increasing wage levels, have attempted to reform their business structure by increasing overseas production sites in East Asia and in other regions. The East Asian developing countries accounted for 41.4 per cent of Republic of Korea FDI outflow in 1994. In the same year, China accounted for 30.9 per cent of Republic of Korea FDI outflow. The deepening international division of labour with East Asian developing countries reflects the process of industrial restructuring in the Republic of Korea.

Increasing intraregional trade and investment further induced the complementarity of industrial structures in this region. In addition, countries in this region share similar development experiences, a high growth rate and geographical proximity to each other. East Asian developing countries are not only becoming attractive marketplaces for each other but are also becoming important partners for industrial cooperation.

E. Conclusion

To expand and deepen networks of innovation, Republic of Korea firms are collaborating among themselves as well as with leading companies in the world. Accumulating core competencies in the knowledge- intensive sector is one way for the Republic of Korea to achieve further economic development. The other side of the story

is to keep being active in world trade and to expand and deepen its production network with other countries. The dynamic economies in Asia are providing both opportunities and challenges for the Republic of Korea to do so. Republic of Korea firms are actively participating in the international division of labour with other firms in the world. At the same time, they are striving to weave their way into the core of global innovation networks by engaging in strategic alliances with technologically leading companies around the world.

The future goal of Republic of Korea industrial policy should be to provide an institutional framework to promote successful restructuring and a globally harmonious industrial structure. To achieve this goal, the Government has been trying to establish a system of institutions which induces fair competition in markets, facilitates international industrial cooperation and provides assistance for self-help in declining sectors.

VI. INTEGRATION OF INDUSTRIAL ACTIVITIES AT THE REGIONAL AND GLOBAL LEVELS: THE EXPERIENCE OF THE PHILIPPINES

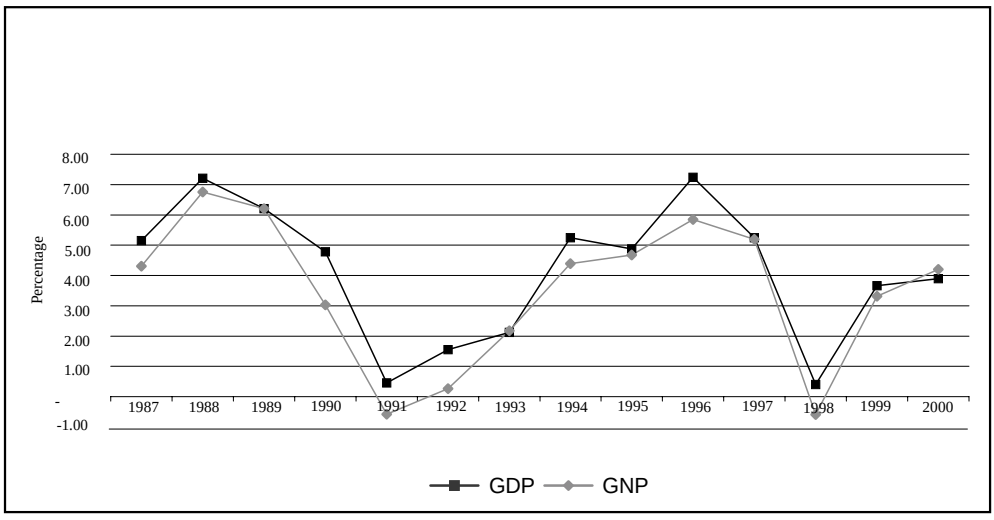
Florina A. Vistal [53]

A. Overview of economic development of the Philippines

Over the past 15 years, the Philippines has painstakingly pursued structural reforms aimed at gradually freeing the economy from ineffective government intervention and a system of protection which engendered inefficiency in the production and distribution of goods and services. The development path of the Philippines over the past years was characterized by a "boom-bust cycle" as its macroeconomic fundamentals took years to improve while its structural foundations were not yet resilient when faced with internal and external shocks.

The macroeconomic performance of the Philippines improved in 1987 after its return to democracy. This growth was characterized by a "consumption-led" recovery as the Government embarked on pump-priming activities to spur economic growth and take advantage of unused capacity. The period 1987-1989 generally showed a respectable performance in all sectors of the economy. However, by late 1989, the economy experienced macroeconomic imbalances largely owing to a current account deficit and public sector deficit. GNP fell to less than 1 per cent in 1991, triggered by a balance-of-payments crisis traced to a large public-sector deficit. The following period saw recovery as the public-sector deficit was

Figure 17. Growth of GDP and GNP (1987-2000)



[53] Director, Board of Investment, Department of Trade and Industry, Manila.

trimmed to a manageable level. Gradually, GNP accelerated and reached 5.85 per cent in 1996. However, this pattern was interrupted by the drought that hit the agricultural sector and the Asian crisis which saw the depreciation of the peso against the US dollar by as much as 48 per cent by the end of 1998. Fortunately, the years of restructuring prevented the domestic financial sector from falling as much as other crisis-affected Asian economies. Notwithstanding the shocks that affected the economy, particularly the Mindanao conflict and the oil price increase, the economy continued to post strong growth in 2000.

Investments grew in a climate of political and economic stability encouraged by economic reforms liberalizing the investment regime and the deregulation of critical sectors. Investment activities, however, took a downturn amid the Asian financial crisis. While there is a seeming declining trend in FDI brought about by the recent internal political crisis, FDI inflows into export-oriented activities in the economic zones exhibits a clear upward inclination.

Investment approvals by BOI also revealed a shift in sectoral investments. In 1987, the manufacturing sector covered the largest share in total BOI-approved projects at P 8,851 million. Gradually, the bulk of investments shifted from the manufacturing sector to the infrastructure and industrial services sector. This became very apparent in 1996, when infrastructure projects registered P 268,928 million in total project cost. In 1997, the public utilities sector also exhibited respectable performance as it gained momentum with infrastructure projects. Growth has been investment- and export-led. Exports grew robustly at double-digit rates. This performance has been fuelled by the growth of electronics and semiconductors, which sector increased its share in total exports from an estimated 30 per cent in the early 1990s to 70 per cent in the year 2000. Despite the crisis that severed most Asian economies, the Philippines has exhibited moderate growth in exports since 1995, hitting a high of US$ 3,496 million in 2000. Imports, however, saw a progressive trend from 1995 hitting a high of US$ 3,413.8 million in 1997. The period that followed was characterized by an erroneous trend in imports.

The changing face of the Philippines exhibited the shift from traditional agro-based products to non-traditional manufactured products.

Figure 18. Total approved foreign direct investments by promotion agencies (1996 – third quater 2000)

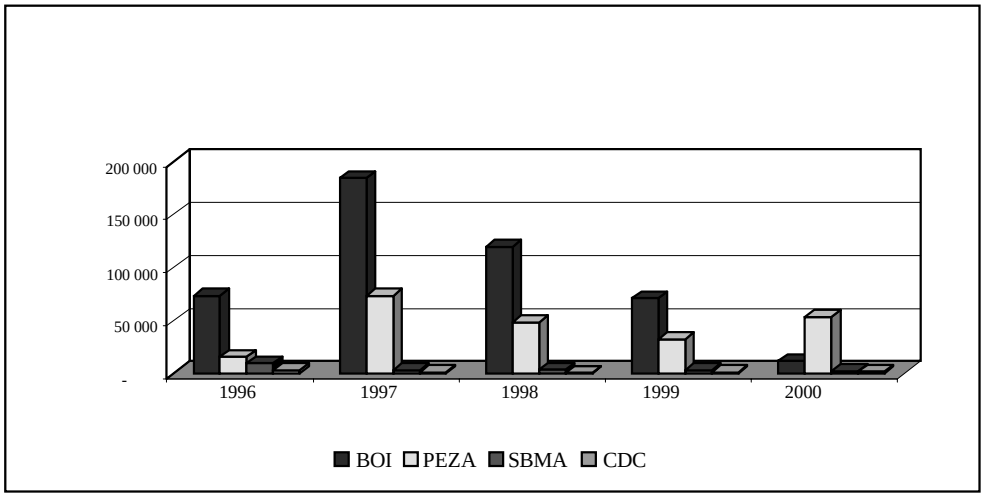
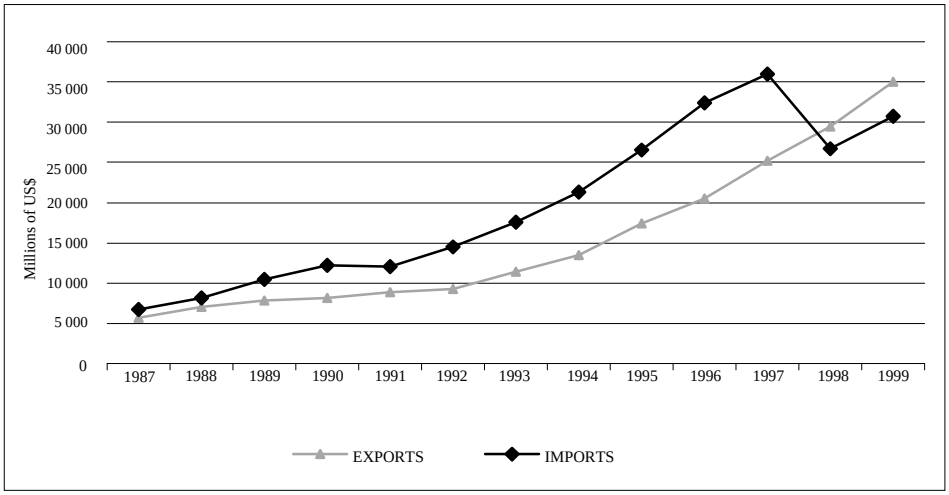


Figure 19. Foreign trade (January 1987-December 1999)



In 1976, agro-based products accounted for 49 per cent of total Philippine exports. In 1999, electronics exports accounted for 79 per cent of total Philippine exports.

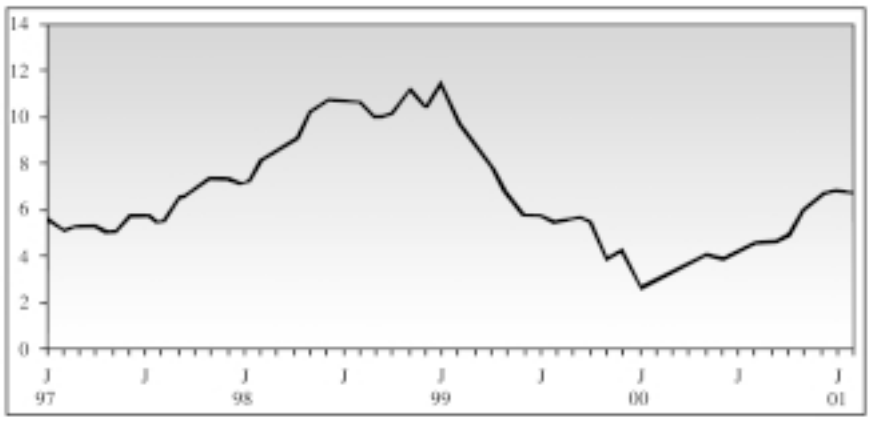
Inflation rates remained below programmed levels in 2000. This can be traced to the deceleration in inflation rates for the food and services sector. In part, this mitigated the inflationary pressures coming from the series of oil price increases in the first half of the year. The latest figure shows a decelerating rate at 6.7 per cent, which is due to the slowdown in inflation for food, beverages and tobacco.

The Philippines has also managed to stabilize interest rates after hitting an all-time high of 33.9 per cent in 1997-1998 because of the Asian financial crisis. Tame inflationary pressures, a calm foreign exchange market and the reduction in the reserve requirements contributed to the decline in interest rates. This low interest rate environment has led to a rise in bank lending activity at comfortable and manageable levels, allowing the corporate sector to take over the gearshift of growth. The latest figure shows that the interest rate averaged 14.0 per cent in 2000.

The Philippines was among the first countries to recover from the Asian financial crisis. While the peso-dollar rate has been mostly stable for the past three years, several episodes of volatility were experienced by mid-2000. Behind the recent depreciation of the peso is the rise in United States interest rates since mid-1999 and the overall weakening of regional currencies. On the internal side, the volatility of the peso was accompanied by increased corporate activity, which translated into higher demand for dollars.

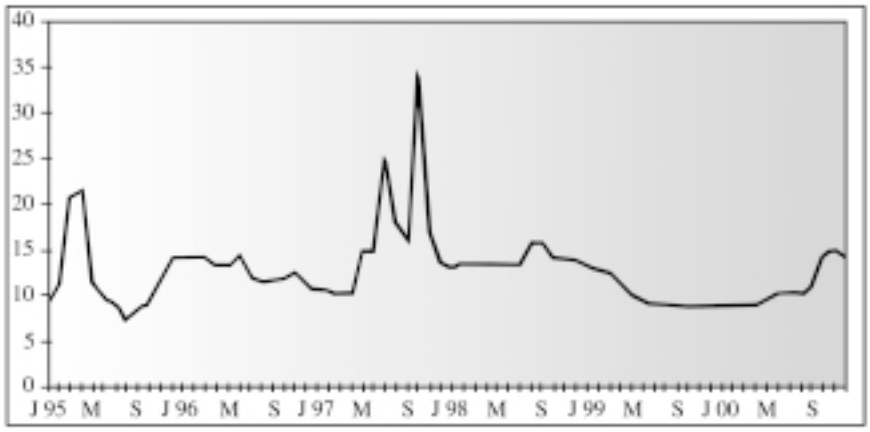
On the capital-market side, stock trading activity slackened as the composite index breached the support level of 2000 index points in 2000. This is comparatively lower than the previous year's upbeat mood, when the composite index averaged 2,171.6 index points. The PSE composite index generally exhibited a declining trend, which may be attributed to the rise in United States interest rates and the subsequent slowdown in United States stock markets. Domestic factors such as the Mindanao conflict and oil price increases also contributed to the decline. However, the market valuation of stocks indicates a boost in the capital market with the structural reforms recently undertaken by the Government.

Figure 20. Inflation rate (January 1997-February 2001)
(Percentage)



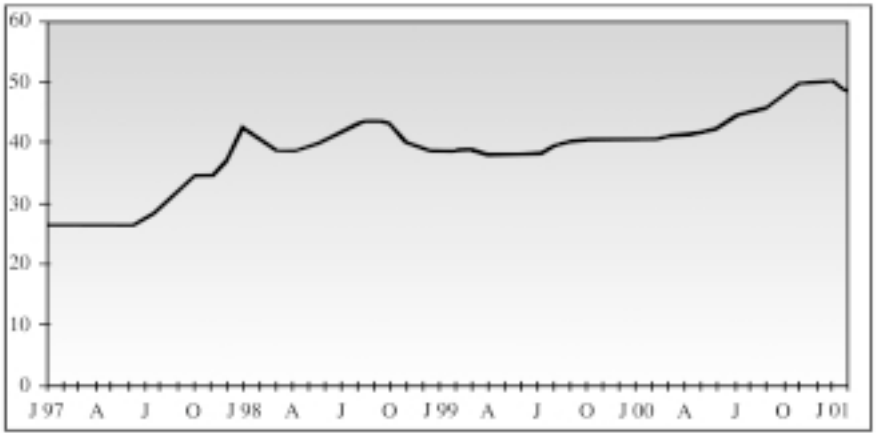
Source: National Statistics Office (NSO), Philippines.

Figure 21. Interbank call loan rates (January 1995-December 2000)
(Percentage)



Source: Bangko Sentral ng Pilipinas (BSP).

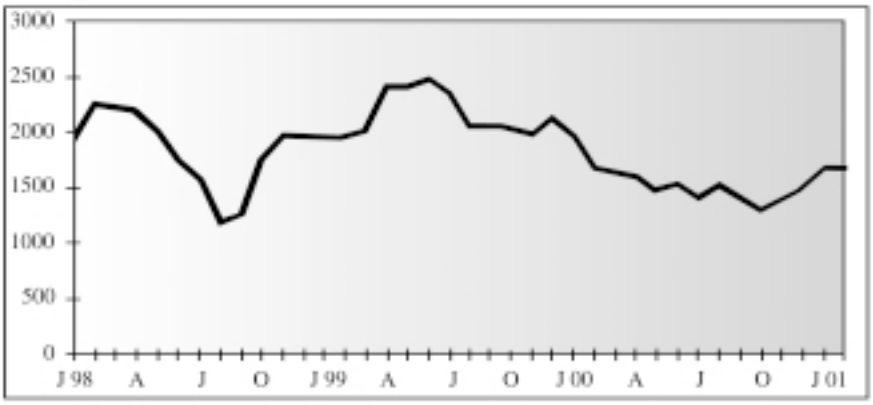
Figure 22. Monthly peso per US dollar rate (January 1996-February 2001)



Source: Philippine Dealing System.

Note: Rates are weighted interbank average rates for each month.

Figure 23. PSE composite index (January 1998-February 2001)



Source of basic data: Philippine Stock Exchange (PSE) at <*www.pse.org.ph*>.

Overall, the continued resilience of the Philippine economy in the face of internal and external shocks attests to its sound economic fundamentals. Close observers of the Philippines are apt to see an economy gearing up for faster growth and characterized by sound macroeconomic fundamentals backed by a supportive economic environment and a strong financial sector. The development points of the Philippines exhibit a momentum geared towards a higher growth path and a sustained integration into the new global economy.

B. Structural reforms in the Philippines

In the mid-1980s, the Government unilaterally embarked on structural reforms that would gradually free the economy from inefficiencies and provide machinery that would allow the efficient use of all the factors available to the economy. These structural reforms included privatization, tax reform, financial sector reform and the liberalization and deregulation of certain industries. These reforms dismantled cartels, monopolies and other forms of "crony capitalism" left over from the decades of protectionism and import substitutions. This is also the major reason why the Philippine economy was able to withstand the worst of the Asian financial crisis that hit the region in the middle of 1997.

To complement these structural reforms and to further place the Philippine economy within the standards of other developing countries, the Government enacted laws that covered the gradual realignment of tariff rates and investment laws that eased the barriers to international trade and foreign investments.

The Philippines began a phased realignment of tariff rates in 1990 and the deregulation of imports in 1992. A second restructuring of tariff rates was introduced in 1995. Tariff reductions were instituted for non-sensitive agricultural products and a timetable for the tariffication of quantitative restrictions in sensitive agricultural products was also formulated in 1995. These tariff simplification and reduction measures resulted to a five-tier tariff schedule in the10-50 per cent range in 1995 and a three-tier schedule in the 3-20 per cent range in 2000. By the year 2004, the Government intends to adopt a uniform tariff rate of 5 per cent.

The Government has also been cognizant of the potential of domestic and foreign investments to spur economic growth. Thus, it institutionalized a policy framework that improved the overall investment climate and eliminated discrimination against any investment source.

Major structural reforms	
Privatization	The first wave of privatization involved the restoration of certain acquired assets to the private sector and the privatization of essentially private activities undertaken by government entities (hotels, banks, an airline company, steel firm, mining companies, petroleum refinery, copper smelting and refinery company). The Philippines is now in the second and third waves of its privatization efforts. The second wave has been done through Build-Operate-Transfer (BOT) schemes (primarily the provision of energy, construction of roads and other infrastructure facilities). The third wave will cover the social sectors such as health services, education and pension funds.
Tax reform	A major restructuring of the tax system has been undertaken with the enactment of RA 8424 (Tax Reform Act of 1997). This was aimed at rationalizing the internal revenue system to create an environment conducive to business and to enable firms to compete better in the regional as well as the global market. This was also aimed at restructuring the tax rates to a more reasonable level and at establishing a mechanism that would facilitate tax administration.
Financial-sector reform	Key reforms in the financial sector include the deregulation of the foreign exchange market, opening of the capital account and encouragement of foreign currency deposit units. In 1994, the entry of foreign banks was liberalized under RA 7721. In 2000, an increase in foreign ownership of a local bank from 30-40 per cent of the voting stock up to a maximum of 100 per cent became allowable under the General Banking Law. Non-bank financial intermediaries were also liberalized with the deregulation of the insurance industry in 1994 and the passage of RA 8366 (Investment Houses Law) in 1997. The latter increased foreign equity participation up to 60 per cent of the voting stock of an investment house and allowed foreign nationals to become members of the Board of Directors to the extent of their participation in the equity of the enterprise. On the capital-market side, significant reforms include the establishment of the Bureau of Treasury, which regularized the issuance of treasury bills and long-term government bonds; and the passage of the Securities Act, which defined the powers of the Securities and Exchange Commission and integrated the Manila and Makati Stock Exchanges. In July 2000, the Revised Securities Act was enacted, which mandated the reorganization of the Securities and Exchange Commission (SEC) into an effective market regulator and adopted a full disclosure approach to securities market regulations.

Major structural reforms *(continued)*	
Deregulation in major industries	*Petroleum trade* RA 8749 (Downstream Oil Industry Deregulation Act of 1998) provided for the deregulation of downstream activities such as the import, export, manufacturing, marketing and distribution of petroleum products. *Shipping industry* Liberalization and deregulation of the shipping industry demonopolized and expanded shipping services, thereby increasing the entry of new players, improving the level of services and lowering rates. *Aviation industry* In 1995, the aviation industry was liberalized, which opened new routes and gave birth to new domestic airlines that now service routes once dominated or monopolized by Philippine Airlines. *Telecommunications* The liberalization of the telecommunications sector aimed to accelerate the development of the country's telecommunications infrastructure through increased private-sector participation. Thus, compulsory interconnection among carriers was mandated and the provision of local exchange service improved.

The following laws have further created excellent opportunities for investment:

1. The Regional Headquarters Law, which provides further incentives for multinational corporations wanting to set up their regional headquarters in the Philippines.
2. The Retail Trade Liberalization Act, which allows foreign firms (with paid-up capital of US$ 2.5 million to US$ 7.5 million) 100 per cent ownership in the retail-trade sector, except for the first two years, where foreign participation shall be limited to not more than 60 per cent.
3. The E-Commerce Act, which defines the legal and regulatory parameters of online commercial transactions while punishing computer hacking and other electronics-related electronic piracy. The Act will strengthen the Philippines' capability to capture a major share of the multibillion dollar information technology industry.
4. The Amended Banking Law (RA 8791), which is now up for enforcement by the BSP, with a special committee for this purpose. It is noteworthy that the general banking law allows foreign banks to acquire up to 100 per cent of the voting stock of an existing bank within seven years.

Still pending are the following key measures:

1. The Omnibus Power Bill, which will privatize the operations of the State-owned power company, the National Power Corporation (NAPOCOR). The Bill proposes to restructure the power industry by promoting competition in electric power generation and supply. This will, in turn, lower power rates and thus reduce the costs of operating a business in the Philippines.
2. Amendments to the new Central Bank Act, which will enhance the Bangko Sentral ng Pilipinas' supervisory and enforcement

Investment policy	
Investment policy	Salient features
EO 226 (Omnibus Investments Code of 1987)	This provided the rules by which foreign investments may benefit from incentives.
RA 7042, as amended by RA 8179 (Foreign Investments Act of 1991)	This governs the entry of foreign investments without incentives, liberalizes the minimum paid in capital requirements for foreign investments in domestic-market enterprises and opens selected activities to natural-born Filipinos who have acquired foreign citizenship.
RA 8756 (Regional Headquarters Law)	This expanded the scope of permissible activities and provided further incentives for multinational corporations wanting to set up their regional headquarters in the Philippines
EO 11 (approving the Third Regular Foreign Investment Negative List)	This prescribed the extent of foreign ownership in certain sectors. Domestic-market enterprises with paid-up capital equity of US$ 200,000 and engaged in activities not covered under the negative list can be 100 per cent foreign-owned. For an export enterprise, there are no restrictions on the extent of foreign ownership unless the activity falls within the negative list. This further delists private construction contracts from the negative list, thus allowing up to 100 per cent foreign equity participation therein.
RA 7227 (Bases Conversion Development Act of 1992)	This provides incentives to enterprises located within the Subic Bay Freeport Zone, the Clark Special Economic Zone and their extensions.
RA 7916 (Special Economic Zone Act of 1995)	This provides incentives to enterprises located within special economic zones.
RA 7844 (Export Development Act of 1994)	This provides incentives to enterprises in the export business.

powers and further improve prudential standards for the banking system, intensify competition in the banking sector and enhance the BSP's independence.

To ensure that international fair trade is being practised and local producers are not subjected to unfair trade practices, the Safeguard Measures Act and the Anti-Dumping Act have been put in place/ strengthened. Philippine national product standards aligned with international standards are being established to improve the competitiveness of Philippine manufacturers while preventing the dumping of cheap, substandard articles into the

country. Discussions on competition policy have also been progressing.

Other factors that are instrumental in industrial development in the Philippines include the adoption of industry development programmes, the achievement of industrial peace and the implementation of S&T support programmes for various industries. Reduction of the costs of doing business continues to be a priority agenda item through the streamlining and computerization of key government-to-business (G2B) transactions. The reform of the human resources sector through productivity enhancement and skills-upgrading programmes, including the review of the educational system/curriculum to match industry requirements, is a continuing concern. As industries face globalization, the improvement of the support infrastructure has to be fast tracked through the BOT scheme, deregulation/unbundling of power services and the provision of industrial estates and economic zones to host industrial activities spurred by the growth in investments and to sustain export competitiveness. The integration of the SME sector into the global economic system and improving SME linkages with large firms continue to be hampered by SMEs' lack of access to capital, technology, markets and entrepreneurial development. The strengthening of the linkages between and among agriculture, industry and services to improve value addition and to establish a broader industrial base is likewise an important part of the industry development programme.

To strengthen collaboration between and among the Government, private sector and civil society in planning and policy formulation in the face of increasingly complex concerns brought about by the changing business environment, the Trade and Industry Development Council was formed to institutionalize and strengthen the consultative/participatory process.

C. Participation in multilateral trading arrangements

The Philippines has been very active in pursuing regional and multilateral arrangements to take advantage of the benefits that can be derived from operating in a free trade environment.

The Philippine commitments relating to trade liberalization such as tariff reduction, removal of non-tariff barriers and progressive liberalization are always made in consultation with Philippine industry. This approach has proved effective in encouraging Philippine industry take big steps in accessing export markets by linking with MNCs or venturing into various cooperative arrangements. Philippine participation in the AFTA/CEPT, APEC and WTO initiatives have provided manufacturers with improved economies of scale in production to produce cost-competitive quality products. Although this has led to a number of joint-venture activities as well as new foreign investments, small-scale companies that cannot afford to utilize new technologies or upgrade existing operations were displaced by better-quality products entering the Philippine market at a competitive cost.

D. Impact of trade liberalization in selected industries

As is always the case in countries coping with the demands of globalization, some sectors will be more threatened and complain of the rapid pace of liberalization and deregulation pursued by the Government. An example is the motor vehicle industry, which is characterized by a domestic-oriented assembly operation and export-oriented parts manufacturing sector. Over the past decades, it has been part of the Philippine Government's liberalization programme in terms of tariffs, import liberalization, development programmes, and other related investment enhancement measures. The implementation of localization programmes

promoted "big brother-small brother" development schemes, thus integrating SMEs into the industry. From an inward-looking or closed market in the early 1970s, the industry gradually opened up while trying to cope up with all its domestic frailties as it took advantage of the different market linkages in the region, such as the Brand-to-Brand Complementation (BBC) Scheme, the ASEAN Industrial Joint Venture (AIJV), the ASEAN Industrial Cooperation (AICO) scheme and its inclusion in the Common Effective Preferential Tariff. These regional industrial cooperation programmes, which provided an expanded ASEAN market, became an attractive incentive for the industry to rationalize its operations as it capitalized on its niche products and firmly established complementation among the assemblers' major partners as tariff barriers still generally remain high in the region. The existing AICO scheme remains attractive to the automotive assemblers as they move from parts complementation to production for niche markets. It is noted, however, that the procedure has to be further simplified to make access to the programme easier. The participants are likewise mostly MNCs and there is a need to further facilitate the participation of SMEs in the programme to make regional integration more meaningful or, at the very least, facilitate their survival in a liberalized environment.

As the Government pursued its liberalization process, the elements of the market changed with the Asian financial crisis as consumer buying power eroded, leading to a drastic decrease in domestic sales, and the cost of doing business became prohibitive. This condition was not anticipated in the country's earlier stages of liberalization, which were implemented on the assumption of continuous market growth and with reasonable cost increases to support a viable manufacturing operation in a market-driven business environment. The industry on its own implemented restructuring programmes with moves on mergers, consolidations and strategic alliances. In recognition of the industry's capability to become competitive, the Government with its partnership with the industry association has also embarked on a number of capacity-building programmes in preparation for the full deregulation of the industry. The industry is currently working out assistance programmes through a unique network of assemblers, parts makers, industry associations and other international institutions/forums to address industry gaps. Automotive parts exports continue to grow, led by the performance of competitive MNC affiliates or joint ventures.

Given the new economic realities as a result of globalization, the Philippine Government has been implementing a number of programmes to maintain its export and industry competitiveness and to fast-track investments. It has updated its export development plan, taking into account the present world market scenario. One particular industry being pushed in the export market is electronics. Players in this industry are mostly MNCs. The industry now accounts for 70 per cent of the country's total exports. The electronics industry, which had an export orientation from the start, focuses on achieving and maintaining manufacturing excellence to survive in the global market. It is customer-driven and the quality and reliability of the products is but a minimum requirement. Through regular consultation with industry associations, a number of critical issues and concerns are being addressed to provide the necessary business environment for sustained growth. The increase in the industry's value added continues to be a major thrust as reverse trade fairs are promoted and the entry of investments in the supporting industry is encouraged.

E. Policy response for a knowledge-based industry

Reputable market analysts project that the market for IT-enabled services and e-commerce

worldwide is expected to be valued at billions of dollars, with Internet users growing tenfold every five years. Andersen Consulting estimates that global e-commerce reached US$ 150 billion in 1999 and is expected to grow to US$ 700 billion in the next five years, with 80 per cent of it accounted for by business-to-business (B2B) e-commerce.

To seize the IT industry's potent opportunity for fuelling economic growth, the Government and private sector have developed an Internet strategy for the Philippines or ISP.com. This embodies a comprehensive strategy to develop an environment conducive to investment in and growth of e-commerce. The plan identifies a focus market where Filipino companies can concentrate initially and immediately to maximize the inherent advantages of the country's human resources. It also outlines how the Government will create a physical, educational, financial, logistical and legal/ institutional environment conducive to IT development and e-commerce. This framework recognizes that the development of e-commerce should be led by the private sector with government intervention limited to what is essential and manifested in a manner that is non-discriminatory, flexible and technologically neutral. The spearheading and monitoring of this plan now falls under the Information and Technology E-Commerce Council (ITECC), which is jointly chaired by the Department of Trade and Industry, the Department of Science and Technology (DOST) and the private sector.

The ITECC initiatives to make the Philippines the leading regional centre for e-services hosting a variety of global enterprises in information technology and other professional services is further strengthened by the creation of a new Cabinet Cluster on Information and Communication Technology to cover not only e-commerce but also to look at the overall ICT policy environment. This policy set of the new Government made ICT the leading sector for economic growth. This important sector draws strength from human resources and offers bright prospect for the Philippine economy and its people.

Clearly, the Philippine Government is attaching great priority to this area and the major challenge is how to convert the present potential into success. The Philippines has rated well in most surveys on IT readiness. For example, on matters related to access to policy makers and the policies themselves as described in the laws and regulations that could be obtained from the Government, the Political Economic Risk Consultancy rated the Philippines highly. However, as to the execution, implementation and follow-through of policies, the Philippines scored poorly. The challenge for the Government is to be able to create or recreate that environment so that the rules are very clear and are applied consistently and transparently.

The growing Internet-based e-commerce activity has the potential of altering economic activities and the social environment as most companies and consumers will opt for speedy transactions and lower costs. The information highway enables firms to transform the way they do their businesses by creating new opportunities and facilitating access to new markets. The challenge for the Government is how to create an environment to propel e-commerce growth while not compromising the public good. As e-commerce or transactions through the Internet will boost international trade, Government facilities and services must also be aligned to business needs and requirements.

VII. INTEGRATION OF INDUSTRIAL ACTIVITIES AT THE REGIONAL AND GLOBAL LEVELS: THE EXPERIENCE OF MALAYSIA

Wan Hasmah Wan Mohammed [54]

A. Brief overview of Malaysia's economic performance

The Malaysian economy rebounded strongly in 2000 after recovering from the sharp output decline in 1998 and early 1999 following the financial crisis. The economic turnaround which began in the second quarter of 1999 has since become well-entrenched, underpinned by the return of confidence and a more stable economic environment made possible by the introduction of selective capital controls and the pegging of the ringgit. The economic recovery, initially led by the strong performance of external demand, has become broad-based, driven by the increase in aggregate domestic demand following the impact of expansionary fiscal and accommodative monetary policies.

Reflecting these trends, real Gross Domestic Product (GDP) registered growth of 10.3 per cent in the first half, based on growth of 11.9 per cent in the first quarter and 8.8 per cent in the second quarter. Based on performance in the first half of the year and the sustained growth for the second half, real GDP is expected to register growth of 7.5 per cent in 2000, compared with 5.8 per cent in 1999.

1. Sectoral output

All sectors are expected to register positive growth in 2000 with the recovery becoming increasingly broad-based during the course of the year. The manufacturing sector is expected to lead growth given the anticipated double-digit growth in both domestic-oriented and export industries. Underpinned by the strong global demand in electronic products, economic recovery in Asia as well as the continued improvement in domestic demand, value added in the manufacturing sector is envisaged to record significant growth of 17 per cent in 2000. The output of export-oriented industries is estimated to expand by 22.4 per cent (1999: 10.8 per cent). Likewise, the growth of domestic-oriented industries is also expected to be maintained in 2000, with growth estimated at 17 per cent on the back of rising incomes, lower interest rates as well as accelerated public spending on infrastructure. As the manufacturing sector's output is expected to surpass growth in GDP, its share in real GDP is expected to increase to 32.6 per cent (1999: 30 per cent). The performance of other sectors is expected to register marginal growth, i.e. the services sector 4.9 per cent (1999: 3.9 per cent), the mining sector 0.6 per cent (1999: 3.1 per cent) and the construction sector 3.1 per cent (1999: 5.6 per cent).

2. Prospects for 2001

The economic outlook for 2001 continues to be favourable. Growth is expected to be sustained by the stronger performance of the private sector, which will provide the primary stimulus for growth. The Government will, however, continue to support the private sector in ensuring that growth in economic activities is sustained. In addition to fiscal stimulus, the Government will continue to support economic growth through measures that promote expansion in domestic demand and

[54] Principal Assistant Director, Ministry of International Trade and Industry, Kuala Lumpur.

Key economic indicators

	1999	2000 (estimate)
Real GDP growth (percentage)	5.8	7.5
Manufacturing output growth (percentage)	13.5	17.0
Unemployment rate (percentage)	3.0	2.9
Balance of payments (Millions of ringgit)	17 819	8 156
External trade (Millions of ringgit)	72 311	57 889
Inflation rate (percentage)	2.8	1.9
Per capita income (ringgit)	12 305	12 883

Source: *Economic Report 2000/2001.*

development of new sources and strengthen the nation's competitiveness and resilience while further improving the quality of life.

Growth in GDP is expected to remain at 7 per cent for 2001. The continued expansion in economic activities is expected to be achievable in an environment where external demand will continue to support aggregate domestic activities generated by a broad-based recovery. The manufacturing sector is projected to continue to register double-digit growth of 12 per cent to retain its position as the leading sector of the economy.

B. Industrial development and the role of foreign direct investment

Malaysia's industrial development process went through various phases which can be loosely divided into: the pre-independence extractive and primary commodities production phase, the post-independence import substitution phase, the export orientation phase, the investment-linked trade development phase and the post-crisis recovery phase. These phases were identified by the orientation of the industries' activities, markets, investments and the policies that became their driving force.

Prior to 1957, the industrial activities carried out in the country were rubber processing, tin smelting and light engineering works supporting them, as well as the manufacture of food, beverages, tobacco and cement. As a British colony, investments were mainly of British origin and also went into commerce and trade to support the export of the primary products to, and the import of manufactured goods from, the United Kingdom.

As the political situation improved after independence, the Government adopted an aggressive economic diversification programme to boost export earnings. Import substitution, particularly of manufactured goods, initiated Malaysia's industrialization agenda. There was growth in the food, beverages and tobacco industries, simple construction materials and activities related to printing and publishing.

The resulting inflow of FDI was partly to protect the British presence in this emerging market. In addition to coming from the United Kingdom, these first FDIs also came from the United States of America, Europe and Japan. Local businesses remained in the retail trade, mining and property development as challenges of insufficient capital, a small domestic market with a preference for foreign goods and dependence on foreign technology and other expertise prevented them from venturing into the manufacturing sector.

The introduction of the Investment Incentives Act in 1968 and the promotion of free zones in 1971 marked the third phase of industrial development. Attracted by the incentives and supported by relatively low wages, infrastructure facilities and the stable political and economic environment, many large transnational corporations (TNCs) established export-oriented operations in Malaysia, particularly in the electrical and electronics and textiles and apparel sectors.

By 1973, Singapore replaced the United Kingdom as the premier FDI benefactor in terms of output and value added. Together, Singapore, Japan and Hong Kong, China accounted for over 60 per cent of total FDI in the country. FDI from Japan, Europe and the United States expanded as petroleum and natural gas production projects came on stream towards the end of the phase.

The next phase of industrial development followed the thrusts of the Industrial Master Plan (IMP), 1986-1995, followed by the Second Industrial Master Plan (IMP2), 1996-2005. In achieving the objectives of the plans, it was necessary to secure further MNC involvement and FDI support in terms of capital, technology and market access.

Following the recession years of the mid-1980s, Malaysia deregulated its economy and liberalized by relaxing equity conditions to ensure that FDI inflow continued to expand. Further diversification saw ventures into heavy industries such as iron and steel, cement industries and the national car project. These industries generated a host of supporting industries and promoted forward and backward linkages in the manufacturing sector. These deliberate efforts resulted in FDI expansion after 1988 with variations in their sources, most notably the newly industrialized economies (NIEs) of Taiwan Province of China; Hong Kong, China; the Republic of Korea; and the ASEAN countries.

The electrical, electronics and food industries were the main choices for foreign investments in the early 1980s. The amount of FDI per project became larger as capital-intensive sectors such as petroleum and natural gas as well as downstream petrochemical projects began to locate in Malaysia to leverage on the advantages offered.

The inflow of FDI into Malaysia has been influenced not only by pull factors such as investment incentives, various inputs towards lowering the cost of production and cultural and political factors but also by push factors from within the benefactor country. As Malaysia became more and more liberalized, it became easier for the TNCs and MNCs to trade internationally and pursue their business objectives.

The industrialization initiatives undertaken by the Government resulted in the changing composition of the country's GDP with the manufacturing sector overtaking the agriculture sector's share in GDP. In 1985, the agriculture sector's share of GDP was 20.8 per cent; it decreased to 18.7 per cent in 1990 and was projected to further decrease to 10.5 per cent in 2000. The manufacturing sector's share increased from 19.8 per cent in 1985 to 27.1 per cent in 1995.

C. Challenges of globalization to small and medium-sized enterprises

The small and medium industries (SMIs), which constitute more than 90 per cent of the total manufacturing establishments, continued to play an essential supportive role in the country's industrialization efforts. In 1999, the sector's contribution to total manufacturing output increased to 18.9 per cent from 15.8 per cent in 1998. In terms of value added and employment, its contribution remained essentially at the same level. In 1999, SMIs contributed 20.9 per cent to

the value added and 29.7 per cent to employment in the manufacturing sector.

The cluster-based industrial development approach of the Second Industrial Master Plan (IMP2) reaffirmed the critical role of SMIs as dynamic supporting linkage industries and as an integral part of the manufacturing sector. IMP2 identified one of the major factors contributing to the low level and poor linkages of existing industries as being the absence or inadequate participation of domestic SMIs as key suppliers and service providers to the leading industries. This is further demonstrated by the high import content of these industries and the reliance on foreign-based research and development and technology service providers.

The dictates of the global market require SMIs to increasingly emphasize compressed product life cycles, quality improvements and product and process innovation. For SMIs, research and development and technology will assume greater importance as prerequisites for enhancing Malaysia's export competitiveness. Emphasis is given to readjusting the SMI development strategy to promote production efficiency and consolidate, strengthen and extend the coverage of the existing SMI programmes.

With the onslaught of globalization and liberalization, Malaysian SMIs will need to respond swiftly and strengthen their competitiveness, especially with the emergence of new challenges that are changing the business environment, both domestically and globally. Of these, the most prevalent are the regional and global competition as well as the new emerging technologies, especially information and communications technology (ICT).

1. Regional and global competition

Multilateral and regional trade and investment liberalization has integrated the Malaysian economy into the world economy, making markets more accessible and competition more intense. The ASEAN Free Trade Area (AFTA), in particular, offers significantly increased market access to competitive and export-oriented companies. The impending removal of trade barriers, in particular, will have a profound impact on SMIs protected in the local markets.

2. New emerging technologies

Rapid changes in industrial as well as information and communications technology have contributed to productivity growth and economic competitiveness. The new emerging technologies have been apparent in terms of increased efficiency and widespread availability of productivity-enhancing products and processes. Declining costs of new business technology utilized by large companies, such as Enterprise Resource Planning (ERP), are now accessible to SMIs in terms of functionality and scalability.

With competitiveness being increasingly defined by leading-edge technologies, it is crucial that SMIs rapidly develop the capacity to adopt and adapt those that are appropriate to their industries and production activities. Increasing absorptive capacity will require investments in capital equipment and software as well as training and skills development.

D. Development programmes for small and medium-sized industries

The greater focus by the Second Industrial Master Plan (IMP2) on SMIs called for institutional strengthening which included the establishment of the Small and Medium Industries Development Corporation (SMIDEC) in 1996 with the objective of promoting and coordinating the development of SMIs in Malaysia. Through the formulation, coordination and administration of SMI policies

and programmes, SMIDEC, along with other ministries and agencies, has collaborated with the private sector to upgrade the capabilities of SMIs to enhance their global competitiveness.

In terms of approach, a combination of both market-driven and policy-driven approaches has been adopted. In line with the IMP2, the Government develops inter- and intra-industry linkages through the following programmes:

1. Industrial linkage programme

This is a cluster-based industrial development programme where SMIs are matched with larger-scale companies to provide market opportunities as well as strengthen their competitiveness as reliable and cost-effective manufacturers and global suppliers of parts and components and related manufacturing services. This programme is backed by other capacity-building-related programmes such as technology development, technology acquisition, market development, enterprise development, skills development and institutional support from SMIDEC. Participation in the programme is promoted through both fiscal and non-fiscal incentives provided by the Government to the participating larger companies as well as to the SMIs.

2. Global supplier programme

In the coming decade, dynamic changes occurring at the international and domestic levels will shape the future competitiveness of the country's SMIs. At the same time, rapid technological changes, the creation of new skills, removal of barriers to human and financial capital mobility and worldwide concern for the preservation of environment will present opportunities and challenges. These trends will require the SMIs to gear themselves to face stiffer domestic and foreign competition in the future.

One approach to assist SMIs in achieving the global supplier status is through the Global Supplier Programme (GSP) currently being implemented by SMIDEC together with large corporations and training providers. Through understanding the requirements of the large corporations, SMIs attach critical importance to quality, cost and delivery in the new business model of supply chain management.

Through this programme, the capacities and capabilities of SMIs to provide world-class services and products in the supply chain will reduce the dependency of large corporations on importing their required input, thus saving time and costs on delivery. In this programme, as corporations strive to reduce costs and cycle time in a competitive global economy, large corporations are compelled to assist in the development of their local suppliers so that they can grow in tandem with their business needs. The ultimate objective of this programme is that SMIs will not only be able to supply the large corporations, but also their worldwide operations.

3. Export development programme

To provide easier access to markets for SMIs, SMIDEC implements programmes to assist SMIs in identifying and exploring new markets and strengthening existing ones. The Export Development Programme provides financial assistance in the form of matching grants under the Business Planning and Development Scheme as well as the Market Development Scheme. SMIDEC also organizes the annual "SMIDEX 2000", which provides opportunities for local SMIs to exhibit their products, parts and components. Business-matching sessions were also organized in conjunction with this event, which enables large companies, international procurement offices (IPOs), international procurement centres (IPCs) and other international buying missions to source their components and parts.

4. Enhancing technological capability

One of the major constraints confronting SMIs in their drive towards global competitiveness is their lack of technological capability to match the requirements and specifications needed by the large companies. To overcome this major shortcoming, the Process and Product Development Scheme (ITAF 2) has been designed to provide financial assistance in the form of matching grants to SMIs to undertake product or process improvement or development.

SMIs are also encouraged to acquire international quality systems and standard certifications to enhance their competitive advantage. Under the Product and Quality Improvement Scheme (ITAF 3), matching grants are provided to SMIs to undertake programmes on quality and productivity enhancement, as well as conformance to international standards, such as ISO 9000, ISO 14000, Hazard Analysis and Critical Control Points (HACCP), product certification and product development.

E. Integration at the regional level

As a member of ASEAN, Malaysia's experience in industrial integration has been through various ASEAN programmes, most notably the ASEAN Industrial Cooperation Scheme (AICO), the ASEAN Economic Ministers (AEM)-MITI Japan Economic and Industrial Cooperation Committee (AMEICC) and the newly formulated ASEAN Investment Area (AIA).

1. ASEAN Industrial Cooperation Scheme (AICO)

The AICO scheme is an industrial cooperation mechanism to promote joint manufacturing activities among companies based in ASEAN. The scheme became active on 1 November 1996. It offers companies located in different ASEAN member countries the opportunity to benefit from economies of scale through resource sharing and industrial complementation. Qualified participating companies will benefit from the Common Effective Preferential Tariff (CEPT) rates immediately, instead of waiting for the CEPT rates to reach the final range of 0-5 per cent by 2003.

The attractiveness of the AICO scheme is enhanced by a liberal interpretation of resource sharing, industrial complementation and industrial cooperation and allowing intra-firm exchange of final products in the scheme. Specific measures have also been introduced to facilitate speedier processing and consideration of AICO applications received between 1 January 1999 and 31 December 2001, namely:

- Automatic waiver of the 30 per cent national equity requirement;
- AICO processing time reduced from 60 days to 45 days, issuance of certificate of eligibility reduced from 14 days to 10 days, for the internal procedure to effect the preferential tariff rate;
- Conditional approval can be granted by participating countries when national policy, domestic laws and regulations require that such a condition be imposed.

Currently, companies granted AICO status are all MNCs. However, a total of 61 Tier 1 and Tier 2 suppliers of parts, components and raw materials have been brought into these AICO arrangements, of which 70.5 per cent are SMEs. In order to facilitate greater participation in the scheme by SMEs, the 31st ASEAN Economic Ministers Meeting, held in Singapore on 30 September 1999, agreed to allow the participation of trading companies in the Scheme but limited to arrangements involving SMEs only.

For the year 2000, Malaysia received a total of 46 applications, of which 38 were approved. The

proposed projects were from the automotive, electronic, electrical, food, packaging and petrochemical subsectors. In total, 116 applications were received by the ASEAN Secretariat as the coordinator for all AICO applications, of which 70 applications were approved.

2. Regional integration through AMEICC

The ASEAN Economic Ministers (AEM)-MITI Japan Economic and Industrial Cooperation Committee (AMEICC) focuses on the work programme to improve ASEAN competitiveness, enhance industrial cooperation in ASEAN and provide development cooperation assistance to new ASEAN members. Eight working groups have been established under AMEICC to implement its work programme in the areas of automobiles, chemicals, consumer electronics, human resources development (HRD), supporting industry/SMEs/ rural industrialization, statistics, textiles and garments and development of the West-East Corridor. Additionally, 10 existing ASEAN Working Committees have also been tasked to implement the AMEICC Work Programme related to the respective areas of standards and quality, industrial cooperation, agriculture and forestry, customs matters, services, minerals, electronic commerce, e-ASEAN, information infrastructure and intellectual property.

The ASEAN-Japan Joint Action Plan was endorsed by the ASEAN-Japan Summit on 28 November 1999. It serves as a means to further broaden economic cooperation between ASEAN and Japan. Programmes identified for implementation include:

- Measures to accelerate regional economic integration;
- Trade and investment promotion;
- HRD;
- SMEs and supporting industries policy upgrading;
- Economic integration of new ASEAN member countries.

Malaysia and Japan have jointly implemented a third country training programme under AMEICC so as to promote human resources development in ASEAN investment promotion agencies. It is aimed, among others, at assisting the economic integration of the new ASEAN member countries into the grouping.

3. ASEAN Investment Area (AIA)

FDI has played a major role in the industrialization of developing countries of ASEAN. Recognizing the advantages the region has to offer as a single investment target, as well as streamlining and facilitating intra-ASEAN capitalization, a framework has been formulated for the ASEAN Investment Area and was signed by the ASEAN Economic Ministers in Manila in October 1998.

AIA is aimed at establishing the ASEAN region as a competitive investment area by 1 January 2010, with a liberal and transparent investment environment, and at contributing towards achieving the free flow of investments in the region by 2020. AIA covers all direct investments, excluding portfolio investment and matters relating to investment covered by other ASEAN agreements such as the ASEAN Framework Agreement on Services (AFAS).

Under the AIA Agreement, three programmes have been implemented, i.e. in the areas of investment cooperation and facilitation, promotion and awareness and investment liberalization. The scope of the AIA agreement has also been expanded to include services incidental to manufacturing, agriculture, fishery, forestry and mining. AIA presently covers all direct investments and investments in services incidental to these sectors.

F. Private-sector initiatives

Various industry associations have been formed within the country's industry groups. With the advent of ASEAN and AFTA, these associations have developed affiliations among the ASEAN community in order to maximize opportunities and manage the challenges of liberalization. An example is the ASEAN Chemical Industry Club, which held its 30th Conference at Kuala Lumpur in November 2000. Responsible Care (RC) remained ACIC's key programme and its implementation in Malaysia has been a priority of the Chemical Industry Council of Malaysia (CICM) since 1994. Motivation to implement RC programmes has been increased by the Government's timely enforcement of various items of legislation on hazardous chemicals, safety, health and environmental protection. At present, 59 signatories out of a total membership of 93 companies benefit from the programme, but this number will increase in response to the global trend of greening the manufacturing sector and markets becoming impenetrable to non eco-friendly products.

Another key programme of ACIC is to seek consensus and support from ASEAN Governments on regulatory harmonization, particularly the harmonization of labelling requirements in the workplace as well as transport of chemicals. This is a necessary step towards reducing the cost of doing business, which will serve to enhance competitiveness and inter- as well as intra-ASEAN trade.

G. Conclusion

The Malaysian economy has undergone various structural changes, transforming the country from a primary commodity producer into a diversified economy with a strong industrial base. Malaysia's initial steps in industrialization were a policy-driven process with greatly emphasized promotion of selected industrial sectors to attract foreign direct investment (FDI). The importance of FDI and its influence on subsequent policy directions can be traced throughout the country's industrial development.

As a small, open economy, Malaysia has taken advantage of the onset of globalization by adopting liberalization policies in investment and trade to increase foreign participation, particularly in export-oriented sectors that are dominated by multinational corporations (MNCs). To a certain degree, MNCs that locate in Malaysia have been able to create and establish linkages within their industry clusters. However, as small and medium-sized companies (SMIs) make up 90 per cent of the total number of manufacturing establishments but contribute only 18.9 per cent of total manufacturing output, their upgrading and enhancement continues to be an important item in managing globalization.

As a member of ASEAN, Malaysia has been an active proponent of and participant in its cooperation programmes towards trade facilitation and industrial integration. These include programmes under the ASEAN Free Trade Area (AFTA), ASEAN Industrial Cooperation Scheme (AICO), and the ASEAN Investment Area (AIA) and cooperation in the sectors of services, standards, customs matters, agriculture, transport and communication, tourism, energy, intellectual property, finance and information technology.

Malaysia will continue to progressively liberalize various sectors of the economy at a pace that matches the country's capability, in response to more aggressive globalization. The Second Industrial Master Plan (IMP2) will remain the thrust of future policies that will also be driven by Malaysia's obligations as a regional and global citizen.

PART II

VIII. ACTIVITIES OF THE INTERNATIONAL TRADE AND INDUSTRY DIVISION

The International Trade and Industry Division (ITID) continues to undertake various activities related to policy-making, capacity-building and skills development for the countries in the Asia-Pacific region through a combination of research and project activities. In accordance with ESCAP's aims, ITID focuses on marginalized economies and economies in transition and assists them in coping with changes in the regional and global economic environment by providing information, advice and assistance for upgrading skills and institutions and integrating into the regional and global economy. Some of the major activities of the Division are listed below:

1. Policy

- *Industry*: In the industrial sector, ITID works towards promoting policy-making to assist in the development of industrial activities at the domestic and regional levels.To this end, numerous studies have been prepared on the effect of the Asian crisis on industrial development, utilizing industrial complementarities at the regional and global levels, promotion of agro-industrial small and medium enterprises (SMEs) in the Asia-Pacific region and assisting integration of industrial activities at the regional and global levels.
- *Trade*: Trade policy focuses on promoting trade between and among various countries in the Asia-Pacific region and utilizing comparative advantages among economies at different levels of development. ITID works towards facilitating integration into the international trading system through capacity-building and human resources development by formulating policy to assist economies in achieving these goals. Studies prepared for least developed countries (LDCs) and transition economies to gain from the experience of more developed countries include:
- "New approaches to trade and investment policies in the post crisis era in Asia and the Pacific", with separate studies for the Asia-Pacific region; Republic of Korea; Hong Kong, China; Malaysia; and Thailand. The full text of the studies is available on the ITID web site at <*www.unescap.org/itid/publication/occasional.htm*>.

  ITID also identifies research and training needs in the Asia-Pacific region through meetings and consultations with Governments and multilateral organizations.
- *Investment*: The promotion of domestic and foreign investment is among the priority activities of ITID. This involves the creation and maintenance of a trade and information services network including market research on manufactured goods and raw materials and commodities as well as investment-related material for Asia and the Pacific. National data on trading options and prospects for investment is available through the monthly TISNET bulletin. Also, the Asia-Pacific International Trade Fair (ASPAT) is held regularly, with the next one planned for 2002. It is the major event for trade promotion in the Asia-Pacific region to promote trade and investment opportunities and to facilitate interaction between prospective investors and clients as well as

to showcase the potential sectors for investment in the Asia-Pacific region.

- *Technology*: Following on from the United Nations' promotion of the increased use of information technology and the overall ESCAP vision for a more technologically advanced region, technology policy involves assisting marginalized economies in the Asia-Pacific region in improving infrastructure and human resources to narrow the digital divide. Various studies have been prepared on the status of information technology in the region, the implications of globalization on technology and the use of information technology for development purposes, including commercial and social aspects such as information exchange, use in industry, capacity-building and e-commerce.
- Study on "Information technology and development I: commercial and industrial dimensions". Available at <*www.unescap.org/itid/PAPER1.PDF*>.
- Study on "Information technology and development II: capacity-building, cooperation and social dimensions". Available at <*www.unescap.org/itid/PAPER2.PDF*>. Summaries of both papers are also available through links at <*www.unescap.org/itid/JUN2_00.HTM*>.

2. Capacity-building

ITID activities also prioritize capacity-building and assisting in institutional development, especially for least developed countries (LDCs) and economies in transition to allow them to benefit from the changes in the regional and global trading system, instead of being further marginalized by them. To this end, capacity-building focuses on:

- *Industry*: capacity-building for industries in the Asia-Pacific region focuses on activities to improve skills and assist in the preparation of industrial projects. Enterprise development is an important part of capacity-building targeted by ITID. Programmes include national training workshops on private-sector development, privatization and deregulation in selected developing countries in the Asia-Pacific region.
- *Trade*: In order to develop the trading capacities of the economies in the region and to assist countries in integrating into subregional, regional and global trading arrangements, ITID activities emphasize capacity-building through national and regional workshops and through advisory services in areas relating to trade information, information technology and accession to the World Trade Organization (WTO). Some recent activities have included:
  - *(a)* Workshops and advisory services for trade. Recent advisory services have included assistance to Bangladesh and forthcoming services include providing advice to Maldives over cumulative rules of origin in SAARC. ITID advisory services are based upon requests from Governments.
  - *(b)* Export promotion and skills training for the export of manufactured products and commodities, especially for LDCs and transition economies.
  - *(c)* Capacity-building and advice for trade facilitation in South-East Asian LDCs. Export assistance to industries in the former Indo-China economies is provided in the form of Advisory Assistance to Industry for Export Promotion (AAIEP).
  - *(d)* Various workshops on training policy makers and officials to create an enabling environment for the promotion of investment.
  - *(e)* Advisory services and human

Box 15. The role of ITID in promoting private-sector development in Asia and the Pacific

Private-sector development has been an important issue since the 1980s. A combination of circumstances including the poor performance of State-owned corporations and the need to become more competitive in the global economy led to a shift to private-sector development in the late 1980s. As former Soviet economies became independent, this trend also encompassed them, especially as it was believed that privatization would lead to the development of an effective market-based economy. In least developed countries, private-sector development including privatization, promotion of small industries and the establishment of a business environment suitable for the growth of competitive industries has been promoted for efficient distribution of resources and as a means of increasing economic growth. Thus, in the economies of Asia-Pacific, private-sector development has occurred for various reasons as more developed economies like Australia, New Zealand, Singapore and Hong Kong, China promoted the private-sector as a means of increasing output and efficiency and not only for increasing government revenue while in developing economies, private-sector development (and especially privatization) was seen as a way to increase government revenue by selling off State-owned corporations. In economies in transition, private-sector development was often a reaction to the previously State-owned and controlled means of production, marketing and distribution facilities.

Despite initial problems in many countries and the slow rate of policy changes in others, private-sector development remains an essential part of overall restructuring efforts for developing countries to move to a more efficient economy. Improvements in the business environment can lead to increased foreign direct investment and increased competition, leading to a higher degree of efficiency and income growth.

With the aim of achieving optimum growth of the private-sector to improve the capacity of the economies of Asia and the Pacific, ITID has prepared studies and undertaken projects to promote entrepreneurial development and business skills and to provide information about the potential of private-sector development in leading to overall capacity-building for developing economies in the region. Some activities undertaken have included workshops on private-sector development, privatization and deregulation in selected economies and advisory services for optimum private-sector development.

resources development on WTO rules and regulations and on accession issues. The first joint WTO/ESCAP trade policy training course was held in 2000 to provide information and prospects for developing countries with respect to changes in international trade brought about by WTO. The second course, in May-June 2001, will continue with information on WTO rules and policies and give an overview of prospects and challenges faced by developing countries as the present multilateral trading situation evolves. This training course is expected to increase the capacity of trade policy-makers in developing countries to adapt trade policy to benefit from changes in the international trading system instead of being further marginalized.

(f) UNCTAD and ESCAP jointly organized a regional workshop on commodity export diversification and poverty reduction in South and South-

Box 16. AAIEP activities in Indo-China

The focus of the Advisory Assistance to Industry for Export Promotion (AAIEP) project in 2000-2001 has been on providing an integrated package of assistance, especially in quality management and export promotion (at both the institutional and policy levels) in Cambodia, the Lao People's Democratic Republic and Viet Nam. New project partners were identified in Cambodia and Viet Nam, and cooperation with ESCAP, GTZ and other donor projects was significantly increased, leading to an integrated package of assistance to these economies. A revised impact-monitoring system was developed and is currently being used by project staff and partners. Important activities in each economy are briefly described below:

Cambodia

- Activities were undertaken in export promotion, mainly a market study on the *Export potential of Cambodian fishery products* and a related conference was held on promoting the fisheries sector in Cambodia. Other activities included two workshops on food safety and hazard analysis and critical control points (HACCP).
- Future activities related to promotion of the fisheries sector include developing an action plan and a trade strategy for this sector and a national workshop to facilitate interministerial coordination to simplify Cambodia's export procedures.
- Activities were also undertaken in training of trainers of the staff of Enterprise Development Cambodia (EDC) in providing services to enterprises. Further training is planned for late 2001.
- AAIEP has promoted public/private-sector partnership through various workshops and an exposure trip to Thailand for building the capacity of the provincial government in implementing policies and improving cooperation with the private sector.
- Future activities include follow-up to the capacity-building initiative to promote private-sector development and encourage decentralized government.
- Government officials were also trained on quality management and industrial standards and follow-up activities are planned in this area as well.
- Another donor conference, following last year's conference on promoting the private sector, is planned for 2001. Increased donor cooperation and minimized duplication of activities are expected to result from this conference.

Lao People's Democratic Republic

- Activities in business services included training of trainers by using the work improvement for small enterprises (WISE) module, which was developed by the International Labour Organization (ILO).
- Future activities will focus on another training of trainers session on improving productivity and quality control, depending on the sustainability of the WISE module.
- Other activities included the development of a film on AAIEP activities in the Lao People's Democratic Republic and the publication of the *Handbook on Natural Dyes*.

Viet Nam

- Project activities in Viet Nam aim at developing local business services for SMEs in the field of quality management. Activities included training of trainers workshops on team-building and two week-long training courses on developing communication skills.
- Future activities include:
    - Further training of trainers on quality management including auditor certification, training in communication skills and on-the-job training.
    - Product development assistance including development of public/private-sector cooperation.
    - Assistance in marketing, including development of a marketing concept for the product (price, promotion, etc).
- Future activities also include providing advice on export promotion services.
- AAIEP organized a workshop on "Seafood exports: quality and environmental issues and implications", leading to a seminar in January 2001.

East Asia at Bangkok from 3 to 5 April 2001. Full text of papers available at: <*www.unctad.org/infocomm/Diversification/bangkok/bangkok.htm*>.

- *Technology*: in the technology field, ITID focuses on developing human resources and increasing the capacity of institutions in the Asia-Pacific region through training and assistance in technology adaptation and transfer. Some recent programmes include:
  - *(a)* Human resources development for information technology.
  - *(b)* With the aim of assisting in the development and transfer of technology as well as promoting consultations on technological issues, a technology consultant development programme for Asia and the Pacific (TCDPAP) has been established which facilitates capacity-building in information technology through a roster of experts on technology.
  - *(c)* Another forum for development, transfer and adaptation of new and existing technology among Asia-Pacific countries is the Asia-Pacific Centre for Transfer of Technology (APCTT), which facilitates technology transfer among the economies of the Asia-Pacific region.
  - *(d)* A proposed project on information technology development in Pacific island economies would assist in developing skills and institutions for IT (see box 17).

3. Private-sector development

ITID activities in private-sector development include, in addition to human resources development and provision of advisory services, workshops and training programmes on private-sector development and research work on options for private-sector development in subgroups of economies in the Asia-Pacific region such as:

- Private-sector development and privatization in the Greater Mekong Subregion: this is contained in the Hi-Fi plan for private-sector development in the region. The plan focuses on:
  - *(a)* H: Human resources development for the GMS business sector through training courses including distance learning. It also includes SME training and development through assistance in marketing, finance and quality management.
  - *(b)* I: Institutional capacity-building, which includes strengthening business associations and chambers of commerce, establishment of a GMS business support centre, advisory export assistance to industry for export promotion and trade policy reform.
  - *(c)* F: Facilitation measures, which have led to the establishment of a GMS trade facilitation working group in cooperation with the Asian Development Bank and emphasis on public- and private-sector partnerships.
  - *(d)* I: Investment promotion measures including understanding and promoting the role of foreign direct investment, simplifying regulation and promoting human resource development.
- Studies on options for private-sector development in economies in transition and various other subgroups of economies.

4. Promoting SMEs

An important activity of ITID, whether in providing advisory services, research or training programmes, is the promotion of small industries

Box 17. Information technology and development in the Asia-Pacific region

The development of new information and communications technologies (ICTs) has revolutionized the world by allowing faster, cheaper and more accessible information exchange across national boundaries. However, most of the advanced ICTs are being developed or exist in developed economies with many other economies, especially least developed countries and economies in transition, in the Asia-Pacific region yet to receive any benefits from the development of new technology or from their application. This has led to the formation of a "digital divide" which could further marginalize the developing economies in the world from sharing in the technology advance. ESCAP, in accordance with the United Nations mandate for narrowing the digital divide, has prepared programmes to assist developing economies in taking advantage of the information revolution and adapting and using technologies for their benefit. The role of ITID in ESCAP's overall IT strategy includes management of human resources for information technology, assisting Pacific island economies in using information technology for trade and investment promotion, assisting countries in the Greater Mekong Subregion in developing information technology capacities and preparing analytical studies on information technology in the Asia-Pacific region.

With the effective development of information technology, barriers of time, distance and nation States can disappear as countries use technology for human resources development, information provision and even trade. However, merely having technology without the means to apply it is useless for development. Thus, an ongoing ITID activity focuses on the management of human resources for information technology so that developing countries in the Asia-Pacific region can learn from more advanced economies such as the Republic of Korea on ways to improve skills in using information technology. New information and communications technologies are the driving forces of globalization and are thus necessary for developing and developed countries alike. But many developing countries do not have the infrastructural and human capacities to realize the benefits of a flourishing IT sector. India is a good example of the benefits of an effective IT policy focusing on human resources development and quality control leading to success. ITID activities assist developing countries in creating an enabling environment for IT through developing well-formulated policies, strengthening the regulatory framework, facilitating trade by using IT and developing skills. ITID activties focus on increasing the capacities of lesser developed economies in the region. The e-Mekong project will cover the Greater Mekong Subregion (GMS) and assist in adapting information and communications technology networks, developing skills and e-commerce and improve institutional capacity in selected sectors. Another activity aims to use information technology for trade and investment promotion in the Pacific islands and use IT to attract foreign investment by strengthening government capacity and promoting partnerships with the private sector.

As part of the ITID information technology promotional activities, the Asia-Pacific Centre for Transfer of Technology (APCTT), which is under ESCAP auspices, has networking and information technology programmes for SMEs. These include helping SMEs to access the Internet, access and utilize various databases including those on environmentally sound technologies and help SMEs to search for technological opportunities. APCTT Technical Bureau for International Industrial Partnerships, a joint partnership with UNIDO, the Small Industries Development Bank of India and the Ministry of Industry of the Government of India, has established a wide-area network and has connections with participating institutions in various Indian states to facilitate the development of IT-based small industries.

Box 17. Information technology and development in the Asia-Pacific region *(continued)*

In all ITID activities for the promotion of information technology and its use in development in the region, consultation with civil society and with regional and international private- and public-sector representatives is encouraged. At present, according to data from the International Telecommunication Union (ITU), the digital divide is growing with countries like the Republic of Korea and India having 15.3 million and 4.5 million Internet users respectively (July 2000 figures) while the Lao People's Democratic Republic had only 2,000 users and Myanmar had around 500. These numbers were low even compared with other least developed countries like Nepal (35,000 users) and Bangladesh (30,000 users). ESCAP and ITID activities focus on narrowing the digital divide in the Asia-Pacific region through upgrading capacity and skills and using information technology to develop cooperative arrangements among the public and private sectors for overall economic and social development.

Note: See "Information and communications technologies for poverty reduction in the Asia-Pacific region" in this publication for further discussion of the use of IT in development.

and the development of entrepreneurial skills among small entrepreneurs. Recent initiatives as part of these activities include:

- Promotion of rural industrialization and technology transfer in developing economies;
- Upgrading SMEs through national seminars on integration of quality and environmental management systems;
- Studies prepared for upgrading SMEs through integration of quality and environmental management systems;
- National workshops on environmentally-sound business development for SMEs in developing economies in Asia and the Pacific;
- Various subregional studies on the promotion of linkages between agriculture and industry for overall development of agro-industrial SMEs in the Asia-Pacific region;
- Promoting the role of women entrepreneurs.

5. Facilitating cooperation in subregional, regional and global forums

Along with policy advice, capacity-building and promotion of SMEs, ITID activities have an underlying theme of promoting cooperation among various subgroups of economies and between subregional organizations for exchanging experiences, information and technology and for consultation and dialogue in integrating into the global economy. These activities include:

Industry: promoting industrial complementarities at the subregional and regional levels through studies and projects emphasizing cooperative potential in industrial sectors. Studies have been prepared on integrating industrial activities and identifying and utilizing complementarities in various sectors such as textiles, automobiles and electronics. An expert group meeting on the integration of industrial activities at the regional and global levels in March 2001 focused on utilizing complementarities and sharing experiences in improving industrial competitiveness among economies at different levels of development in the Asia-Pacific region.

Trade: Trade policy aims at facilitating integration of all economies in the Asia-Pacific region into the international trading

system. Activities to promote such cooperation include various subregional trading arrangements and advisory services on the implications of continuing developments in the multilateral trading system of WTO. Some major activities emphasizing regional and subregional cooperation undertaken by ITID are:

- Establishment and development of various trading arrangements;
- Cooperation among various regional commissions has also been encouraged with a joint ECLAC/ESCAP meeting in 2000;
- The second WTO/ESCAP training course on trade policy for developing economies is to be held in May-June 2001.

Technology: cooperation in the technology field includes activities by APCTT and ITID in developing human resources and facilitating technology transfer through public- and private-sector partnerships, networking and intraregional and subregional cooperation.

Box 18. Intraregional and interregional cooperation in the Asia-Pacific region

As part of its plan to promote trading arrangements and establish the Asia-Pacific region as a strong presence in the global economy, ESCAP has established various subregional and interregional cooperative arrangements for dialogue, discussion and sharing of experience, expertise and technology. In addition to subregional arrangements such as the GMS project, there are centres for technology transfer and adaptation such as APCTT and also the consultancy database of TCDPAP. Some other activities fostering cooperation among the various economies include:

- Bangkok Agreement: promotes trade among China, Bangladesh, India, the Republic of Korea, the Lao People's Democratic Republic and Sri Lanka though exchanges of trade preferences;
- BIMSTEC: this is a subregional cooperative organization covering various sectors including trade and investment and consists of Bangladesh, India, Myanmar, Sri Lanka and Thailand;
- SPECA: it aims to assist Central Asian economies in adapting to the changing regional and global environment;
- The fifth consultative meeting of the executive heads of subregional organizations was held in June 2000. This meeting promotes subregional linkages and networking among economies at different levels of development in the Asia-Pacific region. The South Asian Association for Regional Cooperation (SAARC), the Association of Southeast Asian Nations (ASEAN), the South Pacific Forum, ESCAP and ECO attended;
- RNAEM: the Regional Network for Agricultural Engineering and Machinery promotes cooperation among economies in the Asia-Pacific region for increased agricultural productivity and output and aims to increase income-generation through efficient use of post-harvest technology, agricultural mechanization and information and technology exchanges. For 2001, a regional workshop on marine products and processing is to be held in China;
- Interregional cooperation is promoted through exchanges of information between ESCAP and other regional commissions of the United Nations.

PART III

Table 29. Growth rate of gross domestic product in selected Asia-Pacific economies (1997-2001)

(Percentage per year)

Economy	1997	1998	1999	2000*	2001*
Newly industrialized economies					
Hong Kong, China	5.0	-5.1	2.9	5.0	5.5
Republic of Korea	5.0	-6.7	10.7	7.5	6.0
Singapore	8.0	1.5	5.4	5.9	6.2
Taiwan Province of China	6.7	4.6	5.7	6.3	6.2
South-East Asia					
Cambodia	2.6	1.3	5.0	6.0	7.0
Indonesia	4.7	-13.2	0.2	4.0	5.0
Lao People's Democratic Republic	6.9	4.0	4.0	4.5	5.0
Malaysia	7.5	-7.5	5.4	6.0	6.1
Myanmar	5.7	5.0	4.5	--	--
Philippines	5.2	-0.5	3.2	3.8	4.3
Thailand	-1.8	-10.4	4.1	4.5	4.6
Viet Nam	8.2	4.4	4.4	5.0	6.0
South Asia					
Bangladesh	5.4	5.2	4.4	5.0	5.5
Bhutan	7.3	5.8	6.0	6.0	5.5
India	5.0	6.8	5.9	7.0	7.0
Maldives	9.1	9.1	8.5	7.0	7.0
Nepal	5.0	2.3	3.3	5.5	5.5
Pakistan	1.2	3.3	3.9	3.8	5.2
Sri Lanka	6.3	4.7	4.2	5.0	6.0
China and Mongolia					
China	8.8	7.8	7.1	6.5	6.0
Mongolia	4.0	3.5	3.5	4.0	4.5
Central Asian economies					
Kazakhstan	1.7	-1.9	1.7	3.0	3.3
Kyrgyzstan	9.9	2.1	3.6	2.5	3.2
Tajikistan	1.7	5.3	3.7	4.0	5.0
Uzbekistan	5.2	4.4	4.4	3.0	4.0
Pacific islands					
Cook Islands	-2.8	-3.8	2.8	4.2	--
Fiji	-1.8	-1.3	7.8	3.2	3.2
Kiribati	2.3	8.3	1.5	--	--
Marshall Islands	-5.3	-5.0	0.5	--	--
Micronesia (Federated States of)	-4.2	-0.8	0.3	--	--
Papua New Guinea	-4.6	2.5	3.9	4.6	--
Samoa	1.6	2.6	4.0	4.0	--
Solomon Islands	-0.5	-2.2	1.0	3.5	--
Tonga	-1.4	0.1	2.2	--	--
Tuvalu	3.5	14.9	3.0	--	--
Vanuatu	0.6	0.2	-2.0	--	--

Source: Asian Development Bank, *Asian Development Outlook 2000* (Manila, ADB).

Note: * Projections.

Table 30. Growth rate of per capita gross domestic product in selected Asia-Pacific econmies (1997-2001)

(Percentage per year)

Economy	1997	1998	1999	2000*	2001*
Newly industrialized economies					
Hong Kong, China	1.9	-7.8	0.6	2.7	3.4
Republic of Korea	4.0	-7.6	9.6	6.4	5.0
Singapore	5.9	-1.0	3.7	3.5	3.5
Taiwan Province of China	5.8	3.5	4.6	5.1	5.4
South-East Asia					
Cambodia	0.1	-1.2	2.4	--	--
Indonesia	3.1	-14.4	-1.3	2.5	--
Lao People's Democratic Republic	4.3	1.4	1.5	--	--
Malaysia	5.2	-9.2	3.0	3.7	3.8
Myanmar	3.7	3.1	--	--	--
Philippines	2.8	-2.7	1.0	1.6	2.1
Thailand	-2.9	-11.2	3.1	3.5	3.8
Viet Nam	6.2	2.7	2.5	3.1	4.0
South Asia					
Bangladesh	3.5	3.4	2.5	3.1	3.6
Bhutan	4.2	2.7	2.9	--	--
India	3.3	5.5	4.2	5.3	5.3
Maldives	6.0	5.5	4.5	3.5	--
Nepal	2.2	0.2	0.9	3.0	3.0
Pakistan	-1.2	0.9	1.5	0.3	3.0
Sri Lanka	4.9	3.5	3.0	3.8	4.8
China and Mongolia					
China	7.7	6.8	6.1	5.4	4.9
Mongolia	1.2	2.5	2.2	2.7	3.2
Central Asian economies					
Kazakhstan	--	--	--	--	--
Kyrgyzstan	9.5	0.7	--	--	--
Tajikistan	0.1	--	--	--	--
Uzbekistan	3.4	2.2	2.4	--	--
Pacific islands					
Cook Islands	6.2	1.1	14.4	--	--
Fiji	-2.4	-4.7	1.9	6.6	--
Kiribati	1.5	1.5	--	--	--
Marshall Islands	-8.1	-8.1	--	--	--
Micronesia (Federated States of)	-5.5	-4.8	--	--	--
Papua New Guinea	-6.4	0.6	2.9	3.6	--
Samoa	1.0	--	--	--	--
Solomon Islands	--	--	--	--	--
Tonga	-1.8	-0.2	1.8	--	--
Tuvalu	2.2	13.6	1.8	--	--
Vanuatu	--	--	--	--	--

Source: Asian Development Bank, *Asian Development Outlook 2000* (Manila, ADB).

Note: * Projections.

Table 31. Sectoral share of gross domestic product

(Percentage)

Economy	Agriculture			Industry			Services		
	1980	1990	1999	1980	1990	1999	1980	1990	1999
Newly industrialized economies									
Hong Kong, China	0.8	0.3	0.1	31.7	25.3	15.2	67.5	74.5	84.7
Republic of Korea	14.9	8.5	5.0	41.3	43.1	43.5	43.7	48.4	51.5
Singapore	1.3	0.4	0.2	38.1	34.4	35.8	60.6	65.3	64.1
Taiwan Province of China	7.7	4.2	2.6	45.7	41.2	33.1	46.6	54.6	64.3
South-East Asia									
Cambodia	--	55.6	41.4	--	11.2	19.6	--	33.2	39.0
Indonesia	24.8	19.4	19.4	43.4	39.1	42.9	31.8	41.5	37.7
Lao People's Democratic Republic	--	61.2	53.1	--	14.5	22.2	--	24.3	24.7
Malaysia	--	15.2	10.8	--	42.2	46.2	--	42.6	43.1
Myanmar	46.5	57.3	59.5	12.7	10.5	10.3	40.8	32.2	30.8
Philippines	25.1	29.0	17.6	38.8	34.5	30.4	36.1	43.6	52.0
Thailand	23.2	12.5	10.4	28.7	37.2	40.1	48.1	50.3	49.6
Viet Nam	50.0	38.7	38.7	23.1	22.7	34.5	26.9	38.6	40.1
South Asia									
Bangladesh	41.2	29.4	25.2	16.3	20.9	24.3	42.5	49.7	50.5
Bhutan	56.7	43.2	38.6	12.2	25.3	33.3	31.1	31.5	28.2
India	38.1	31.0	27.9	25.9	29.3	26.0	36.0	39.7	46.1
Maldives[a]	--	--	17.3	--	--	17.5	--	--	65.3
Nepal	61.8	51.6	41.6	11.9	16.2	21.3	26.3	32.1	37.1
Pakistan	29.6	26.0	27.2	25.0	25.2	23.5	45.5	48.8	49.4
Sri Lanka	26.2	22.9	20.7	29.8	27.3	27.3	44.0	49.8	52.1
China and Mongolia									
China	30.1	27.0	17.3	48.5	41.6	49.7	21.4	31.3	32.9
Mongolia	13.6	15.2	36.1	34.3	40.6	22.2	52.2	44.2	41.7
Central Asian economies									
Kazakhstan	26.0	41.8	9.9	47.4	37.0	30.4	26.6	21.2	59.8
Kyrgyzstan	--	33.6	41.4	--	35.0	24.0	--	31.4	34.7
Tajikistan	--	27.1	22.1	--	45.5	22.2	--	27.4	55.8
Uzbekistan	--	33.1	33.0	--	33.0	24.4	--	34.0	42.6
Pacific islands									
Cook Islands	--	21.2	22.6	--	7.6	7.3	--	71.2	70.2
Fiji	22.1	--	--	21.5	--	--	56.4	--	--
Kiribati	31.5	18.6	20.4	6.9	7.6	6.0	61.6	73.8	73.5
Marshall Islands	--	13.9	13.7	--	12.9	13.8	--	73.3	72.5
Micronesia (Federated States of)	--	--	--	--	--	--	--	--	--
Papua New Guinea	33.1	29.0	30.9	26.8	30.4	35.9	40.0	40.6	33.2
Samoa	--	--	19.5	--	--	23.9	--	--	56.6
Solomon Islands	--	--	--	--	--	--	--	--	--
Tonga	38.5	35.1	37.7	14.4	14.4	11.9	47.1	50.4	50.4
Tuvalu	--	25.6	16.8	--	14.5	24.3	--	59.8	58.9
Vanuatu	--	20.0	23.1	--	13.5	11.4	--	66.5	65.6

Source: Asian Development Bank, Statistics and Data Systems Division. Available at <*www.adb.org/Documents/EDRC/Statistics/rt_13.pdf*>.

Note: [a] Data for Maldives from ADB, *Asian Development Outlook 2000* (Maniln, ADB).

Table 32. Growth rate of value added

Economy	AGRICULTURE					INDUSTRY					SERVICES				
	1997	1998	1999	2000*	2001*	1997	1998	1999	2000*	2001*	1997	1998	1999	2000*	2001*
Hong Kong, China	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Republic of Korea	4.6	-6.6	4.7	--	--	5.4	-7.5	13	--	--	6.5	-4.7	9.8	--	--
Singapore	-5.8	-5.7	4.9	1.6	1.5	7.3	0.9	4.4	4.9	5.0	8.7	1.8	5.4	5.8	5.8
Taiwan Province of China	-1.5	-6.6	3.1	-1.3	-2.4	6.1	2.7	4.5	6.5	6.3	7.4	6.2	6.3	6.5	6.5
Fiji	-12.5	-10.4	--	--	--	-0.9	-4.3	--	--	--	1.8	-1.8	--	--	--
Papua New Guinea	-1.2	-8.8	--	--	--	14.8	18.6	--	--	--	5.5	-6.1	--	--	--
Samoa	-5.9	7.0	--	--	--	-1.0	-9.4	--	--	--	5.7	7.1	--	--	--
Solomon Islands	--	--	--	--	--	--	--	--	--	--	--	---	--	--	--
Vanuatu	--	6.9	-9.3	--	--	--	-7.0	7.6	--	--	--	-0.7	-1.2	--	--
Cambodia															
Indonesia	1.0	0.8	0.7	3.0	3.5	5.2	-15.1	1.7	6.0	6.6	5.6	-16.2	-1.5	2.3	3.9
Lao People's Democratic Republic	7.0	3.7	3.2	--	--	8.1	8.5	10.5	--	--	7.5	4.8	7.9	--	--
Malaysia	0.4	-4.5	3.8	4.2	--	7.9	-11.0	8.5	1.5	--	11.1	-1.1	2.3	2.5	--
Myanmar															
Philippines	2.9	-6.6	6.6	3.0	--	6.1	-1.9	0.5	4.0	--	5.5	3.5	3.9	4.5	--
Thailand	-0.5	-0.3	0.5	1.5	2.0	-2.7	-13.6	8.3	6.8	6.5	-1.1	-9.4	1.4	3.0	3.4
Viet Nam	4.3	2.8	5.0	3.5	3.5	12.6	48.3	7.0	7.4	8.8	7.1	2.4	2.0	3.9	4.9
Bangladesh	6.1	3.2	3.9	3.2	4.0	5.8	8.3	4.0	7.5	7.0	4.8	4.5	5.0	7.0	5.5
Bhutan															
India	-1.9	7.2	0.8	--	--	5.9	3.7	6.2	--	--	9.0	8.3	8.0	--	--
Maldives															
Nepal	4.1	1.0	3.0	4.3	4.0	6.4	0.2	5.7	6.6	6.9	4.6	5.8	3.9	5.8	5.7
Pakistan	0.1	3.8	0.4	4.8	4.1	0.6	6.8	3.8	4.8	4.8	3.6	3.2	4.1	4.2	5.9
Sri Lanka	3.0	2.5	4.8	2.9	3.0	7.7	5.9	4.6	5.5	7.3	7.1	5.1	3.8	5.7	6.6

Source: Asian Development Bank, *Asian Development Outlook 2000* (Manila, ADB).
Note: * Projections.

Table 33. Foreign direct investment

(Millions of US$)

Economy	1994	1995	1996	1997	1998
Newly industrialized economies					
Hong Kong, China	4 131	3 279	5 521	6 000	1 600
Republic of Korea	809	1 776	2 325	2 844	5 143
Singapore	8 550	7 206	7 884	9 710	7 218
Taiwan Province of China	1 375	1 559	1 864	2 248	222
South-East Asia					
Cambodia	69	151	294	204	140
Indonesia	2 109	4 346	6 194	4 673	-356
Lao People's Democratic Republic	59	88	128	86	45
Malaysia	4 342	4 178	5 078	5 106	3 727
Myanmar	91	115	38	124	40
Philippines	1 591	1 478	1 517	1 222	1 713
Thailand	1 364	2 068	2 336	3 733	6 969
Viet Nam	1 500	2 000	2 500	2 950	1 900
South Asia					
Bangladesh	11	2	14	141	317
Bhutan	--	--	--	--	--
India	973	2 144	2 426	3 351	2 258
Maldives	9	7	8	8	7
Nepal	6	5	19	23	9
Pakistan	419	720	919	714	497
Sri Lanka	166	56	120	430	345
China and Mongolia					
China	33 787	35 849	40 180	44 236	45 460
Mongolia	7	10	16	25	19
Central Asian economies					
Kazakhstan	660	964	1 137	1 321	1 158
Kyrgyzstan	38	96	47	84	102
Tajikistan	10	15	16	4	30
Uzbekistan	50	120	55	285	85
Pacific islands					
Cook Islands	--	--	--	--	--
Fiji	68	70	27	34	91
Kiribati	--	--	--	1	--
Marshall Islands	--	--	--	--	--
Micronesia (Federated States of)	--	--	--	--	--
Papua New Guinea	57	455	111	29	30
Samoa	3	3	1	20	10
Solomon Islands	2	2	6	21	10
Tonga	--	--	2	1	1
Tuvalu	--	--	--	--	--
Vanuatu	30	31	33	30	28

Source: Asian Development Bank, *Asian Development Outlook 2000* (Manila, ADB).

Table 34. Growth rate of merchandise imports and exports in selected Asian and Pacific Economies

(Percentage per year)

Economy	IMPORTS					EXPORTS				
	1997	1998	1999	2000*	2001*	1997	1998	1999	2000*	2001*
Hong Kong, China	5.1	-11.6	-2.7	10.7	11.0	4.0	-7.5	-0.1	9.1	10.0
Republic of Korea	-2.2	-36.2	29.0	23.1	14.3	6.7	-4.7	10.1	10.0	7.4
Singapore	0.7	-23.2	6.8	7.9	8.8	-0.2	-12.2	2.6	3.5	5.3
Taiwan Province of China	10.1	-7.4	2.8	15.8	13.4	5.4	-9.5	6.8	12.5	11.5
China	8.3	-1.5	18.3	9.8	8.0	20.9	0.6	6.0	5.0	5.0
Lao People's Democratic Republic	-6.0	-14.7	-2.9	7.0	6.5	-1.2	7.7	2.9	5.0	6.0
Mongolia	-1.5	9.5	15.4	8.6	11.8	16.6	-12.1	2.8	12.8	14.3
Viet Nam	0.8	-2.1	1.2	16.0	17.0	26.5	1.0	22.3	10.0	10.0
Kazakhstan	8.3	-8.4	-28.2	9.3	7.9	9.7	-16.3	-4.8	9.5	6.9
Kyrgyzstan	-17.5	17.0	-29.4	7.5	4.6	18.8	-7.2	-19.1	6.9	7.9
Uzbekistan	-11.2	-25.2	10.0	8.2	8.5	4.5	-21.8	-10.0	8.5	8.0
Indonesia	4.5	-30.9	-10.8	7.5	14.0	12.2	-10.5	-7.4	8.1	9.0
Malaysia	1.4	-26.5	10.0	12.6	13.0	1.2	-7.5	10.1	8.0	8.0
Philippines	14.0	-18.8	4.1	14.0	16.0	22.8	16.9	18.8	14.0	14.0
Thailand	-13.4	-33.8	17.7	16.5	17.0	3.8	-6.8	7.4	7.0	8.0
Bangladesh	3.2	5.1	6.6	7.0	7.0	13.3	17.1	2.8	7.0	12.0
India	4.6	0.9	9.0	7.0	8.0	4.5	-3.9	10.0	4.5	5.0
Nepal	21.7	-12.4	-10.5	15.0	15.0	10.2	11.9	20.3	10.0	12.0
Pakistan	-6.4	-8.4	-6.7	9.5	9.0	-2.6	4.2	-10.7	8.0	9.0
Sri Lanka	7.8	0.4	0.1	14.0	16.0	13.3	3.4	-4.1	10.0	15.0
Fiji	-2.5	-25.3	13.9	--	--	-18.9	-26.6	26.5	--	--
Papua New Guinea	-2.0	-30.2	10.4	15.2	--	-15.1	-20.1	10.1	-5.0	--
Samoa	0.6	3.1	--	--	--	44.3	39.5	--	--	--
Solomon Islands	22.6	-13.4	-13.0	--	--	-3.1	-9.3	--	--	--
Vanuatu	-2.6	-3.5	--	--	--	17.0	-4.4	--	--	--

Source: Asian Development Bank, *Asian Development Outlook 2000* (Manila, ADB).

Note: * Projections.

Table 35. Domestic saving, capital formation and resource gap

(Percentage of GDP)

Economy	Gross domestic saving			Gross capital formation			Resource gap		
	1980	1990	1999	1980	1990	1999	1980	1990	1999
Newly industrialized economies									
Hong Kong, China	33.5	35.4	29.9	35.4	27.1	25.4	1.9	-8.4	-4.6
Republic of Korea	23.8	37.2	34.2	31.7	37.7	26.8	7.9	0.5	-7.3
Singapore	38.8	43.4	49.9	46.3	36.6	32.8	7.5	-6.8	-17.1
Taiwan Province of China	32.6	28.1	33.8	33.8	23.1	24.3	1.2	-5.0	-1.8
South-East Asia									
Cambodia	--	2.3	7.3	--	8.3	18.4	--	6.0	11.1
Indonesia	29.2	32.3	19.5	20.9	30.7	11.6	-8.3	-1.5	7.9
Lao People's Democratic Republic	--	--	--	--	--	--	--	--	--
Malaysia	32.9	34.4	47.0	30.4	32.4	22.3	-2.5	-2.0	-24.7
Myanmar	17.7	11.7	10.0	21.5	13.4	10.5	3.8	1.7	0.5
Philippines	26.6	18.7	14.9	29.1	24.2	18.6	2.5	5.5	3.7
Thailand	22.3	34.3	32.8	29.1	41.1	20.7	6.8	7.1	-12.2
Viet Nam	--	2.9	24.6	--	12.6	27.3	--	9.7	2.7
South Asia									
Bangladesh	2.2	12.9	17.7	14.8	17.1	22.2	12.6	4.2	4.5
Bhutan	7.9	31.9	37.9	31.0	36.1	47.3	23.1	4.2	9.4
India	18.2	23.6	22.3	20.9	25.2	21.8	2.7	1.6	-0.5
Maldives	4.6	34.4	47.0	30.4	32.4	22.3	-2.5	-2.0	-24.7
Nepal	11.1	7.9	13.3	18.3	18.4	20.2	7.2	10.6	6.9
Pakistan	7.8	13.5	13.6	18.5	18.9	15.0	10.7	5.5	1.4
Sri Lanka	12.0	13.2	19.8	34.0	21.2	27.2	22.0	8.0	7.3
China and Mongolia									
China	34.1	38.7	39.0	35.2	34.7	38.3	1.1	-4.0	-0.7
Mongolia	15.7	8.0	--	48.5	34.3	--	32.8	26.3	--
Central Asian economies									
Kazakhstan	14.9	12.0	23.7	30.1	35.0	17.6	15.2	23.0	-6.1
Kyrgyzstan	--	3.7	47.0	30.4	32.4	12.4	--	20.6	19.4
Tajikistan	--	--	32.8	29.1	--	--	--	--	--
Uzbekistan	--	13.2	15.8	--	32.2	15.3	--	19.0	-0.5
Pacific islands									
Cook Islands	--	--	--	--	--	--	--	--	--
Fiji	25.6	11.1	24.9	31.8	14.1	12.0	6.2	3.0	-12.9
Kiribati	--	--	--	--	--	--	--	--	--
Marshall Islands	--	--	--	--	--	--	--	--	--
Micronesia (Federated States of)	--	--	--	--	--	--	--	--	--
Papua New Guinea	14.4	16.1	22.4	25.2	24.4	17.7	10.8	8.3	-4.7
Samoa	--	--	--	--	--	--	--	--	--
Solomon Islands	--	--	--	--	--	--	--	--	--
Tonga	-7.6	-10.6	--	30.1	18.5	--	37.7	29.1	--
Tuvalu	--	--	--	--	--	--	--	--	--
Vanuatu	--	8.8	--	--	--	--	--	--	--

Source: Asian Development Bank, Statistics and Data Systems Division. Available at <*www.adb.org/Documents/EDRC/Statistics/rt_11.pdf* >.