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INSERTING LOCAL INDUSTRIES INTO GLOBAL VALUE CHAINS AND GLOBAL PRODUCTION NETWORKS:

Opportunities and Challenges for Upgrading

With a focus on Asia

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

economy environment employment

Inserting Local Industries into Global Value Chains and Global Production Networks: Opportunities and Challenges for Upgrading

With a focus on Asia, China's rising competitiveness and the phasing out of the Multi-Fibre Arrangements

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
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Abstract

Rapid technological advancements make fragmenting of activities in all stages of a production value chain increasingly possible. Some segmented activities can be performed in different locations worldwide and reintegrated again into global value chains and global production networks. The paper examines how the spreading of these production systems can create opportunities for developing country producers to upgrade their technological and industrial capabilities and to integrate into the global economy. Linking to global value chains can provide better access to markets and to knowledge of leading players. For developing country producers it is important to enter global value chains, but they should do so in a way allowing for rapid innovation and learning–a 'fast track' strategy. For some developing countries, the key challenge of this fast track, of building technological and production capabilities, is to avoid being locked into a race to the bottom, where competitiveness is based on lowering wages, disregarding labour and environmental standards, and avoiding taxation. That kind of strategy is incompatible with sustained growth.

The fast track approach of building industrial capabilities starts with an in-depth analysis of the relative strengths of domestic industries and key structural factors, and the various options for linking to domestic and foreign sources of technology and knowledge. Leveraging productivity gains from this approach assumes strategic decisions on the choice of needed technology and on the specific means of knowledge acquisition. What is crucial for such a strategy to work is to address a variety of issues related to mechanisms of learning and mastery.

The paper then focuses on Asian countries' experience with leveraging domestic and foreign resources through the active participation in global value chains and production networks; on the impact of China's rising competitiveness; its accession to the World Trade Organization, and the impact of the Agreement on Textile and Clothing (ATC) implementation on Asian and other developing countries. It concludes with industrial policies and with the core recommendations for other, less successful Asian economies.

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Abbreviations

AGOA	African Growth and Opportunity Act
ASEAN	Association of South-East Asian Nations
ATC	Agreement on Textile and Clothing
CIP	Competitive Industrial Performance
DDA	Doha Development Agenda
EU	European Union
EBA	Everything But Arms
FDI	foreign direct investment
GATT	General Agreement on Tariffs and Trade
GTAP	Global Trade Analysis Project
GDP	gross domestic product
GSP	Generalized Systems of Preferences
GLC	global logistics contracting
GPNs	global production networks
GVCs	global value chains
LAC	Latin American countries
LDCs	least developed countries
LDBC	Least Developed Beneficiary Country (under AGOA)
MENA	Middle East and North Africa
MFA	Multi-Fibre Arrangements
MVA	manufacturing value added
NAFTA	North American Free Trade Agreement
NIEs	Newly Industrializing Economies
NTBs	non-tariff barriers
OBM	own brand manufacturing
OEM	original equipment manufacturing
ODM	own design and manufacture
PDAs	Personal Digital Assistants
PSB	Productivity and Standards Board
R&D	research and development
SSA	Sub-Saharan Africa
TNCs	transnational corporations
TBTs	technical barriers to trade
T&C	textile and clothing
WTO	World Trade Organization
WAP	Wireless Application Protocol phones

I. New emerging business framework of global value chains and global production networks

Opportunities and challenges

Intensifying globalization of production and trade is causing growing competitive pressures for developing country producers. Accelerated technological advancements and trade and investment liberalization increasingly make fragmenting of activities in all stages of a production value chain possible. Some of these segmented activities can be performed in various locations across the globe and reintegrated again through production systems of global value chains (GVCs) and global production networks (GPNs). A group of leading transnational corporations (TNCs) are playing a key role in organizing and controlling these production systems, benefiting from location differences in costs, infrastructure, capabilities in manufacturing, marketing and logistic, and in trade and investment regimes. This is having far-reaching effects on competitiveness, cross-national transfer of new technology, ideas, skills, knowledge and learning, and potentially offers greater opportunities for reaching welfare gains. But it also brings new challenges.

Participating in the GVCs and GPNs broadens the scope for getting gains from an open trade and investment regime, and thus diminishes pressures for protectionism. It can help developing country producers to enter foreign markets, earn more foreign currencies, diversify their exports, and most importantly to get new skills, knowledge and technology—all considered as key factors for productivity enhancement and growth. Latecomer firms from developing countries can exploit the advantage of their late arrival to tap into new technologies, rather than having to reproduce the entire previous technological trajectory.[1] They can accelerate their uptake and learning efforts, engaging in

[1]Alexander Gerschenkron, Russian historian, introduced a term "latecomers" to explain patterns of 19th-century industrialization in Europe. Gerschenkron argued that the industrialization strategies of latecomer nations, like Germany and Russia, were different from those followed by first movers, like the United Kingdom and France. The latecomers suffered from the disadvantages of not having the industrial base of the first movers; and of not having advanced capital markets and financial institutions. Gerschenkron (1962) argued that the latecomers were able to acquire these features rapidly once equipped with a national industrialization strategy, by bypassing earlier steps. Germany, for example, was able to establish technical excellence in the new science-based industries, like dyestuffs, where its established technical institutes staffed with scientific faculty gave them a distinct advantage over an early mover like the United Kingdom with its patchwork training arrangements.

collective, purposive and directed efforts to use the relationships with foreign partners in GVCs and GPNs to get the right technology and knowledge, and to learn and create new capabilities, capturing the externalities of collective learning. Through using various forms of collaborative processes and intermediary institutions' services to help with the process, they can bypass some of the organizational inertia that holds back their more established competitors.

This route of integrating in the global economy exposes a host country's macroeconomic and business conditions to the stronger competitive pressures, stimulating a country to make better physical infrastructure and utilities, and to create a more business-friendly environment. Once a participating country starts reaping the benefits from these opportunities, trade- and investment distortion policy measures become a less attractive option.

Two recent studies underscore the claim that being part of GVCs and GPNs can result in welfare gains for producers and consumers: Feenstra *et al*. (2002) measures the welfare contribution of global buyers in Hong Kong SAR by comparing two price indexes of the final products at the destination countries' markets: one includes costs of direct outsourcing to China for processing and for re-exporting ("direct index"), while the other includes also the costs of employing trading houses services in Hong-Kong ("inclusive value index"). When these two indices are compared, the "inclusive value index" is on average (across years and products) 16 per cent lower than the "direct index", showing the efficiency gains accruing to firms using the services of trading houses in Hong-Kong. These efficiency gains stemming from saving in transaction and information-search cost, which would otherwise arise when directly dealing with firms in China, further translate into welfare gains for all participants: lower prices for end-consumers and higher returns for producers.

The other study by Moran (2002) compares gains solely from trade liberalization, with the gains from trade and investment liberalization taken together (which have underpinned the appearance of GVCs and GPNs). The study shows that gains from the second are 10 to 20 times higher than the conventional gains resulting from the first. The study concludes that the production globalization through spreading of GVCs and GPNs stimulates industrial specialization according to dynamic comparative advantages. The examples of Costa Rica and economies in East Asia are used to support this conclusion.

Two decades ago, the export structure of Costa Rica was strongly dependent on two products, coffee and bananas. Ten years ago, with the trade liberalization effects, shoe and textiles also became its export products. Today, with the spreading of GVCs and the sophisticated value-chain management tools, Costa Rica is also involved in producing semiconductors, medical equipment, auto-parts and other electronic goods. The country has become the most export-intensive economy in Latin America, replacing Chile. Costa Rica's share of exports in gross domestic product (GDP) was 43 per cent in 2001—the highest in the region. Its quality of export structure also improved: its share of medium- and high-tech sectors in manufacturing value added (MVA) rose from 21 per cent in 1980; 24 per cent in 1990; and 29 per cent in 2000 (UNIDO, 2004, pp. 194-195). Similar

improvements in the quality of export structure have experienced economies in East Asia. These shares increases were for the period 1980, 1990 and 2001: in Malaysia 35 to 52 and 65 per cent; in Thailand, 21, 24 and 43 per cent; and in China, 48, 52 and 57 per cent. China is now able to produce goods that used to be made by Taiwan Province of China, Republic of Korea and Hong Kong SAR, while these economies are more engaged in higher value-added segments of value chains.

But the emerging global business scene does also present new challenges for developing countries and their enterprises. Intensified competition is forcing prices down and production and technological capabilities up, making smaller suppliers that do not possess the capabilities and competitive advantages in price, quality, quantity and delivery, which modern production systems call for, extremely vulnerable. Even successful enterprises may find it difficult to sustain competitiveness as the wages in their countries rise and market conditions change. Thus, a diverse picture of the winners and losers is emerging in today's global economy. Some regions and developing economies have succeeded to leverage the opportunities emerging from this new business environment. They have reached higher export growth and global market shares, and have upgraded their industrial and technological capabilities. These encouraging examples include Asia at the regional level, and Singapore, Hong Kong SAR, Republic of Korea, China, Taiwan Province of China, Malaysia, Indonesia and Thailand, at the country level. Other regions and developing countries have not been doing well in this regard.

This paper discusses opportunities and challenges for industrial upgrading through participating in the global economy using the GVC and GPN approach. Part II deals with the value chain and production network analyses. Part III focuses on Asian countries' experience with leveraging domestic and foreign resources through the active participation in GVCs and GPNs, and on the impact of China's rising competitiveness, its accession to the World Trade Organization (WTO) and the impact of WTO Agreement on Textile and Clothing (ATC) implementation on Asian and other developing countries. In Part IV the paper concludes with industrial policies and with the core recommendations for other, less successful Asian economies.

II. Value chain and production network analysis

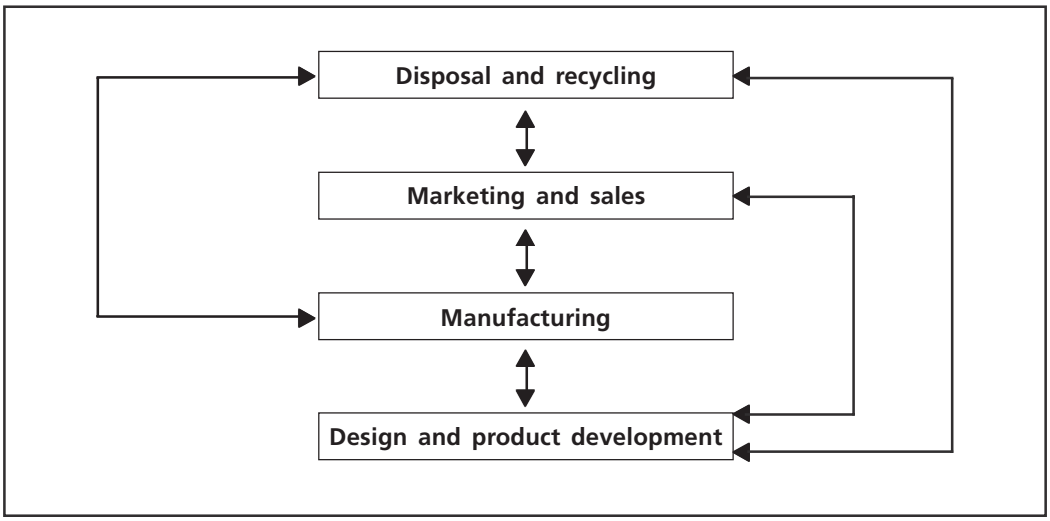
The GVC analysis focuses on the strategic global dispersion of different value added activities in a value chain and on the possibilities for technological and industrial upgrading for local enterprises from the positioning in product specific value chains. GPN analyses complements the GVC analyses in that it focuses on how a flagship firm's production network is organized; how it is dispersed across firms and borders, and how technology is transferred among network participants. Local enterprises need to possess high technological capabilities to be included by a flagship firm in its GPN. Once selected, participants can benefit from the network capability formation and development, which is the core of the strategy adopted by a flagship firm to raise the competitiveness of its network.

What are value chains and production networks?

Value chains capture a sequence of related and dependent activities that are needed to bring a product or service from conception, through the different phases of production, to delivery to final consumers and after sales services, and finally to disposal or recycling (see figure 1 for a simple value chain). Thus, value chains are complex entities where production is only one of several value-added links in the chain. They may include a range of related and dependent activities within each link of a chain, and between different chains. Intermediary producers in one value chain may feed into several other value chains.

Value chains can span enterprises of a local economy, a sub-national regional economy, the entire domestic economy, a supra-national regional economy, and the global economy. The structure and the dynamism of the market a value chain serves are important factors, as they influence innovation possibilities of enterprises in value chains. Usually low-income, price-elastic markets tend to stimulate innovation on processes, while high-income markets tend to stimulate product and functional innovation. These issues will be detailed further.

Figure 1. A simple value chain



The GVC concept is increasingly complemented by that of GPNs of specialized independent enterprises, capturing complex relationships and interrelations between firms that are of systemic nature.[2] The production network concept reflects the processes of accelerated fragmentation in knowledge-intensive activities in some value chains. For instance, in product design and development, product technology is becoming increasingly modularized. Modularization of technological knowledge enables that technological knowledge to adopt the characteristics of a standard commodity, allowing design and other knowledge-intensive activities to be separated from the whole value chain system and to be performed in different geographical locations (Ernst and Lüthje, 2003). Besides high technological intensity and fragmentation possibilities in some sectors, higher value to weight of products is also used as an explanatory factor of why production networks appear more in one sector than others, and why in some countries or regions but not in others.[3]

Concerning the GPN governance and its relations to GVC, GPN participants at different hierarchical layers are under the leadership of one flagship firm. Growth, strategic direction and network position of participants in GPN depend markedly on the flagship company strategy.[4] A company specific GPN can participate in a variety of GVCs as illustrated by figure 2. For example, Solectron is engaging in telecommunication equipment, automotive electronics and personal computers' value chains.[5] Production networks may compete with each other in a product-specific value chain, but they may also cooperate (for example, telecommunication equipment such as a mobile phone value chain includes Solectron and Flextronics box 1).

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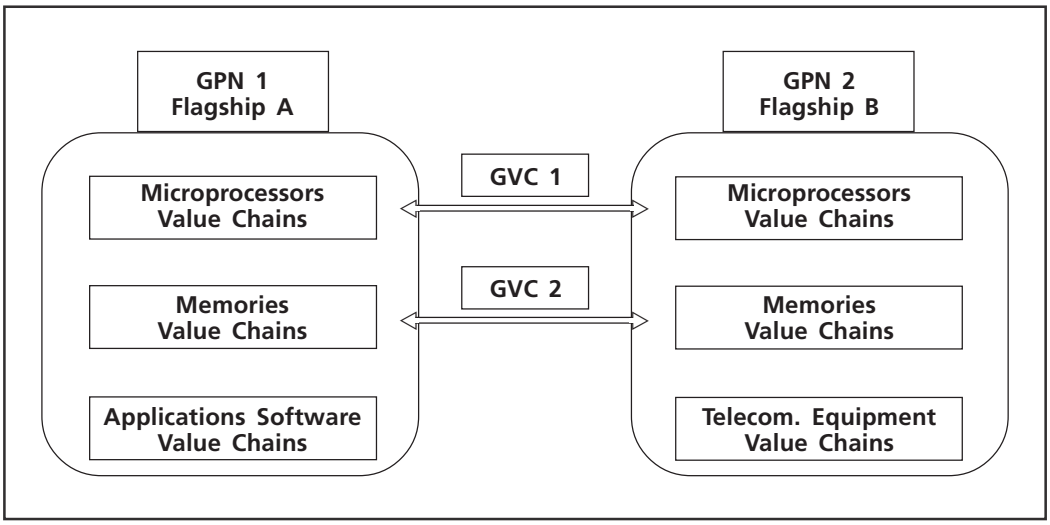
[2]Actors in the system have a role to play and their respective actions, directly or indirectly, relate to and impact on other actors (for example, changes in prices, products, types of services, efficiency and technology all have an effect on a market and on competitors).

[3]See for instance, Lall *et.al* (2004b).

[4]In the literature, GPN is usually related to a specific flagship firm (e.g. Solectron GPN, see *http://www.solectron.com/*) while a GVC is related to a specific product (e.g. microprocessors GVC). A product specific GVC can consist of a variety of GPNs.

[5]See more in Ernst, D. (2001).

Figure 2. Global value chains and production networks



Box 1. GPNs and GVCs

Global production network (GPNs) consist of the flagship firm and local suppliers. The flagship firm defines the strategy and organizational policy of the network. There are two types of flagships: brand leaders, such as IBM, Compaq or Dell that allow suppliers to be independent but demand high performance from them. Brand leaders pursue cost reduction, product differentiation and time-to-market strategies through outsourcing volume and low-margin manufacturing and related support services. The second type of flagships are contract manufacturers, for instance Solectron or Flextronics, which set up their own production networks and create an integrated supply chain, available to the brand leaders. A firm-led GPN can participate in different value chains and a GVC can comprise two or more production networks.

Solectron, the world's largest electronics service company, illustrates a global production network concept. Customers of Solectron span five continents in more than 20 countries. Solectron supply facilities are where the customers' requirements can be competitively met. The Solectron's GPN consists of 53 branches dispersed in the Americas, Asia/Pacific and Europe. The Solectron's GPN participates in various value chains of electronic products like automotive, communications, computing and storage, consumer products, industrial and medical. In parallel, other firm-specific GPNs also take part in the value chains where Solectron is involved. For instance, Flextronics' GPN participates in at least five of those value chains, in communications, computing, consumer products and medical. A GPN flagship firm can be dominant in a product-specific value chain, such as consumer products of cellular handsets or Personal Digital Assistants (PDAs), while having little influence on the value chain governance. This is the case when the firm itself is a part of a larger value chain, supplying components for production of final goods. For instance, Solectron provides car audio and navigation systems, anti-lock brakes (ABS) and airbag control modules with little influence on the larger automotive value chain.

Sources: Ernst, Dieter and Linsu Kim (2002); Sun Microsystems (2002); http://www.visiprise.com/pdf/sun_solectron_case_study.pdf.; www.solectron.com [8 November, 2004]; www.flextronics.com [8 November, 2004].

The value chain and production network analysis as a tool for strategic policy-making

At the company level, the value chain and production network analysis are becoming crucial strategic tools for gaining competitive advantage. Value chain management binds different activities, from planning to development, buying, producing and to selling, connecting them into integrated inter-company relationships that enable companies to target big markets and get large benefits. This management tool helps to better understand the need for synchronized products, information, processes and cash flow, within the value chain. Central to this new business strategy is to create trust-based relationships, between and in different links in the chain, and between producers and immediate customers and suppliers.[6]

At the country level, value chain analysis can also help to better understand the nature and determinants of a country's productive and technological capabilities and its competitive performances. As products are brought to markets through a combination of activities, creating value is not confined only to production. So, innovation can involve improving capabilities in production; developing new capabilities outside production (design and marketing skills); diversifying customers and market destinations; and developing the capacity to introduce new products. By focusing on all links in the chain and on all activities in each link of a value chain, it becomes easier to distinguish activities subject to raising or decreasing returns, and to understand the nature and dynamics of innovation. This analysis can help policy makers to formulate better policies and make proper decisions.[7]

Equally important is to understand the governance of a specific value chain. Since more international trade is taking place between formally independent companies in networks, rather than through arm's-length transactions or intra-firm trade, and since the lead firms in GVCs and GPNs are key actors in managing these global production systems and global trade, they can influence the innovation prospects of the participating firms. Therefore one needs to understand the structure of a specific value chain; to identify the characteristics of its leading firms, and the ways they might wish to incorporate developing country producers in these value chains. The lead firms in GVC range from those TNCs who are producers, but source inputs from suppliers around the globe, to those who are retailers and branded marketers or manufacturers and do not produce goods, but play a key role in organizing production at different locations scattered around the world.

The advantage of the GVC approach is that producers can gain from the changing division of labour within a chain. Firms can seek involvement at their technological competence level and can leverage their involvement in the GVCs to reach higher competence. In Mexico, garment producers were vertically integrated in supplier networks that did not offer much scope for skills enhancement and innovation. With the North American Free

[6]See more in Taninecz, G. (2000); Travis L. (2000); and Royal W. (2000).

[7]Morris M. (2003).

Trade Agreement (NAFTA), however, buyer groups from the United States started to create alternative value chains and networks that offered Mexican firms more scope for expanding their functional responsibilities (from assembly to "full package" supply). NAFTA has allowed Mexican firms to engage in full-package production but apparently that was valid only for certain sub-national regions in Mexico (Gereffi, *et.al* 2002, pp. 46, 211, 251, 262). But raising participation of China with its abundant labour in global economy has challenged the Mexican producers" prospects. The Mexican annual manufacturing productivity growth of 8 per cent in 1994 fell below 3 per cent in 2002 (Authers and Silver, 2003). Mexico faces a number of constraints related to its social, political and economic infrastructure. Unlike East Asia, Mexico is still lacking capabilities in coordination of all supply chain activities to be able to supply finished products to buyers. Mexico lacks the services of trading intermediaries that broker full-package production. Marketing and design are still under control of the United States buyers. Many Mexican firms (except knitwear producers, who have high technological levels and have improved their organization significantly) lack the technology and capacity to engage in exports or even to compete successfully on the domestic market. This suggests that leveraging strategies have to be taken more seriously and not only by the frontline enterprises, for which "upgrading" beyond the low-labour cost segment of the chains causes its survival, but also by other enterprises, institutions and organizations, and by governments at different levels. To these issues we will return in parts three and four of this paper.

As outlined above, understanding value chain organization is vital as it throws light on three key issues: What type of work is allocated to developing countries and firms in the chain and will such work sustain their jobs and incomes? Does value chain allow upgrading by developing country producers? What are the strategies and policies that can help developing countries to successfully leverage their participation in GVCs and GPNs to get productivity enhancement and welfare gains?

Innovation in GVCs

Participation in GVCs and GPNs may induce the firm to improve its efficiency in individual activities; to change the mix of activities (within its link and perhaps to expand into other links); or to try to innovate by moving into another value chain (see figure 3). Therefore, four kinds of innovations can be distinguished:[8]

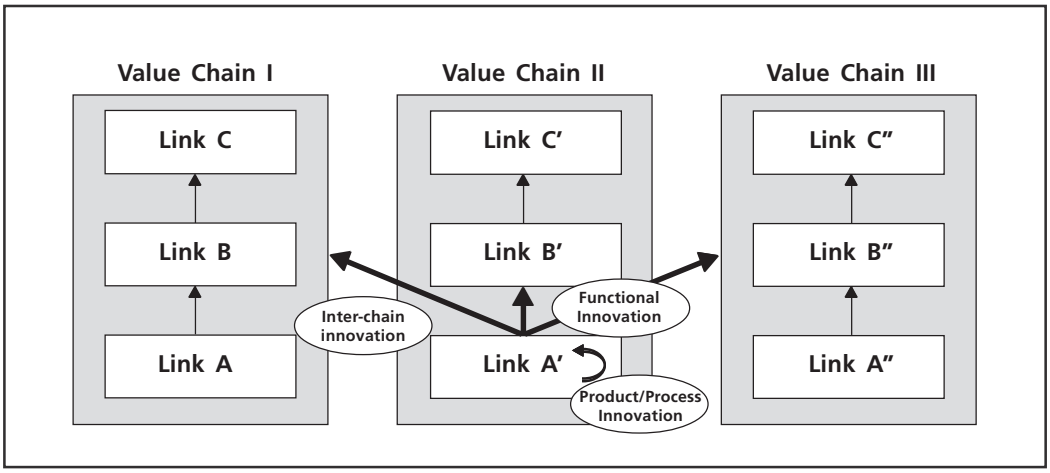
- **Process innovation** or improving the efficiency of internal processes, such that these are significantly better than those of rivals, in individual links in the chain (for example cutting the cost of inventories, lower scrap) and between the links in the chain (for example, more frequent, smaller and more timely deliveries).

- **Product innovation** or improving old products through quality and price performance and through time to market, or differentiating by introducing new products faster than rivals. This involves changing new product development processes in individual links in the value chain and in the relationship between different chain links.

[8]See UNIDO (2003).

- **Functional innovation** implies raising value added by changing the mix of activities conducted in the firm.
- **Inter-chain innovation** assumes moving to a new more profitable value chain, where higher rents can be captured (for example, Taiwan Province of China firms moved from the manufacture of transistor radios to calculators, to TVs, to computer monitors, to laptops and now to Wireless Application Protocol phones (WAP).

Figure 3. Innovation trajectories



Innovating in global value chains moves along two pathways: market expansion and technological capabilities. The own brand manufacturing (OBM), which is usually the most profitable segment of a GVC, calls for market and technological competencies (see figure 4). **Path A** represents a trajectory that starts with process innovation of original equipment manufacturing (OEM), and then develops, exercising market expansion through global logistics contracting (GLC), providing the product at many locations, to reach OBM as final point[9].

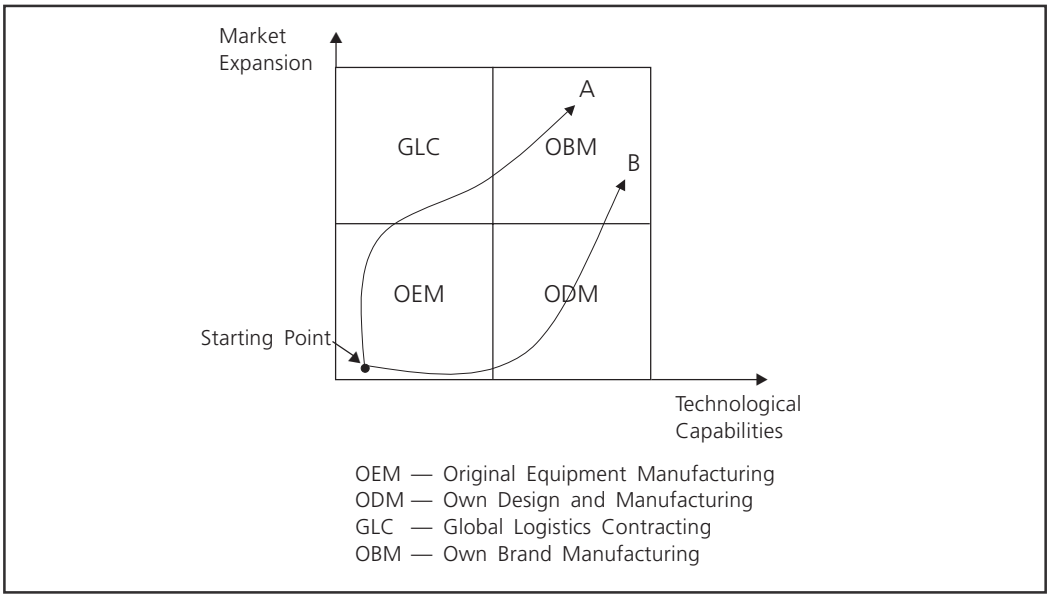
Path B, by contrast, focuses on capability enhancement through expanding functional responsibilities, from OEM to including some responsibility for Own Design and Manufacture (ODM), driving the firm after that to market its own designs under its own brand and reach the OBM position. This is the path followed by the East Asian electronics firms (box 2). They have moved from being the OEM, or full-package suppliers and producing entirely according to the specifications of contracting firms, to being the ODM.[10] And, finally to become an OBM, a fully-fledged firm that produces its own line of branded products.[11]

[9]The essence of global logistics contracting (GLC), which was initiated by the East Asian firms in the 1970s and 1980s, is that global buyers place their orders with the manufacturers they have sourced from in the past; those manufacturers then outsource some or all of the requested production to affiliated offshore factories in low-wage countries (e.g. China and Indonesia). The triangle is completed when the finished goods are shipped directly to the overseas buyer. This triangle manufacturing changes the status of OEM manufacturers from established suppliers for retailers and designers in developed countries to middlemen with strong capabilities in logistics and management and that can include as many as 50 to 60 exporting countries in the buyer-driven value chains.

[10]Full package supply assumes carrying out some or all of the product design, according to a general design layout supplied by the foreign buyer, and subsequently selling goods under the buyers' brand name. This creates the opportunity for latecomer firms to gain more value added while avoiding the risk associated with the launching of its own-brand products.

[11]In the early stages, ODM applied mainly to incremental changes to existing products rather than to new products that were developed by the leading firms based on R&D.

Figure 4. Leverage strategies



Source: Mathews, J. A. and D.S. Cho (2000).

Box 2. Asian experiences with leveraging resources through GVCs and GPNs

Through linking to the foreign partners in GVCs and GPNs, East Asian firms succeeded:

1. In innovating in the buyer-driven value chains and in moving from assembly to OEM and OBM. Taiwan Province of China, Hong Kong SAR, the Republic of Korea and Singapore have adopted "Triangle Manufacturing" strategy. They take orders from the global buyers and shift part or all requested production to factories (wholly owned, joint ventures or independent) in low-wage countries such as China and Indonesia. The triangle is closed when the finished goods are shipped to buyers. This strategy has eased shift to higher value-added activities in the apparel industry in the 1970s and 1980s by East Asian countries and China.

Examples:

- ❑ Fung Brothers Group, the leading OEM supplier of the Liz Claiborne in the 1970s and 1980s, succeeded in the shift to OBM, and controlling the clothing chain brand Episode.
- ❑ Giordano, Hong Kong's most famous clothing brand, moved from controlling manufacturing to setting and controlling retailing.

2. To move from being an OEM, to being an ODM, and finally to become an OBM, a fully-fledged firm that produces its own line of branded products.

Examples:

- ❑ Asian firms in electronic but also in garments.

3. To move from buyer- to producer-driven value chains. The East Asian newly industrializing economies (NIEs) have moved from the buyer-driven chains to medium- and high-tech producer-driven value chains, and have upgraded in those value chains (for instance automobiles, electronics and telecommunications).

Examples:

- ❑ The Republic of Korea is the most advanced of the East Asian NIEs in OBM production. Its brands include Hyundai in automobile, Samsung in electronic products, Samsung and Goldstar in household appliances.
- ❑ Taiwan Province of China pursued the OBM production strategy in computers, bicycles, and sporting equipment.

Two types of value chains

Two types of global value chains are distinguished in the literature: buyer-driven and producer-driven value chains. The distinction is important because the dynamics of the relationships and inter-reactions they generate are different in each case. Even more to the point, the opportunities to leverage new knowledge and capabilities from these arrangements differ as well. Usually, "easy" technologies can give rise to buyer-driven chains, while "difficult" technologies with close coordination needs, proprietary technologies and the like, to producer-driven chains.

In the ***buyer-driven value chains***, large buyers with core competencies in branding and marketing are the driving actors in setting up these value chains. They increasingly organize, coordinate and control the production, designing and marketing activities to target consumer markets in developed and developing countries, and in the transition economies. These chains are typical for labour-intensive industries and are highly relevant to developing countries (for instance, agro-food industries, textiles, garments, footwear, toys, furniture, and the like). For the producers of branded products (Nestle in food value chain), it is of the highest importance to capture much value added from the R&D on product development and from marketing. So, they are keen to maintain the value of the brand and to avoid copying, through protecting intellectual property. Their strong market position is the result of the global brands and brands for a specific market or region.

In the ***producer-driven value chains,*** key producers in the chain control vital technologies, which are of crucial importance for positioning in the final product market. They coordinate these value chains and take responsibility for helping the efficiency efforts of their suppliers and their customers. These chains are typical for medium- and high-tech industries, like automobiles, electronics, telecommunications, and the like.

Developing country producers tend to be part of labour-intensive, buyer-driven chains with the exceptions of the East Asian newly industrializing economies (NIEs) that have moved from buyer- to producer-driven chains (such as automobiles, electronics and telecommunications).

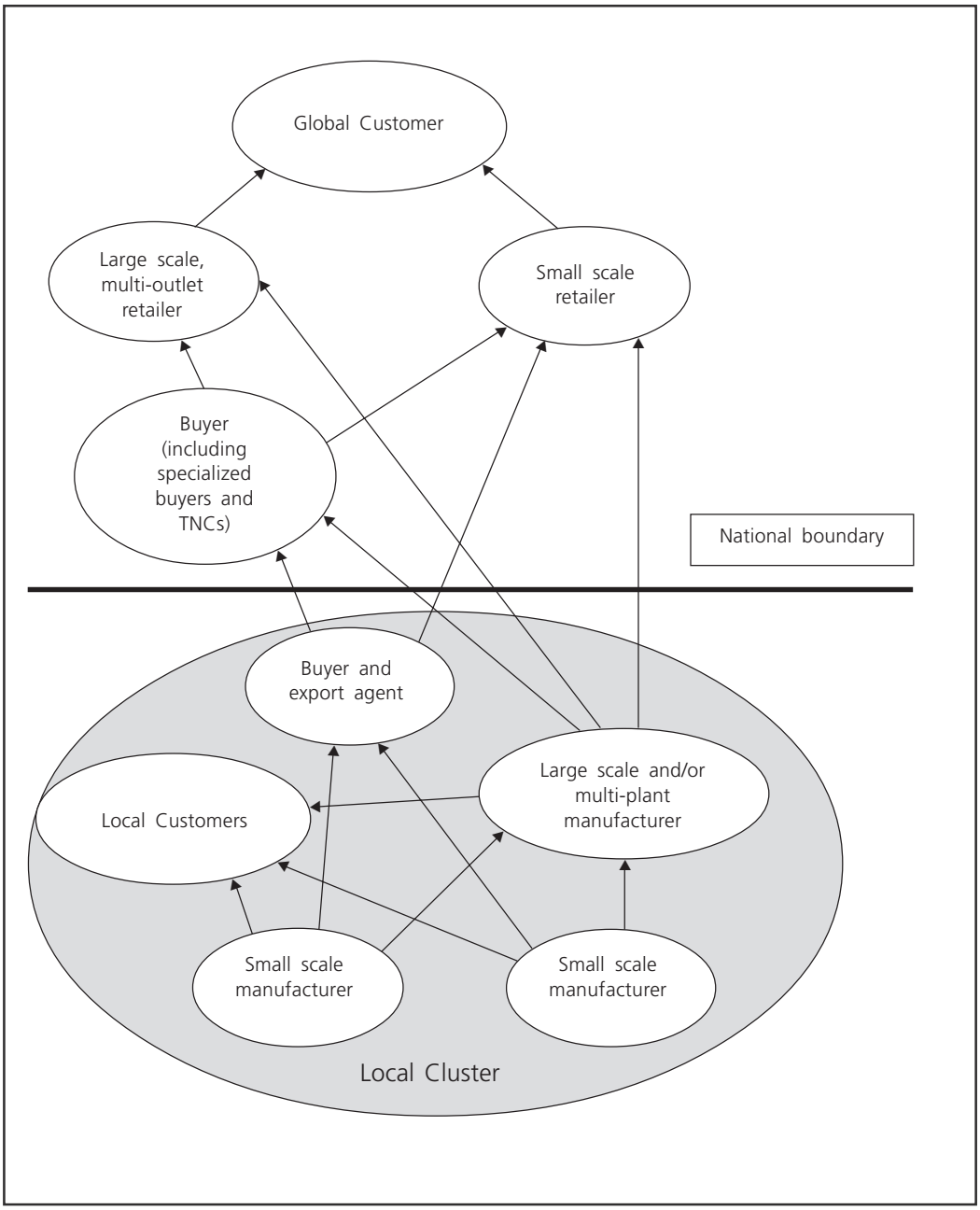
Access to chains' lead firms and the role of global buyers

The challenge for developing country producers is to access the chains' lead firms, either directly as a first-tier supplier (or subaltern), or indirectly as a second-tier supplier (see box 3).[12] The central role of global buyers is portrayed in figure 5. The global buyers are the intermediaries between global consumers and the local manufacturers, thereby inserting local industries into global value chains**.** Figure 5 shows possible linkages. For

[12]See also Kaplinsky and Memedovic, 2003, UNIDO.

many Asian firms, foreign and local buyers were a key entry point into GVCs; an essential source of skills, knowledge and new technology; and an important means for marketing. Many Asian firms at first sold their goods to the large buying houses from Japan (e.g. Mitsubishi and Mitsui) and the United States (e.g. J.C. Penney and Macy's). The global buyers enabled local firms to get the credit needed to expand their production. They also supplied technology in various forms (like blueprints, specifications); information on competing goods; production techniques, and guidance on design and quality.

Figure 5. Linking local producers to global buyers



Source: Kaplinsky R. and J. Readman (2000).

Box 3. Three categories of buyers of apparel value chain

In the global apparel chain, for instance, three categories of buyers of apparel value chain can be identified: retailers, branded marketers and branded manufacturers.[13] Today's technological changes and superior information flows give retailers day-to-day market knowledge on consumer needs. This is allowing retailers to demand from their suppliers better inventory management, faster responses and more frequent deliveries. Technological changes also make it easier for larger retailers to directly control suppliers, making them use information technology for storing and monitoring sales data; to adapt various standards (social, environmental, health and safety) and product labelling; to apply new technologies for using materials; and the like. As each type of buyer in the apparel value chain has become more active in offshore sourcing, the competition between retailers, marketers and manufacturers has intensified, blurring the traditional boundaries between these firms and realigning interests in the chain.

Organizers of production on behalf of ***retailers*** in the South are increasingly powerful trade intermediaries or first-tier suppliers in East Asia. They carry out low-profit activities transferred from lead firms. Trade intermediaries are independent companies matching domestic manufacturers and foreign buyers. They export, import, and engage in third country trading (supplier, buyer and broker all being from different countries) of goods and services. Logistic capabilities are important for these firms but also the ability to play the management-coordinating role. In the current expansion of globalization, with strong competition on international and domestic markets, these trading intermediaries and their knowledge about local supply sources and foreign markets are gaining importance and influence. In 1994, trading services' share of Hong Kong SAR GDP was 20 per cent, while that of manufacturing was only 7 per cent (over the period 1988-1998, on average 53 per cent of Chinese exports were re-exported through Hong-Kong). Trading houses controlled around 75 per cent of Japan's imports and almost 50 per cent of its exports (in 1990). To meet customers' needs, a trading house can customize its supply chains. A good example is Li & Fung, which has 69 offices in 40 countries and territories (48 offices in 32 countries and territories in 2001). The whole supply chain is synchronized to satisfy the exact needs of the buyer (product, price and time).

Branded marketers are well known as manufacturers without factories as they are not engaged in production. Instead, they just design and market their goods. Examples include athletic footwear companies (Nike, Adidas and Puma) and fashion-oriented apparel companies (The Gap and Liz Claiborne). As pioneers in global sourcing, they provided knowledge, which later allowed overseas suppliers to upgrade in the apparel value chain. To deal with new forms of competition, branded marketers are outsourcing some support works to contractors. They are instructing contractors where to get needed components, and how to cut their own purchase and redistribution activities. They are shrinking their supply chains, using fewer but more capable manufacturers and are also adopting more stringent vendor certification systems to improve performance.

Branded manufacturers are offshore suppliers, usually in neighbouring countries, with trade agreements that allow goods assembled offshore to be re-imported with a tariff charged only on the value added by foreign labour. Leading TNCs supply intermediate inputs to the extensive networks of offshore suppliers. This international subcontracting system exists worldwide.[14] The trend for the branded manufacturers is less engagement in production and more in marketing through capitalizing on brand names and retail outlets.

Source: Gereffi and Memedovic, 2003, UNIDO,

[13]The retailers account for 50 per cent of imports; branded marketers and branded manufacturers for 20 per cent each; with various others accounting for the rest in the 1980s, in Gereffi and Memedovic, 2003, UNIDO.

[14]It is called the 807/9802 programs or "production sharing" in the United States (USITC 1997), where the sourcing networks of United States manufacturers are predominantly in Mexico, Central America and the Caribbean, because of low wages and proximity to the market.

Leveraging channels

Linkages to foreign partners in GVCs can take different forms. They can range from traditional forms of foreign direct investment (FDI) with investments in majority or wholly foreign-owned subsidiaries, to new forms of investment in which foreign investors do not have interests in control trough equity participation, but involve at least one element of investment (joint ventures, subcontracting, co-production, licensing agreements, strategic partnerships for technology); to expatriates returning home; and to direct exporting and one-off transactions. The TNC motives to enter these arrangements with local developing country producers may vary by value chain type, by activities in the value chain, and may also be influenced by the trade regime of the main markets these chains are supplying (like Mexico under NAFTA).

Foreign direct investment

Foreign direct investment (FDI) was an important starting point for many producers in East and South-East Asia that led in some cases to joint ventures and OEM. Foreign subsidiaries could act as demonstrators for local producers or could directly help local firms through providing training for technicians, engineers and managers. But, the contribution of FDI was more in the export and job creation and less in generating backward linkages with the rest of the domestic economy.

Joint ventures

In the early stages of Republic of Korea exports, the government permitted local firms such as Hyundai, Daewoo, Lucky Goldstar, and Samsung to form joint ventures with Japanese and United States firms. Samsung Electronics started as a joint venture with Sanyo Electric in 1969. Its first step was to get overseas training, machinery, components, raw materials and foreign management techniques from Sanyo. It started by assembling simple transistor radios and black-and-white televisions under this joint venture and then it diversified into electronics from other industrial areas.

Licensing

Under licensing contracts, local firms pay the right to manufacture goods usually for the local market and TNCs transfer the needed technology for this manufacturing. Usually, licensing requires a higher technological capability from the latecomer than a joint venture, in which a "senior partner" would normally provide the know-how for the local firm to undertake the production.

Subcontracting

Under the subcontracting agreements, TNCs may provide training and engineering support for the local firms, and in return the local firm would produce a component or subsystem, which would then be incorporated into the final equipment by the purchaser. Subcontracting usually takes place in lower-value added products and is mostly oriented towards the export market.

Strategic partnerships

Strategic partnerships for technology are non-equity joint ventures between Asian firms on an equal basis with foreign TNCs. In recent years, this strategy has enabled the largest latecomer firms to improve their position in GVCs by developing new and advanced products and processes jointly with foreign companies. Examples include Samsung with Toshiba to develop flash memory chips; Samsung with Texas Instruments of the United States to produce semiconductors; and Lucky Goldstar of the Republic of Korea with Philips of the Netherlands to produce thin-film transistor/liquid crystal display screens. In these joint ventures, local companies usually provided advanced manufacturing processes' know-how, while foreign partners provided financial capital and access to their basic research facilities at home.

Ways in which TNCs might wish to incorporate developing country producers into GVCs

The relationships between local producers and global lead firms in the value chains can include a whole range of relationships, spanning from arm's-length or market-based relationships to hierarchy. In between, there can be various network type relationships (see box 4).[15]

Leading players do not always prefer to internalize production in their value chains. Where final markets do not need customized inputs, they will prefer to purchase inputs on an arm's-length basis on global markets (as in many primary commodities). But, where market demands more standardized inputs, they often choose long-term relationships with reliable suppliers who meet their standards. When needed, they will help these suppliers to reach the desired standards, but this is only a second-best alternative for the lead firm. It is only when their discrete competencies are involved, or where the transaction costs of helping suppliers are too large, that they will internalize operations in the value chains they control and coordinate. Thus, many GVCs in low technology- and resource-intensive sectors do not involve equity participation by TNCs, and growing competencies in many medium-technology sectors mean that TNCs are increasingly relying on independent turnkey suppliers.

This poses problems for latecomer firms from developing economies that are aiming to follow East Asian experience with entering global markets in low technology-intensive, buyer-driven value chains through wholly foreign-owned subsidiaries. This may have been the effective strategy during the 1970s and 1980s, but in the 1990s growing production competencies in locally owned firms outdated this strategy for many TNCs. If this is the case, developing countries may be further marginalized in the global economy, unless they can autonomously upgrade their industrial sectors. This points to local clusters and innovation systems for reaching systemic efficiency by developing country producers.[16]

[15]Gereffi, *et al.* (2003).

[16]See more on innovation systems in Cooke, P., 2003.

Box 4. Firm relationships in GVCs and GPNs

1. **Arm's-length or market-based relationships** occur when producers and buyers have no personal relationships; thus, trading relationships are essentially impersonal (the world of perfect competition). The export of many primary commodities (like coffee and steel) is an example of this form of incorporation in global markets.

2. **A network-type of relationship** occurs when producers and customers are engaged in a variety of network relationships. This may include modular, relational and captive value chain relations.

   - **Modular relationships** arise when product architecture is modular and technical standards are cutting component variation through unifying component, product, and process specifications; and when suppliers have the competence to supply full packages and modules, which internalizes hard to codify (tacit) information, cuts asset specificity, and thus weakens a buyer's need for direct monitoring and control.

   - **Relational value chain interactions** are complex interactions between buyers and sellers, which often create mutual dependence and the asset specificity. This may be managed through reputation, or family and ethnic ties. Relationships are built-up in time or are based on dispersed family and social groups. Symmetrical-power relationships also belong to this type. They occur when different producers have complementary skills, which they need to share to capture returns. This is a world of cooperation among "equals", often engaging in technological collaboration (for example, in the electronics industry, or in automobiles, where major assemblers jointly produce engines). When product specifications cannot be codified, transactions are complex, and supplier capabilities are high, relational value chain interactions can be expected.

   - **Captive value chain relations** are typical for situations where small suppliers are transactional-dependent on much larger buyers. Suppliers face significant switching costs and are thus "captive". Such networks are characterized by a high monitoring and control by lead firms. The complexity of product specifications is high, but supplier capabilities are low. In this situation, value chain governance will tend toward the captive type. Low supplier competence in the face of complex products and specifications needs much intervention and control from the lead firm, encouraging the build-up of transactional dependence, as lead firms seek to lock-in suppliers, excluding others from reaping the benefits of their efforts. So, the suppliers face significant switching costs and are "captive". Captive suppliers are usually confined to a narrow range of tasks—for example in simple assembly—and are dependent on the lead firm for complementary activities such as design, logistics, component purchasing, and process technology upgrading.

3. **Hierarchical relationships**

   - **Quasi-hierarchical relationships** occur when the two parties are not joined by ownership, but engage in a long-term relationship. One of the parties tends to be dominant, to assume the role of the "governor" and to decide who is incorporated in the chain, and what standards they have to meet. The governor sometimes helps producers to meet these standards and audits the performance of producers.

- **Vertically integrated hierarchies** with explicit coordination refer to the relations between producers in a vertically integrated production chain. Close bonds of ownership influence these relations. It describes a value chain of head offices and wholly foreign-owned subsidiaries, that is, a world of traditional FDI forms. The dominant form of governance is managerial control, flowing from managers to subordinates or from headquarters to subsidiaries and affiliates.

Source: Adapted from Gereffi, G., *et al.* (2003); and Humphrey and Schmitz (2000).

III. The Asian experience

Recent industrial performances of Asia

Indicators of manufacturing and export performances of the UNIDO Scoreboard database show how Asia and its sub-regions have adapted to the new emerging business framework (see annex A for tables and figures). The region's export structure has become more technology intensive, with the shares of medium- and high-technology-intensive sectors rising.[17] Furthermore, the region is gaining market shares in dynamic product markets of high-technology-intensive products, like semiconductors.

East Asia, without China, is now the most industrialized region in the developing world and the engine of the recent industrial growth.[18] Its share in the developing country MVA almost doubled (from 29 to 54 per cent over the period 1980-2000), overtaking the Latin America's position of being the leading region.[19] The share of East Asia with China, in the developing country manufactured exports reached nearly 70 per cent in 2000—a significant rise compared to 52 per cent in 1981.

Most of the countries in the region have succeeded in improving their industrial and export performances and in achieving better technological structure of their manufactured exports. The shares of their respective resource-based and low-tech exports in manufactured exports have been decreasing while those of medium- and high-tech exports have been rising. But China has reached the most impressive industrial and export performances over the last two decades. It leads the developing country group in world shares of MVA (see annex C, table C-4).[20] In 2000, China's manufactured exports expanded 26 times the value recorded in 1981. Respective export expansions of Thailand, Malaysia and Indonesia were 19, 13 and 12 times. In Indonesia and the Philippines the share of resource-based exports decreased significantly from 88 to 32 per cent, and from 65 to 7 per cent, in 1981 and 2000 (see annex A, table A-2).

China's shares of medium-tech exports in manufactured exports rose from 14 to 21 per cent (in 1981 and 2000). The respective rises for Indonesia, Malaysia, the Philippines, the

[17]East Asia (excluding China), leads in medium and high-technology-intensive sectors, followed by low technology and resource-intensive sectors. See annex A, table A-1 for Technology classification of exports.

[18]However, with China included it still lags behind the Latin American countries (LAC).

[19]Latin American countries' share fell from 47 to 22 per cent over the same period. For comparison, Sub-Saharan Africa lost its share from 1 to 0.8 per cent. South Asia, the Middle East and North Africa increased their shares slightly.

[20]This was mainly due to the higher shares of the natural-resource-intensive industries. See annex C, table C-1 for Technology classification of MVA and table C-3.

Republic of Korea and Thailand were from 2 to 18, 6 to 18, 6 to 12, 29 to 34, and 19 to 24. For comparison, this share decreased for Japan and the first group of Asian tigers (i.e. Hong Kong and Singapore, see table A-4) over the same period. The rises in the shares of high-tech exports in manufactured exports were the most striking in the Philippines, from 4 to 70 per cent, and in China, from 3 to 24 per cent (see table A-5).

East Asia has also invested in building its structural factors, skills, technology (acquisition, adoption and creation), and in modern infrastructure. It leads the developing world in all drivers (see table 1). The FDI shares in GDP have expanded for all countries. The largest shares were in Singapore, followed by Malaysia and China (see table B-2). The Republic of Korea and Taiwan Province of China controlled FDI and forced local enterprises to license or copy foreign technology at different stages of industrialization and to develop local technological capabilities through domestic R&D. Hong Kong SAR strategy was to use technology developed abroad rather than to invent new technology locally, while Singapore, Malaysia, and the Philippines were highly dependent on FDI rather than on R&D.

Modern infrastructure, measured by the number of telephones per one thousand of population, has been improved for all the countries in the group, and was the highest in Singapore and Hong Kong SAR (table B-3). The share of technical education attendance in total population has risen in all countries, except in Hong Kong SAR and the Republic of Korea, where it stagnated; and in Singapore where it worsened (table B-4). The Republic of Korea still leads strongly in skills, with high tertiary enrolments and a

Table 1. Structural factors of industrial performance

	Domestic technological effort		*FDI*		*Technology imports*		*ICT Infrastructure*		*Skills*	
	R&D per capita (US dollars) 1985	*R&D per capita (US dollars) 1998*	*FDI per capita (US dollars) 1981-85*	*FDI per capita (US dollars) 1993-97*	*Royalties & technical fees per capita (US dollars) 1985*	*Royalties & technical fees per capita (US dollars) 1998*	*Telephone mainlines (per 1000 pop) 1998*	*PCs (per 1000 pop) 1998*	*Tertiary technical enrolment (per 1000 pop) 1985*	*Tertiary technical enrolment (per 1000 pop) 1998*
World	22.9	71.4	13.3	63.4	2.6	14.2	152.5	64.9	11.1	14.6
Industrialized	(8)122.3	(9)402.4	54.8	241.6	12.0	66.2	571.1	316.5	34.3	40.1
Transition	n.a.	8.8	0.0	40.8	n.a.	2.5	214.0	42.7	n.a.	26.3
Developing total	0.6	4.6	4.3	26.9	0.6	3.9	62.6	14.2	6.3	8.7
East Asia with China	n.a.	8.7	4.3	39.7	n.a.	7.1	82.7	19.3	4.6	9.2
East Asia without China	3.2	31.0	14.5	63.3	2.7	26.6	119.3	48.6	12.3	21.9
South Asia	0.3	0.3	0.2	2.1	0.0	0.2	19.7	2.6	5.1	5.4
LAC	1.1	6.3	11.1	70.4	1.9	5.3	122.3	33.3	16.6	17.3
SSA inc. South Africa	0.6	1.3	1.7	8.2	0.4	0.6	16.5	7.8	n.a.	4.0
SSA without South Africa	0.0	0.0	1.9	5.3	0.0	0.2	5.7	3.4	1.7	2.7
MENA	0.4	1.4	16.9	14.1	0.1	3.0	115.0	14.8	13.6	20.5

Source: UNIDO, *Industrial Development Report*, 2003 and 2004.

high share of technical students in the population. The royalty payments' share of GDP shows rather mixed changes across the countries (table B-5). Singapore and Hong Kong SAR were among the top five developing countries in payments for technology per capita, followed by Malaysia, Taiwan Province of China and the Republic of Korea. Malaysia showed a striking rise. The enterprises-financed R&D (as a share of GDP) has improved for all countries, except for Thailand (see table B-6).

Asian countries participation in GVCs and GPNs

Increasingly, Asian countries and producers have been drawn into the emerging GVCs and GPNs, serving wider markets, often on a global scale. Their participation in these new global business formations is continuously rising and deepening. This is especially true for East Asia and China. Three sectors: textile and clothing (T&C); electronics; and automotive are analysed here.

In the textile industry, relocation of segments of entire production processes started in the 1950s, with the move from North America and Western Europe to Japan. During the 1970s and 1980s, the centre of clothing production switched to Hong Kong SAR, Taiwan Province of China and the Republic of Korea. In the late 1980s and the early 1990s, the bulk of the world T&C production was transferred to mainland China and several South-East Asian countries like Indonesia, Thailand, Malaysia and the Philippines. In the late 1990s, other South Asian countries joined the list. Recently, the participation in GVCs of the established players like Hong Kong SAR, Taiwan Province of China and the Republic of Korea has decreased while that of China and other South-East Asian countries has risen.

The shares of South-East Asia and that of China in the apparel imports of the United States, as the largest apparel-importer from the world, rose from 8 to 12 per cent, and from 8 to 14 per cent, in 1983 and 2001 (Gereffi *et al.,* 2002, pp. 30-31). If apparel exports worth US$ 1 billion in 1980 are taken as a benchmark for major players in the global industry, Hong Kong SAR, the Republic of Korea, Taiwan Province of China, China and the United States were the major apparel exporters. By 1990, Indonesia, Thailand and Malaysia in South-East Asia, and India and Pakistan in South Asia also entered this group. In 2000, the Philippines and Viet Nam in South-East Asia and Bangladesh, and Sri Lanka in South Asia reached the threshold of US$ 1 billion in exports as well (Gereffi and Memedovic, 2003, UNIDO).

Over a few decades, Asian producers were able to get out of their captive relationships with foreign partners in the apparel value chain (which assumed from producers only capabilities to assemble of cut fabrics following detailed instructions provided by the buyers). Increasingly, they began to take part in relational value chain interactions that call for higher competences of suppliers in full package production and more autonomy (i.e. capabilities to interpret designs, make samples, source the needed inputs, sustain product quality, meet price and on-time delivery requirements). This has allowed generating backward linkages with the domestic economy and to develop more integrated domestic industry. This has also allowed knowledge exchange (especially of tacit know-

ledge) for building personal relationships and for learning how to make competitive consumer goods for the international market (Gereffi, *et al.* 2002).

Participation of Asian countries in the electronics' global production system started in the 1960s, when Japanese firms began licensing to local firms in Taiwan Province of China, Hong Kong SAR and the Republic of Korea; at first for producing transistor radios and calculators. From the late 1960s, the United States and European firms relocated labour-intensive processes of semiconductor assembling to East Asia, particularly in Singapore, Hong Kong SAR, Malaysia and Thailand (Sturgeon and Lester, 2003). Involvement of Asian countries in this value chain has continuously deepened. For instance, until the early 1980s, almost the entire Hard Disc Drive (HDD) production was carried out in the United States. Today, South-East Asia dominates this area with 70 per cent of the world production. The example of Seagate, the leader in HDD industry, illustrates this point. Seagate's plants in Asia accounted for 64 per cent of its plants worldwide, in 2000. Asia's share in the company's production capacity has expanded from 35 in 1990 to 61 per cent in 1995, while its share in Seagate's jobs rose from 70 to 85 per cent during that period. It is interesting to observe Seagate's plants concentration in the Asian region. The production base is found in Bangkok, Penang and Singapore (Ernst, 2000). Moreover, its higher value added activities like engineering, R&D, and business services are increasingly being relocated to the region (Ernst and Luthje, 2003).

In the automotive industry, since the 1950 until the late 1980s, many developing countries have used import-substitution industrialization policies to promote the growth of the domestic activities in the sector (see more on the automotive GVCs in Humphrey and Memedovic, 2003, UNIDO). But, since the 1990s, trade liberalization policies pursued by developing countries have changed and shaped geographical organization of the industry. Today the automotive industry is considered as one of the most global of all industries. With manufacturing process and products being performed and produced by many producers in various regions and countries around the world. Although Asian countries' participation in the processes of globalization in this industry is still rather small in absolute terms it shows a rising trend. The share of Association of South-East Asian Nations (ASEAN) in World unit-sales of motor vehicles rose from 1.7 to 1.9 per cent, in 1990 to 2001, while that of China rose from around 1 to 4 per cent. The fast growing markets of East Asian countries, especially of Indonesia, Malaysia, Thailand, the Philippines and China, also contributed to the rapid growth of the automotive sector in the 1990s.

In the GVCs of the three sectors looked at above, China's progressive participation in their labour-intensive but also in higher value-added segments has enforced competitive pressures for many developing country producers. This has provoked public and academic debate on three main issues: *(a)* How China's rising competitiveness will affect other developing country specialization and especially that of its neighbours. *(b)* What will be the effects of China's accession to the WTO on the competitive position of some economies? And, *(c)* What will be the effects of the phasing-out of the Multi-Fibre Arrangement (MFA) quota restrictions, now under the WTO ATC, in 2005, and the Doha Development Agenda (DDA) implementation on developing country producers and their competitiveness? These questions are discussed in more detail in the following sections.

How China's rising competitiveness may affect developing countries

It is expected that China's rising competitiveness may affect its neighbouring Asian countries and other developing countries in two ways. One way is through the rising trade-competition with China at the respective domestic markets and important foreign markets. Good cases in point are Mexico and the South-East Asian countries losing grounds to China in labour-intensive industries. China, with its almost infinite supply of low-cost labour is now displacing Mexico and South Asian countries, considered as low labour-cost countries for some time. But, since 2001, 500 plants have been closed in the 3,700 Mexican *maquiladoras*, taking away 218,000 jobs, because of the shift of low-labour cost activities to China (Authers and Silver, 2003). Also, a considerable share of the outsourcing activities by TNCs to the South-East Asia countries, which occurred in the 1980s and 1990s, are today diverting to China.

The other way is through the investment diversion to China. The country's many favourable investment pooling factors like cheap, abundant, skilled and disciplined labour force; capabilities in full-package production; deepening of participation in GVCs and GPNs; large market size; good shipping connections; and the accession to the WTO, make it become a highly attractive place for foreign investors. In China, industrial wages are on average 40 cents an hour—less than a third of the average in Mexico and Malaysia, and one quarter of Thailand's average (Magariños *et al.* 2002).

It is estimated that the competitive pressures from China's rising participation in the global economy will continue to grow because of its low production costs and raising industrial and technological capabilities. According to some forecasts, China will gain large market shares in clothing but also in shoes, semiconductors and televisions.

What effect will China's accession to the WTO have on the competitive position of Asian countries?

Estimation of the effects of China's accession to the WTO on the competitive position of major East Asian countries and to the neighbouring countries has been the subject of various evaluations and forecasts in recent publications. Lall and Albaladejo (2004) analyze the "export threat" by China, based on China's escalating exports; abundant, cheap and productive work force; attractiveness to foreign investors; and freer access to world markets after joining the WTO. Using the market share analyses they assess the extent to which the neighbouring countries' export structure resembles that of China, over the period 1990-2000. China shows "competitive threat", if it gains export market shares while the other country loses.[21] According to their calculations, in the neighbour-

[21]Ibid. The extent of this relative change in the gains determines the intensity of the threat from China. The study also analyses respective relative world market shares (exports and imports), as well as the shares of China and its neighbouring countries at their respective main markets (the United States, Europe and Japan) over the period.

ing developing countries, the mature "Tigers", Hong Kong SAR, Singapore, the Republic of Korea and Taiwan Province of China, suffered most from China's raising competitive strength so far, but in products with low-technology intensity, in which they were already losing their competitiveness. The New Tigers, Malaysia, Thailand, the Philippines and Indonesia, were also affected by China's expansion of low-tech exports, resulting in low-market share gains rather than in share losses.

The authors estimate that the less-technologically advanced New Asian Tigers will face the biggest tensions. These countries have higher wage levels than China and are also suffering from the lack of domestic capabilities in many crucial areas. They compete with China in the low-labour cost and thus in the low-tech intensive products, in domestic and foreign markets. To retain large market shares in these product groups, they will have to meet constantly raising market requirements for quality, design and marketing skills. The same challenges hold for footwear, toys and other labour-intensive products.

In the medium-technology intensive products, such as automobiles, machinery and simple electronics, the new and the mature Tigers can face serious competitive challenges from China. In the high-tech products, their calculations suggest complementarities rather than competition in the regional division of labour, as China is already participating in a division of labour of the complex production networks in electronics in the region. But they point out that these complementarities may not be sustained if China continues to deepen its participation in GVCs and GPNs.

The authors conclude that there are also clear opportunities for mutual benefits and development between China and its neighbours, as China's import growth is higher than its export growth in the aggregate intra-regional trade. If this trend continues, those neighbouring countries undertaking proper restructuring and developing capabilities to match the new competitive requirements should be able to maintain their respective high export growth to China.

Shafaeddin (2004) analyses of export and import data show that China competes with South Asian countries, India, Pakistan, Bangladesh, Sri Lanka and Nepal in labour-intensive manufactured goods in developed countries' markets (in labour-intensive segments of clothing VC); while their trade with China creates little demand complementary effects. China also competes with Asian NIEs and Association of South-East Asian Nations (ASEAN) countries in finished, capital- and technology-intensive goods (in data processing equipment, telecommunications equipment and some electric machinery). For NIEs, such competition involves complementary effects as China's imports of parts and components from these countries could offset the competition effects in the short and medium run. The Republic of Korea and Singapore will most benefit from liberalization of imports by China in the short run. But as China develops its capacity to produce components, the "competition" effect may dominate. The paper concludes that it is possible that China's industrialization will deepen and that it will raise value added of its exports. This could lead to improvement in its competitiveness in technology and skill-intensive products, which are of interest to NIEs and the ASEAN, but such development takes time.

Following the recent findings discussed above, it can be concluded that the respective challenged countries should see the new economic developments in China as an opportunity rather than as a threat for their growth. The recommended policies to be followed are on two levels: *(a)* at the industry and *(b)* at the national economy level. At the industry level, efforts should be focused on medium- and high-tech manufacturing activities. This calls for productivity enhancement through skills and technology upgrading, and through setting up backward linkages to the local industries and forward linkages to markets. At the national-economy level, developing structural factors allowing the industrial upgrading is crucial. This includes public involvement in enhancing physical and knowledge infrastructure and utilities, in the provision of technology extension services, in setting up export processing zones and industrial and technology parks, and in providing financial incentives (tax relief, loans, and so on). Equally important are labour law reform, reforms of institutions and governance structures.

Foreign investors would most likely welcome such policy efforts, as they might not want to solely rely (or beyond a certain level) on China for critical inputs. Given this, investors' reason of hedging against the risk through investment diversification, a good industrial and investment policy in the countries of the region (or in other developing regions) would enable the threatened countries to cut possible losses from the investment diversion to China and to rise their exports to the Chinese market.

China will most likely improve its competitive advantage and efficiency in medium- and high-tech products. This will allow China to carry out manufacturing of more sophisticated products and to move to higher value-added segments of value chains. Again, this underlines the point that the countries of concern here will be threatened only if they would not be able to develop and carry out strategies and programmes that would help them to build industrial and technological capabilities to compete with China in these segments of VC (Evans and Harrigan, 2004, pp. 10-11).

What are the effects of the phasing-out of the Multi-Fibre Arrangement (MFA) in 2005 and the implementation of the Doha Development Agenda?

Contrary to most other industries, globalization of production and trade in T&C sector has been shaped by the protectionist trade regime. From 1974, the Multi-Fibre Arrangement (MFA) and from 1995 the WTO Agreement on Textile and Clothing (ATC) have influenced T&C trade patterns at the multilateral level, while preferential market access and the rules of origin of regional and bilateral trade agreements regulated trade flows at the regional and bilateral level.[22]

[22]Six countries and regions applied quotas under MFA (the EU, Austria, Canada, Finland, Norway and the United States) while four countries and regions, Canada, the EU, the United States and Norway, carried out MFA restrictions into ATC. In 1995, the WTO ATC led to a progressive restraint of the quotas set in 1974 under the MFA but a great part of those quotas are to be abolished only in January 2005.

The MFA, designed to protect local producers and thus jobs in the importing developed countries, provided rules for imposing quotas through bilateral or unilateral actions, when surges of imports cause disruption in trade and production in the T&C sector of importing developed countries. The MFA quota system has been applied differentially across countries and products. More than 30 countries and their specific T&C products have been highly constrained by quotas while other countries have largely been unaffected. The most restricted T&C exporter was China. The MFA restrictions also discriminated between developing countries. An estimate of the tariff equivalents of the quotas suggests the highest protection toward Asian countries, such as China, India, Malaysia, Indonesia and the Philippines, and the lowest toward Central and Eastern Europe (Francois *et al.* 2000). At the beginning of the ATC phase-out, the lower-income suppliers in India and elsewhere in South Asia faced higher restrictions than suppliers from East Asia did. Even all the least developed countries (LDC) did not have the same preferential market access (Francois and Spinanger, 2004). The quotas were also more restrictive for the clothing than for the textile sector (with the exceptions of Bangladesh and the Eastern European countries). This discriminatory trade regime has distorted specialization in T&C industries for more than four decades (see box 5 on the Effects of MFA)[23].

The WTO ATC, alongside progressive application of General Agreement on Tariffs and Trade (GATT) rules, calls for a gradual elimination of quota restrictions from MFA along three stages, corresponding to three periods: 1995-1997; 1998-2001; and from 2002-2004. The quota restrictions will be fully phased-out by 1 January 2005. Products covered include tops and yarns; fabrics; made-up-textile products and clothing. Since gradual liberalization in quota restrictions was postponed until the last phase-out stage, 49 per cent of the planned quota phase-outs and in the most restricted categories of T&C products will occur in the final trench, as of 1 January 2005. This may produce a shock, triggering other forms of protection.

The world's largest importers of T&C, the United States and European Union (EU), with the respective world imports' shares of 24 and 20 per cent, have pursued a different approach to the T&C liberalization.[24] The United States have used the most restrictive quotas while the EU has progressively liberalized its T&C imports. The share of EU imports under quotas was 25 per cent; no quotas were applied on LDC; and the unilateral preferences of 20 per cent cut in tariffs were granted to all developing countries; except for Mediterranean countries, for which liberalization of the T&C import regime has been postponed until the final phase (Spinanger, 2003, p. 8).

[23]The origin of the MFA dates back to 1961 and 1962, when the negotiations of the Short Term and the Long Term Arrangement (STA and LTA) of International Trade in Cotton Textiles started. The LTA allowed developed countries to impose restrictions, unilaterally or through a negotiated voluntary restraint agreement, on imports from LDCs, considered to be a source of actual or potential "market disruption". The LTA meant breaking of the non-discrimination principle of the GATT. The provisions of LTA were preferred to provisions of the GATT that allowed safeguard action, retaliation, and proof of "serious injury" rather than "market disruption". The developed countries considered the LTA to be more advantageous for LDCs, as they offered a transparent set of rules for market access, including guaranteed increase in quotas (of 5 per cent per year in most cases) in relation to facing a series of ad hoc, restrictive measures. The LTA also required from developed countries to undertake adjustment measures with the purpose of restructuring their industries and returning international trade in textiles and clothing to GATT rules. The LTA was extended twice in 1967 and 1970. The extension of the arrangement in 1974 gave way to MFA.

[24](http://trade-info.cec.eu.int/textiles/index.cfm)

Box 5. MFA quota systems and specialization in GVCs and GPNs

The MFA quota system caused* the *diversion of outsourcing and constrained specialization according to comparative advantages

- China and India with comparative advantages in T&C faced binding quotas (i.e. filled quotas), while other countries without comparative advantages attracted foreign investors with their unfilled quotas. Once quotas were exhausted, TNCs moved to other less-quota restrained locations and product categories. They created new supply chains based on quota advantages of locations rather than on local productive capabilities. They also opened new foreign markets for many developing country producers, which they would otherwise not be able to enter based on their weak competitive advantages. For instance, MFA has attracted clothing producers from Republic of Korea and Taiwan Province of China to outsource to Africa, South Asia (Bangladesh and Sri Lanka) and to Latin America (Dominican Republic, Guatemala and Honduras) to take advantages of the quota easy market access. Still, these MFA-generated benefits were not without cost for local producers. Shielded from the outside competition they were also shielded from the incentives for their local industrial and technological upgrading.
- Different division of labour and therefore the governance of the clothing GVCs emerged under this system: *triangle manufacturing* between the United States, NICs and other Asian countries, where large trading intermediaries emerged to coordinate the orders from the United States and the EU buyers, with many small factories established in locations with quota-free access; *outward processing trade* between Western European countries and Eastern European Countries; and *production sharing* between the United States, Mexico and Caribbean Basin Initiative (CBI), extending preferential tariff treatment to textile and apparel products assembled from the United States' fabric.
- The uneven quota utilization also shows that the quota system has constrained specialization in the narrow product groups in T&C value chains and thus the rapid adjustment to the changing market conditions, as quotas were allocated based on disaggregated product level (6-digit HS level) and covered many products (Nordås, 2004, p. 10).
- The quota system has also prompted the upgrading of developing country producers from the East Asian countries. When the quota-seeking investors moved to the less quota-restrained locations, East Asian producers moved into the unprotected segments of the value chain, often with the higher-value added, like design and marketing, and started to outsource their lower-value added activities to other countries, gradually developing capabilities in coordination and control over them (Gereffi and Memedovic, UNIDO, 2003).

The MFA quota system has caused higher production cost and wasting of resources

- Quotas have raised production costs indirectly, through restricting supply of goods and creating scarcity price premiums and thereby inflated clothing prices (traded quota added US$ 1.5 to the costs of men's knot shirts; US$ 5.25 to the cost of men's jeans and US$ 21 to the cost of men's suits; Gibbon, 2003); And directly through creating high rent premiums to holders of quota licences while often the importers–big retailers, have pocketed them.
- Productivity of firms in quota-constrained countries was dependent on quotas that were traded. Firms had to buy quotas to expand their exports and because the market for licences was volatile, it was not always possible to buy enough quotas to sustain the profitability.
- Quota system also caused wasting of resources for administration and for monitoring and controlling trade in T&C, as the system stimulated rent-seeking, transhipment, rerouting, and false declarations of country or place of origin, and the fibre content of the T&C product (Nordås, 2004).

Some regional and bilateral trade agreements of the EU and the United States with developing countries have also provisions on rules of origin (RoO), allowing the tariff and quota free access for developing country producers, provided their exports use importing country's yarn, fabrics and dying; For example, the trade agreement of the Unites States with Singapore, the African Growth and Opportunity Act (AGOA), and the like.[25] In same cases, these RoO were complex, creating spaces for manipulations and have adversely affected competitiveness of producers, who were forced by the RoO provisions to use fabric that is more expensive. They have constrained developing country producers to create backward linkages with the rest of the economy and to upgrade and diversify in the sector.

Besides quotas and RoO, imports of T&C from developing countries in most OECD countries have been constrained by high tariff rates, tariff peaks and escalations, and through other non-tariff measures, like safeguards, anti-dumping and countervailing measures, and administrative, non-technical and technical barriers to trade and by the product labelling (EURATEX, 2003). The EU has been the main user of anti-dumping measures. Its anti-dumping cases were recorded in higher value-added products of T&C value chain and targeted imports from developing countries, although this was the product of small or medium sized firms' activities with small export volumes.[26] Anti-dumping measures were less used in the United States, but have produced the same effect (ITCB, 2003, p. 3). Developing countries and India have also begun to use anti-dumping measures extensively, while China has not used them so far. But, China's Compulsory Certification system (CCC) and its implementation reportedly cause technical barriers to trade (WTO, 2004).[27]

Recent projections on the potentials for welfare gains, and export and production rise from trade liberalization in T&C

Since 49 per cent of quotas on the most restrictive categories of T&C products, and almost all in the highest value added segments of the T&C value chain, is delayed until the end of 2004, many studies use general equilibrium models, and especially Global Trade Analysis Project (GTAP) model, to assess the potential impact of T&C liberalization on the welfare gains, production and trade flows, at the national, regional and global level.[28] According to these studies, phasing out of quotas could create losers and

[25]The United States' trade agreement with Singapore contains 203 pages on RoO. Under AGOA, different market access has been granted for sub-Saharan countries' T&C exports. The poorest economies are granted duty-free access under the GSP rules, while potential benefits from the AGOA, are relevant only for those economies with a clothing industry. Also not all countries covered by GSP have been granted liberal RoO. The Least Developed Beneficiary Country (LDBC) provision applies to countries with per-capita incomes below US$ 1,500 in 1998, which were granted access to United States markets provided their final assembly should be in the country of origin, regardless of where yarn spinning or fabric weaving or knitting occurred (Gibbon, 2003).

[26]Between 44-66 per cent of EU imports coming from developing countries was subject to dumping practices.

[27]The System requires separate certification for each and every imported component instead of a single certificate for the whole product when it is imported in parts; It sometimes leads to double certification for certain products; It is discriminating against foreign producers; and is often not accepting certificates from the country of manufacturer although it followed internationally recognized standards.

[28]GTAP belongs to a family of economic models characterized by an input-output structure (based on regional and national input-output tables) that explicitly links industries in a value added chains. The GTAP uses an input-output structure (based on regional and national input-output tables) that explicitly links industries in a value chains.

beneficiaries among countries and in countries. The immediate losers will be workers in the high-cost developed countries, where the quota system has protected their jobs, and in the less competitive developing countries, losing market share to China. In developing countries, pressures to lower wages and to neglect working conditions and labour and environmental standards can also be expected.[29] Even for China, it is not clear how projected shifts in T&C production to China will affect its workers.

The immediate beneficiaries are expected to be the consumers.[30] Quota elimination would raise efficiency in production through ending quota rents and rent-seeking activities. This would result in the consumer price decreases and in welfare gains in the importing developed countries. Still, a recent OECD study (2003, p. 4), reviewing the econometrical estimates of the ATC liberalization, points out to the considerable variation in the estimations of global benefits and welfare gains' distribution. Estimated annual global benefits range from around US$ 7-324 billion, and from up to two-thirds to only for 5 per cent of all estimated gains from the Uruguay Round. Some studies predict developing countries as the main beneficiaries of ATC reform, while others argue the developed countries can benefit the most. It is calculated that of all protectionist measures causing a large welfare loses in the United States, almost 90 per cent are caused by restrictions on T&C imports, while in the EU they generated the costs of around €250 for each family of four (Spinanger, 2003). But, most of the studies agree that lower consumer prices and more efficient resource allocation will probably result in the welfare gains for all countries in the longer run.

For the countries in the Asian region, Francois and Spinangers (2002) model, including the entire China's WTO accession package (tariff reductions, quota-free access and services liberalization and the improvement in business climate in China), predicts a GDP raise of around 6 per cent for China and 0.15 per cent for Hong Kong; a GDP decline of about a third of a percentage point for Chinese Taipei; marginal GDP raise in Japan and the ASEAN countries; larger GDP rise in Republic of Korea and Viet Nam; and shift from declining to rising GDP change in Bangladesh and other South Asian economies.[31]

Various econometrical simulations also consistently project a substantial potential for T&C market share raises of China and India, followed by Hong Kong SAR and Viet Nam after 2005. Francois and Spinanger (2002) predict raises in textiles' exports from China of 39 per cent and that of clothing of 168 per cent, while their respective output rises are 45 per cent and 125 per cent to the base year (1997). China's clothing exports would amount to over 25 per cent of world exports in the base year. India's clothing exports will grow even faster at 218 per cent. Among other developing countries, only Viet Nam will benefit from the ATC implementation.

[29]One job protected in developed countries has cost 35 jobs in developing countries (Jonguières, 2004).

[30]The estimation of annual costs of quotas for the United States consumers is US$ 70 billion while each job saved by quotas in the United States industry is estimated to have cost consumers on average US$ 170.000 (Jonguières, 2004).

[31]They used upgraded version of computable general equilibrium model of the GTAP, which included variables of income changes, trade and shifts in production/market shares. The improvement in business climate in China (i.e. the raised competitive position of China for producing T&C products) is estimated as 10 per cent cost advantage for firms doing business in China.

Nordås (2004) results predict that in the EU market, China and India will gain in market shares in textiles (23 per cent), followed by Indonesia and Bangladesh. In clothing, market share gains of India and China are even higher: their combined market share rises from 24 to 38 per cent. Other countries, like Turkey and Central and Eastern European countries, will lose their market share; or will not improve their market share significantly, like the Republic of Korea, Hong Kong SAR, Indonesia and Bangladesh.[32]

In the United States market, China gains in market share in textiles by about 50 per cent; Bangladesh and Sri Lanka by almost 50 per cent, but from a low base; while India's market share is not changed. In clothing, China is tripling its market share and India quadrupling. Market share of India and China taken together is 65 per cent in comparison with 20 per cent in the base year. All other countries lose their market share, and Mexico will have the largest losses. Its market share will decline by around 70 per cent (Ibid. 2004).[33]

China's rising demand for imports of textile and other intermediary inputs for the growing clothing industry may also create opportunities for other Asian countries. Those producing high-fashion and high-quality clothing will benefit the most, mostly ASEAN countries while other South Asian producers that use traditional labour-intensive methods for low-quality textile production are unlikely to benefit from this.

Given the projected potentials for T&C exports and production expansion of China and India, the question remains whether they will be able to realize them. This will much depend on how these two countries will deal with their internal restructuring and with the expected raising use of contingent protection measures and tariff and non-tariff barriers by the importing countries (as shown in box 6).

Box 6. What are the challenges for China and India after 2005

Several modelling results on the impact of the China's accession to the WTO and the MFA phasing out predict significant shifts in T&C production and trade to Asian countries, particularly to China and India. They will gain significant market shares in the EU, the United States and Canada. Given these projected potentials for T&C exports and production raises of China and India, the question is whether China and India will be able to realize them.

India with its developed and clean institutions, established rules of law and protection of intellectual property, still lags behind China in education, infrastructure, and is less open to international trade. India, with export potentials and reached competitiveness in many T&C subsectors (in dresses and T-shirts and in various textile products in the EU market; and in woven skirts and cotton fabrics and made-ups in the United States' market), is suffering from protectionist internal and external policies. These restrictive policies have constrained the country's ability to meet intensified competitive pressures and to become global T&C supplier. Several restrictive policy instruments have been used in T&C industry like spinning mills requirements to produce a share of their output suitable for the handloom sector, a technology used by small

[32]The GTAP model in Nordås (2004) uses 1997 as reference year, while the ATC was introduced in 1995 and all quotas will be phased out by 2005. Since little had changed from 1995 to 1997, a simulation using 1997 as the base year is assumed not to create a major problem for analyzing the impact of the ATC. The two scenarios that are simulated are the base line GTAP solution and a simulation where the quotas are eliminated and all other parameters and resource endowments are constant.

[33]GTAP simulations of Ianchovichina and Martin (2001) give similar results.

firms, but out of use in other countries; import taxes on synthetic fibres; and export quotas on cotton and cotton-based fibres to stimulate local inputs in the domestic clothing industry. These policy tools resulted in locally integrated but heavily protected T&C industry with outdated technology and lagging far behind China in productivity. In 2001, some policy instruments that were biased in favour of small size enterprises and discriminatory fiscal policy were abolished, but the effects of these changes will be felt only with some time lag (Srinivasan, 2004).

In contrast, China's advantages are not only in cheap and abundant labour force (with wages lower than in India and Viet Nam), but also in its good infrastructure, raising logistics capabilities, educated work-force, high rate of private savings, liberal trade regime, business-like attitude, industry's rapid response, eagerness to understand customer demand, and most importantly in willingness to learn and upgrade. China's economy is more open. Its average tariffs, after it joined the WTO in 2001, are the lowest in the developing country group. Non-tariff protection is also dismantled. China is also open to foreign investors and new ideas, technology and management know-how.

China is the largest recipient of FDI and its exports is growing fast and faster than that of India. It is predicted that it can soon become one of the three world's biggest exporters, following the United States and Germany. China is more integrated in the GVC and GPN activities than India: it is undertaking technological and organizational upgrading in its T&C supply chain and has developed capabilities in full-package production; and it is now able to deliver finished garments to United States, EU and Japanese retailers. China is also abundant in the raw materials like cotton and man-made fibres, ramie and silk. It imports other high-quality fabrics from other Asian countries like Japan, and Republic of Korea. Its established linkages with the big trading houses in Hong Kong SAR and Taiwan Province allow leveraging marketing, managerial and financial management skills from foreign partners. Thus, many experts believe that China's T&C sector may pose significant competitive threats at the global market.

Still, China will also need to face its internal problems related to inefficiencies in administration and bureaucracies, environmental issues, financial system functioning, restructuring and income distribution. Major industrial restructuring is expected in the automobile industry, which is guarded by high tariff rates and shaped by the restrictive policy of regional dispersion of production facilities. This has led to inefficiency and non-competitive products. Francois and Spinanger (2004b) simulations predict that without internal restructuring this industry remains uncompetitive**.**

Besides internal restructuring challenges, India and China will most probably also face challenges ahead of raising use of tariffs and contingent protection rules by main importers of their products. For the start, T&C exporters from China and India will face rising of the EU duties on their exports as they will lose most of their EU GSP treatment as of 1 January 2006. Today, tariffs range from 12 to 33 per cent, in the EU and United States, and are even higher in many developing economies.[34] Pressures to raise tariffs after quota elimination may rise to pay for the loss of margins generated by the quotas, because tariffs may significantly restrain trade in T&C products as they cross borders several times in the GVC framework.

The contingent protection rules, being part of the protocol of China's accession to WTO and to which China agreed, permit other WTO members to use protectionist instruments against China for 15 years. Those instruments cover special anti-surge clauses for T&C products for 4 years (2008); general anti-surge clauses for 12 years; and initiations of anti-dumping cases, allowing China to be treated as a non-market economy for 15 years. Developed countries lobbies will also seek to use other protectionist devices like eco-labelling schemes, labour standards rules and other regulatory devices to control imports from China. The non-tariff barriers (NTBs) and the technical barriers to trade (TBTs) may impose extra costs to suppliers.

[34]Many retailers will most probably try to hedge against this risk by sourcing from countries outside WTO, like Viet Nam. But pursuing the tariff reductions under Doha negotiations' agenda, the shift of T&C trade will be accelerated.

How will other countries be affected by quota elimination?

Quota elimination will especially affect countries with the bilateral trade agreements with the EU and the United States and those that are under the Generalised Systems of Preferences (GSP) schemes for some exports in the EU, United States, Japan and other developed country markets. Their preference margin will be smaller as low level-tariff benefits are estimated to be less significant than quota benefits are.[35] Their preferential margin will further erode when tariff reductions (below the prevailing levels on the important markets) and services liberalization under the DDA is carried out (Francois and Spinanger, 2004). The lower the DDA duties agreed the higher the preference erosion will be. The EU has dealt with this problem pursuing the "Everything But Arms" (EBA) initiative, where the poorest developing countries have duty-free access to the European market (except for trade in agricultural products).

Countries in trade agreements with the United States will face the highest risk. Mexico will lose out the most. With the NAFTA, Mexico profits from quota-free access to the United States' and Canadian markets in T&C. It also enjoys tariff preferences and special market access arrangements in other product and service sector areas as well. When some of these preferences are abolished with the quota elimination, or eroded with further tariff cats, the advantages for Mexico will decrease and diminish the positive effects of liberalization. Francois and Spinanger (2002) estimation of losses for Mexico include: 1 per cent loss caused by the elimination ATC quotas by all WTO members; another loss of around 1 per cent attributed to China no longer being subjected to ATC quotas; and almost extra 1 per cent loss because of tariff cuts and services' liberalization under DDA. Although Mexico has benefited from NAFTA in a post-MFA world, NAFTA will not guarantee industrial and technological upgrading. Mexico will need to develop full-package production capabilities to be able to face China's raising competitiveness in this sector (Gereffi *et al.,* 2002, pp. 23-53).

Sub-Saharan African countries, signatories of the AGOA, whose T&C production and trade benefited significantly under AGOA, will be hurt by the MFA phasing out and with the replacing of the current liberal RoO with the more restrictive provisions, although they have not fully used their quotas.[36] Recent simulations by UNIDO on the benefits of AGOA and EBA initiative, and to which extend these can be eroded by China's accession to the WTO and the MFA phasing out, show that clothing industries in sub-Saharan States will be indeed hit hard and their world market shares will decrease (UNIDO, 2004, pp. 11-13; 64-70). In the quota-free world, they will lose their key-pulling factor for foreign investors. As regards other pooling factors, African-based exporters do not yet have capabilities at the competitive levels with China. Their productivity is much lower than the one in China, while wage costs are not different from those in China (UNIDO, 2004, p. 13). More restrictive RoO will also force African enterprises to use

[35]Estimates derived based on interviews with market participants in the quota trading market and reported in Kathuria, Martin and Bhardwaj (2003), pointed to average external tariff equivalents of around 40 per cent in the United States and 20 per cent in Europe, during the period up to 1999.

[36]How restrictive RoO of AGOA are is reflected in the quota utilization rates. Quotas on products assembled from non-US fabrics were filled with 36 per cent; the limit on products subject to liberal RoO was utilized with 62 per cent and quota on products assembled from regional fabric was filled with less than 10 per cent (Gibbon, 2003).

higher-cost fabrics (regional or US-made), making it difficult to compete in the United States market and to diversify into clothing.

Other developing countries with the export structure and competitive advantages based on the favourable quota treatment and thus on the price distortions, and with high dependency ratios for T&C exports, will be the most adversely affected. Those are the countries with more than three-quarters of all apparel exports in highly constrained quota categories and which sell a range of products, thus competing with prices rather than with quality, like Lesotho, Haiti (among the least developed countries, LDCs, and with the high export dependency on these sector) and Jamaica, Honduras, El Salvador, Kenya and Nicaragua (Hillman, 2003).

In the EU, the United States and Canada, local producers that have enjoyed more than 40 years of "temporary" protection are likely to lose their market shares. They will face a long-term structural decline.

The impact of a complete liberalization package

Quota elimination, tariff reductions and services liberalization according to the DDA will together most likely result in a concentration of production in those developing countries with capabilities in the full-package production. It is estimated that large retailers and manufacturers (for example the Gap, JC Penny, Liz Claiborne and Wal-Mart) will demand price cuts and will reduce the number of developing countries from which they would source: from 30-40 today to 10-15 countries when quotas are ended (Jonguières, 2004). This would favour trading intermediaries in global apparel value chain with strong logistic capabilities and large producers from China, India and Pakistan.

Those LDCs, such as Cambodia, without primary textile industry will be at stake. Although Cambodia still benefits from trade preferences given to 49 LDCs, there will be more competitions with countries such as Bangladesh, Nepal and Lao People's Democratic Republic. When the tariff reductions and service sector liberalization are finished under Doha negotiations, Bangladesh and other South Asian economies' export gains from quota liberalization could disappear.[37] For fashion clothing sensitive to market fluctuations, demand for the rapid delivery and replenishment (re-ordering continuously throughout the selling season) will continue to affect outsourcing activity and trade patterns.

In conclusion, pressures for a large-scale reallocation of resources in the global economy can be expected and the adjustment problems following the MFA phase-out will be important policy challenges ahead for developed and developing countries alike. For the LDC and smaller and most vulnerable countries, the issues is whether they will be able to bear the adjustment costs arising from quota elimination and anticipated surges of exports from China and India. This issue deserves high attention from the international community.

[37]For India this is estimated as 50 per cent drop in the export rise after ATC quotas elimination (Francois and Spinanger, 2004).

IV. Industrial policies and manufacturing competitiveness: what are the lessons from the Asian experience?

Enhancing competitiveness through strategies and policies

Against the background of accelerated globalization and intensified competitive pressures, enhancing export-competitiveness through various strategies and policies has become a central preoccupation of developed and developing country governments alike. Recently, for instance, branding has become an important strategy tool to enlarge export market shares. The scope of the branding strategy has expanded from corporate, to national and regional brands, to include brands like "Made in Asia" or "Made in Europe," where these different brands interactively promote each other.

Just as building corporate brands, creating and sustaining national and regional brands calls for large involvement of all participants (public and private), and for considerable investment in the image-building strategy and in research on what are the external perceptions on national and regional qualities and products. But this strategic tool is also not free from the exposure to risk of failure. The recommended route to follow is to start from sector- or firm-led branding and then slowly continue to national and regional brand development [for example, from BMW, Mercedes Benz-corporate brand to German (national) cars (sectoral) brand].[38]

Most importantly, reaching competitiveness is more than just rising exports growth or gaining market share. It is how to reach competitiveness enhancement not through the "low road" of cutting wages, devaluating exchange rates and disregarding labour or environment regulations—each incompatible with sustained growth—but through following the "high road" of competitiveness, the road of productivity enhancement. The high road consists of building capabilities to acquire and use new technologies to efficiently produce and trade diversified products and in enough quantity and quality to be able to support higher wages and national income.

[38]Domeisen, N. (2003).

A fast-track strategy for leveraging resources for economic development

Participating in GVCs and GPNs is being advocated to policy-makers, particularly in developing countries, as a fast-track strategy to gain access to technologies, knowledge and skills of the leading economies. But to leverage productivity gains through pursuing such strategies and to catch up, countries and their enterprises need to address a variety of important issues on mechanisms of technological learning and mastery, which are at the core of the catch-up process (Nelson, 2003). Those include national strategies and policies that influence framework conditions (political, social and macroeconomic stability); and in them the special attention should be given to the building of the national system of innovation for technological learning and mastery. This system comprises investment in education and training; in national research effort; in physical infrastructure, utilities and logistics capabilities; in the provision of business development services; in sound rules and regulations (including competition polices and property rights protection) and their enforcement mechanisms; and in the quality of governance at the firm and government levels.

Those issues also entail greater openness to trade and investment, imported technology, information flows and new ideas. Attracting foreign investors and partners, especially in high-tech industries, calls for a favourable business climate, fluid import and export procedures, for low business transaction costs (dealing with rules, regulations and the bureaucracy), and for good governance.

What lessons can be learned from the Asian experience?

According to the UNIDO Industrial Development Scoreboard, only a small group of developing countries has shown dynamic production and export structures, with rising shares of technology-intensive products, during the last two decades. Those include, Singapore, Hong Kong SAR, the Republic of Korea, China, Taiwan Province of China, Malaysia, Indonesia, India and Thailand. Although these successful Asian countries had similar industrialization patterns, they have followed different strategies and policies to improve their supply-side capacities and to successfully compete in GVCs and GPNs (see table B-3 on structural factors).

Taiwan Province of China and the Republic of Korea succeeded to purchase foreign technology through arms-length and combined this with domestic research efforts and a constraining of inward FDI. At first, these countries used strong industrial policies, targeting the activities they wish to enter and the functions they wish to upgrade. Singapore, China and India have managed to combine their reliance on FDI with strong industrial and trade policy, focusing on specific activities in the value chains and developing human capital and infrastructure. Singapore, for instance, has been participating in high-tech global value chains while developing local skills and physical infrastructure. The country has become one of the global leaders in manufacturing of advanced

electronics, with impressive design capabilities and growing local linkages. In contrast, Malaysia, the Philippines and Indonesia, have relied on FDI but used passive industrial policies, combined with sound economic management, pro-business environment, and attractive locations. China followed the road of getting foreign ideas, technology and management know-how through FDI, royalties and licences, combined with domestic R&D efforts, skills and infrastructure building.

An important common feature of the successful East Asian countries is their active government involvement in and support of the catch-up process. This ranged from the protectionist trade and investment policies but less strict intellectual property regimes; to direct and indirect subsidies; to fostering local skills and infrastructure development and domestic research effort combined with the establishment of the intermediary institutions for supporting the innovation and learning efforts of firms. Singapore and Malaysia, for example, have been running sophisticated investment promotion agencies designed to reach strategic industrial development objectives. Science and Technology Parks have also recently been used by China, and are also considered as another promising tool to create a dynamic business environment. In the realm of standards and metrology, the systematic activities of the Singapore Productivity and Standards Board (PSB) can serve as a good benchmark, for the ways in which a country can bring its firms up to a desired standard. As a public body, in close cooperation with its private and public sector partners, the PSB has run several programmes that were designed to ensure that domestic firms are producing quality products and were meeting national, international, or industry standards. In a similar vein, over the last decades the government of Taiwan Province of China has established increasingly sophisticated institutions, centres and (inspection) procedures to respond to the high concern for quality control of manufactured goods needed for successful export performance. And, many East Asian governments have established cluster development institutions to support related collective action in cluster networks, such as collaborating to get new competencies through linking to GVCs and GPNs.[39]

Several lessons can be learned from the successful Asian countries that could serve as basis for drawing the core policy recommendations for the less successful Asian countries (box 7) and other developing countries. First, latecomers can enter those activities in the GVCs for which their capabilities are suited rather than trying to enter in all activities of the value chain. Latecomers can also enter dynamic activities in a value chain, those with great opportunities for technological learning and spillovers, but these leveraging strategies have to be pursued with a great care and not only by the frontline enterprises, but also by other enterprises, institutions and organizations, and by governments at different levels. This calls for design of new and creative policies that work in the present context. The economical and political context is different today than when the Asian Tigers mounted their industrial policies for catching-up. Innovation has accelerated, some industrial policies are prohibited, or conditioned, or need to be stricter (such as intellectual property right protection), when entering various international trade and investment agreements (multilateral under the WTO, bilateral and unilateral). For these reasons, countries have to use policy instruments that are compliant with the multilateral and bilateral trading system.

[38]For the Malaysian example, see Best and Raja (2003).

Box 7. Core recommendations for the less successful Asian economies

- ❑ Design own industrial strategies and policies, as industrial policy-making is country specific.
- ❑ Draw own lessons of experience from successful Asian countries, taking into account the economic development level, availability of resources, entrepreneurial capabilities, potential areas of dynamic comparative advantages and present economic and policy context.
- ❑ Avoid "low road" of reaching competitiveness–of cutting wages, devaluating national currencies, and disregarding labour or environmental regulations, which is incompatible with sustainable growth.
- ❑ Follow the "high road" of competitiveness by supporting building of capabilities to use new technologies, adapt and improve processes and products, and move up the value chain into more sophisticated production.
- ❑ Use the participation in GVCs and GPNs as a fast-track strategy for leveraging resources for servicing development goals in combination with policies that are targeting:
  - — Improvement of the framework conditions (political, social and macroeconomic stability) to stimulate FDI.
  - — Investments in building structural factors like skills (especially widely available primary and technical education); domestic R&D effort; and physical (and especially modern) infrastructure and utilities.
  - — Supporting the provision of business development services (especially technology extension services), investment and export promotion, technology and science parks and export processing zones, and various collaborative efforts of enterprises, especially of small and medium sized enterprises (e.g. consortia).
  - — Providing sound rules and regulations and their enforcement mechanisms (to reward entrepreneurial risk).
  - — Ensuring the quality of governance at the firm and government levels.
- ❑ Make collective, purposive and directed efforts, involving not only the frontline enterprises but also other enterprises, institutions, organizations and governments at different levels, to build a favourable business climate to leverage relationships with foreign partners in GVCs and GPNs for capability building.
- ❑ See the new economic developments in China as an opportunity rather than as a threat for growth. There are clear opportunities for mutual benefits and development between China and other countries in the region, as China's import growth is higher than its export growth in the aggregate intra-regional trade. If this trend continues, those countries undertaking proper restructuring and developing capabilities to match the new competitive requirements should be able to maintain their respective high export growth to China. Be aware that the low labour costs and preferential market access of regional and bilateral trade agreements are no guarantee for industrial and technological upgrading. They can also create high dependency of export earnings on certain products, making a country vulnerable to the changes in the trading regime. For instance, countries like Cambodia and Bangladesh, with high export dependency on garments will face serious adjustment challenges arising from quota elimination and the erosion of preferences from multilateral liberalization in the DDA framework. This issue deserves high priority in the respective national governments' and international community policy agendas.

Second, industrial policy-making is country specific. Each country must design its own strategy and decide what policy tools to use and what institutions and organizations to support. In this respect, the framework conditions and attention given to the role of a national innovation system in a country strategy and policy framework is crucial. The framework conditions for industrial development are political, social and macroeconomic stability; coherence and predictability in the policy environment; and transparency and participation in policymaking. If these conditions are not met, local and foreign investors will not be attracted (UNIDO, 2003). The system of incentives for investors will be distorted, harming the capacity building and capability accumulation.

The Asian Tigers were fully aware of the framework conditions' role but also of the framework imperatives, needed for dynamic industrial development. This imperatives include: *(a)* policies assuring macroeconomic stability; *(b)* policies ensuring resource allocation in accord with dynamic comparative advantages; *(c)* policies assuring rapid accumulation of physical and human capital; *(d)* successful agricultural development; *(e)* enforceable rules and regulation on commerce; *(f)* competent bureaucracy; and *(g)* a recognition of the need to support the innovation and learning needs of firms (UNIDO, ibid.). Yet, diversity exists among the East Asian countries in attainment of these imperatives, which led to a different speed of industrialization and success in upgrading through participating in GVCs.

Therefore, policies that foster productive capacity-building need to be combined and supported with those that foster capability building of variety of institutions and organizations that help enterprises to have better access to information, skills, knowledge and finance, which are not properly supplied by market. Market failure and public-good character of services they provide favours subsidized provision of these services. Many developing countries have established those institutions and organizations but they often operate badly, providing poor quality of services with inadequate equipment, poorly motivated and remunerated staff not responding to demand; with unrealistic objectives; bad management; and a lack of financial resources. Equally, enterprises in developing countries and in low-income countries frequently do not have a clear idea of the services they need, and they have difficulties in assessing the suitability of the services and those offering them. Because of these government and institutional failures, there is a clear need for international community support in this area, underpinned by well−defined proprieties and guidelines (see box 8 on "UNIDO at work"). This also calls for creative policies at the international level and their greater policy coordination.

There are several areas in which these intermediary institutions and organizations can provide support to the real economy. The first area relates to supporting firms' technological efforts and productivity enhancements. The second crucial area concerns the ability to produce according to technical requirements set by foreign clients and markets, most notably internationally agreed standards. Enhancing developing countries' ability to produce in compliance with international standards would stimulate their better integration into the global economy. Moreover, enhancing their ability to comply with international environmental conventions for pollution eradication such as the Montreal Protocol, the Kyoto Protocol and the Stockholm Convention would improve their export

Box 8. UNIDO at work

UNIDO puts among its priorities the fostering of consensus for macroeconomic stability, institutional reform, and open trade and investment. UNIDO helps developing countries to realize the productivity gains through their proactive integration into the rising global trade, capital and technology flows. To this end, UNIDO global forum work and its technical cooperation activities are designed to support developing countries to formulate and put into effect their industrial strategies and policies; and in areas of technology transfer and supply-side capacity building for market access and development.

More specifically, in technology transfer, UNIDO activities include all those dealing with technological adoption, absorption and mastery. In doing this, UNIDO also focuses on the new technologies like environmentally sound technologies, biotechnology, sustainable methods of production, energy efficiency, technology foresight exercises, and implementing various environmentally related international protocols.

In strengthening the supply-side capacity for the trade participation, UNIDO activities include supporting capacity building for the provision of technology extension services in the areas of quality, standards and metrology, sanitary and phyto-sanitary measures, productivity centres; investment and export promotion; supporting the establishment of the Cleaner Production Centres promoting SME networks and access to finance. In all these areas, UNIDO strives to reach integration between conceptualization of the current policy challenges facing developing countries and its approaches to technical cooperation delivery on the ground.

potential and avoid possible future market access barriers, besides the positive effect on local sustainable development. Developing countries thus need new capacities for the management of clean technologies, handling of alternative chemicals and adoption of safety practices to remove the risk to human life and the environment.

The third area embraces technical education and training system. The fourth area of support focuses on the provision of information, and market intelligence services, which will warrant the long-term survival of small firms in the global production and trade system.

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Annex A UNIDO Scoreboard database: structure of manufactured exports

Table A-1. Technology classification of exports

United Nations Commodity Trade Statistics (COMTRADE) database. The technological classification of trade is based on the Standard International Trade Classification (SITC), Revision 2

Technology classification of exports	*SITC Rev. 2*
Resource based exports	01 (excl. 011), 023, 024, 035, 037, 046, 047, 048, 056, 058, 06, 073, 098, 1 (excl.121), 233, 247, 248, 25, 264, 265, 269, 323, 334, 335, 4, 51 (excl. 512 and 513), 52 (excl. 524), 53 (excl. 533), 551, 592, 62, 63, 641, 66 (excl. 665 and 666), 68
Low technology exports	61, 642, 65 (excl. 653), 665, 666, 67 (excl. 671, 672 and 678), 69, 82, 83, 84, 85, 89 (excl. 892 and 896)
Medium technology exports	266, 267, 512, 513, 533, 55 (excl. 551), 56, 57, 58, 59 (excl. 592), 653, 671, 672, 678, 711, 713, 714, 72, 73, 74, 762, 763, 772, 773, 775, 78, 79 (excl. 792), 81, 872, 873, 88 (excl. 881), 95
High technology exports	524, 54, 712, 716, 718, 75, 761, 764, 77 (excl. 772, 773 and 775), 792, 871, 874, 881

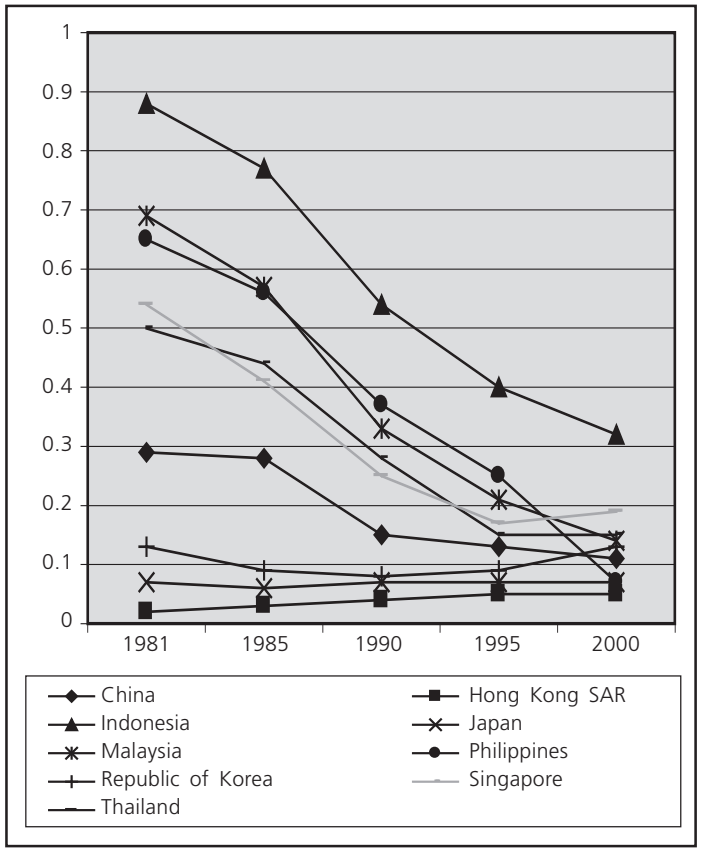
Source: UNIDO *Industrial Development Report 2004*.

Table A-2a. Share of Resource-Based Exports in Manufactured Exports (East Asia)

Country	*1981*	*1985*	*1990*	*1995*	*2000*
China	0.29	0.28	0.15	0.13	0.11
Hong Kong SAR	0.02	0.03	0.04	0.05	0.05
Indonesia	0.88	0.77	0.54	0.40	0.32
Japan	0.07	0.06	0.07	0.07	0.07
Malaysia	0.69	0.57	0.33	0.21	0.14
Philippines	0.65	0.56	0.37	0.25	0.07
Republic of Korea	0.13	0.09	0.08	0.09	0.13
Singapore	0.50	0.44	0.28	0.15	0.15
Thailand	0.54	0.41	0.25	0.17	0.19

Source: UNIDO Scoreboard database 2003/2004.

Figure A-2a. Share of Resource-Based Exports in Manufactured Exports (East Asia)



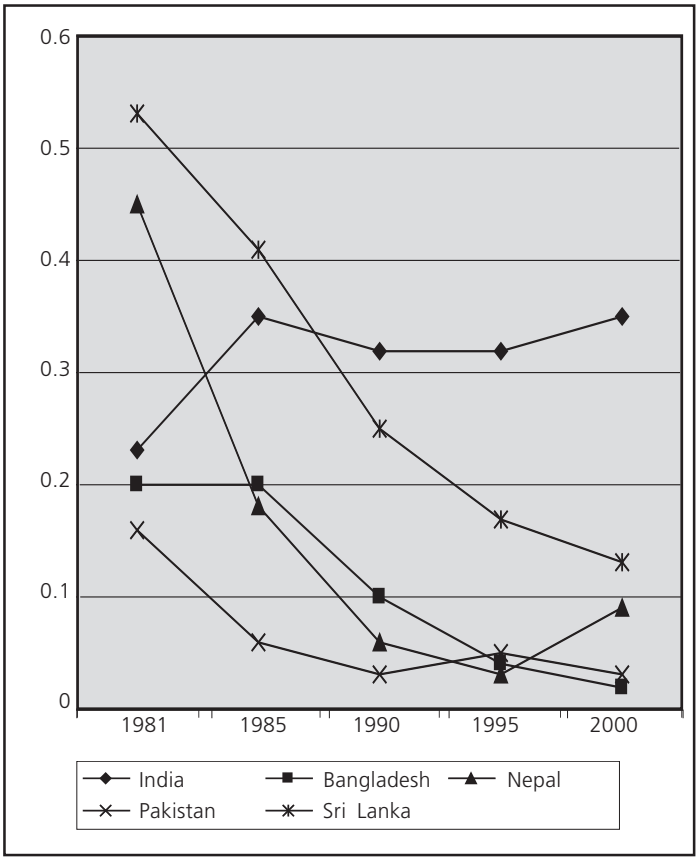
Source: Table A-2a.

Table A-2b. Share of Resource-Based Exports in Manufactured Exports (South Asia)

Country	*1981*	*1985*	*1990*	*1995*	*2000*
India	0.23	0.35	0.32	0.32	0.35
Bangladesh	0.20	0.20	0.10	0.04	0.02
Nepal	0.45	0.18	0.06	0.03	0.09
Pakistan	0.16	0.06	0.03	0.05	0.03
Sri Lanka	0.53	0.41	0.25	0.17	0.13

Source: UNIDO Scoreboard database 2003/2004.

Figure A-2b. Share of Resource-Based Exports in Manufactured Exports (South Asia)



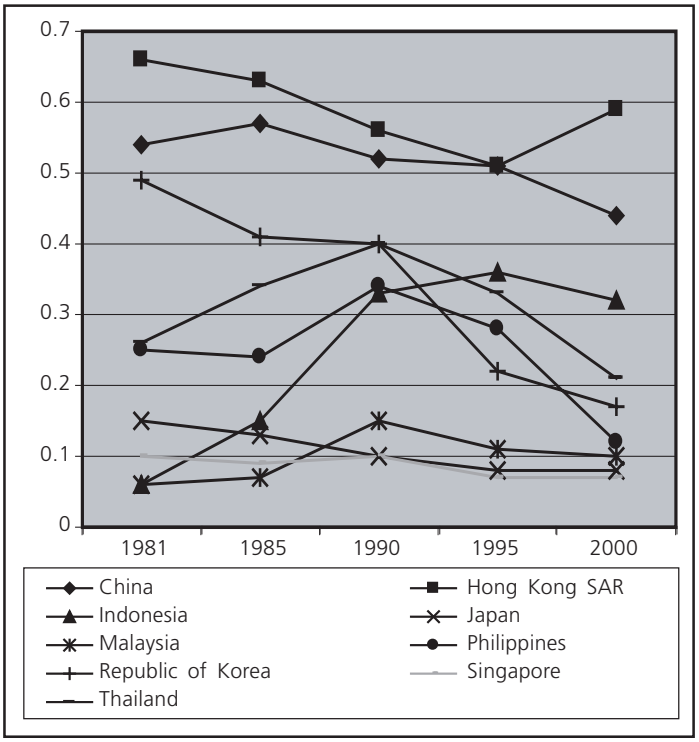
Source: Table A-2b.

Table A-3a. Share of Low-Tech Exports in Manufactured Exports (East Asia)

Country	*1981*	*1985*	*1990*	*1995*	*2000*
China	0.54	0.57	0.52	0.51	0.44
Hong Kong SAR	0.66	0.63	0.56	0.51	0.59
Indonesia	0.06	0.15	0.33	0.36	0.32
Japan	0.15	0.13	0.10	0.08	0.08
Malaysia	0.06	0.07	0.15	0.11	0.10
Philippines	0.25	0.24	0.34	0.28	0.12
Republic of Korea	0.49	0.41	0.40	0.22	0.17
Singapore	0.10	0.09	0.10	0.07	0.07
Thailand	0.26	0.34	0.40	0.33	0.21

Source: UNIDO Scoreboard database 2003/2004.

Figure A-3a. Share of Low-Tech Exports in Manufactured Exports (East Asia)



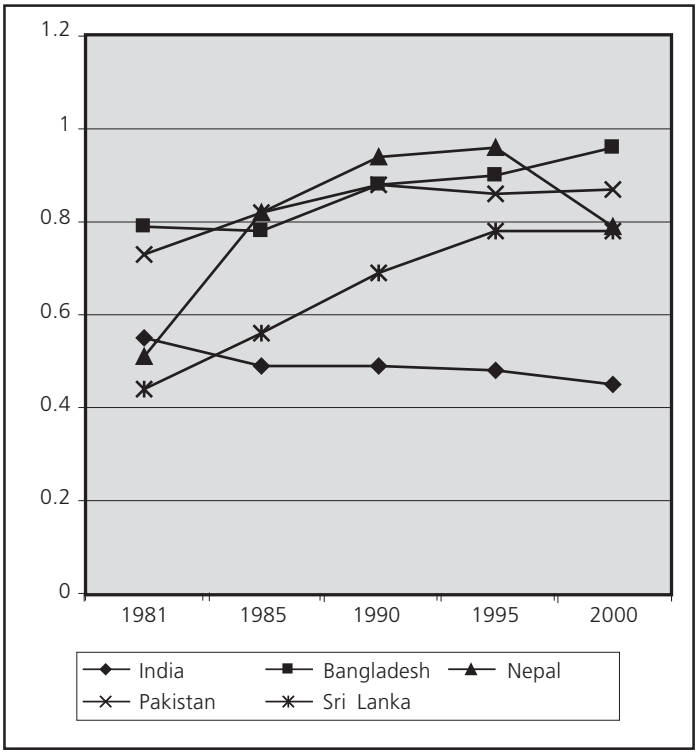
Source: Table A-3a.

Table A-3b. Share of Low-Tech Exports in Manufactured Exports (South Asia)

Country	*1981*	*1985*	*1990*	*1995*	*2000*
India	0.55	0.49	0.49	0.48	0.45
Bangladesh	0.79	0.78	0.88	0.9	0.96
Nepal	0.51	0.82	0.94	0.96	0.79
Pakistan	0.73	0.82	0.88	0.86	0.87
Sri Lanka	0.44	0.56	0.69	0.78	0.78

Source: UNIDO Scoreboard database 2003/2004.

Figure A-3b. Share of Low-Tech Exports in Manufactured Exports (South Asia)



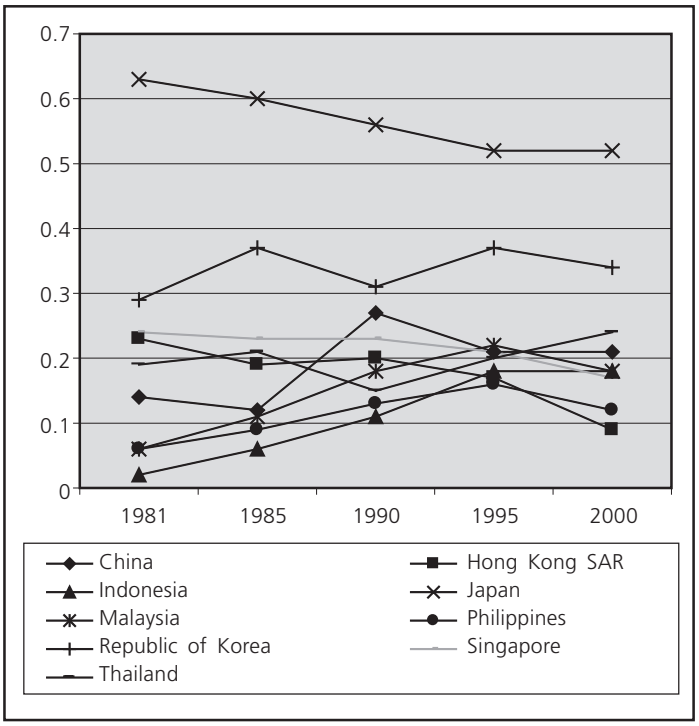
Source: Table A-3b.

Table A-4a. Share of Medium-Tech Exports in Manufactured Exports (East Asia)

Country	*1981*	*1985*	*1990*	*1995*	*2000*
China	0.14	0.12	0.27	0.21	0.21
Hong Kong SAR	0.23	0.19	0.20	0.17	0.09
Indonesia	0.02	0.06	0.11	0.18	0.18
Japan	0.63	0.60	0.56	0.52	0.52
Malaysia	0.06	0.11	0.18	0.22	0.18
Philippines	0.06	0.09	0.13	0.16	0.12
Republic of Korea	0.29	0.37	0.31	0.37	0.34
Singapore	0.24	0.23	0.23	0.21	0.17
Thailand	0.19	0.21	0.15	0.20	0.24

Source: UNIDO Scoreboard database 2003/2004.

Figure A-4a. Share of Medium-Tech Manufactured Exports (East Asia)



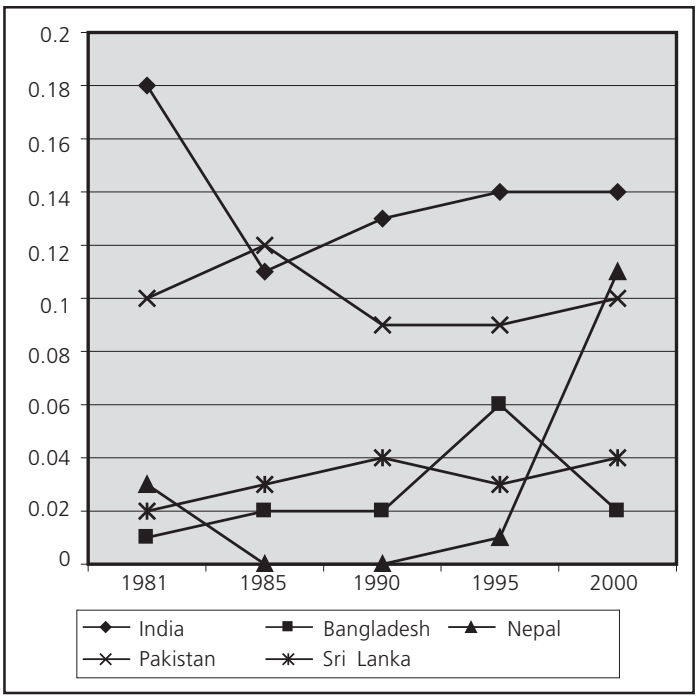
Source: Table A-4a.

Table A-4b. Share of Medium-Tech Exports in Manufactured Exports (South Asia)

Country	*1981*	*1985*	*1990*	*1995*	*2000*
India	0.18	0.11	0.13	0.14	0.14
Bangladesh	0.01	0.02	0.02	0.06	0.02
Nepal	0.03	0.00	0.00	0.01	0.11
Pakistan	0.10	0.12	0.09	0.09	0.10
Sri Lanka	0.02	0.03	0.04	0.03	0.04

Source: UNIDO Scoreboard database 2003/2004.

Figure A-4b. Share of Medium-Tech Manufactured Exports (South Asia)



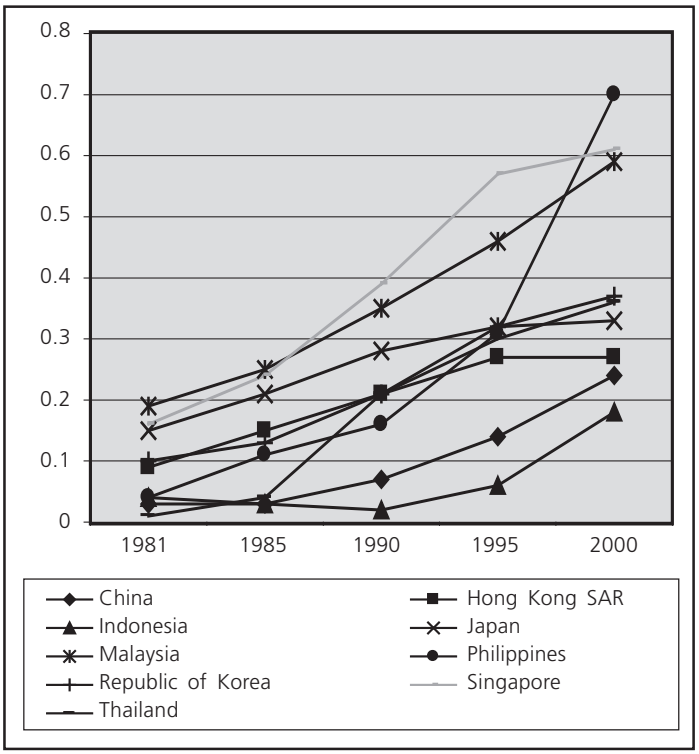
Source: Table A-4b.

Table A-5a. Share of High-Tech Exports in Manufactured Exports (East Asia)

Country	*1981*	*1985*	*1990*	*1995*	*2000*
China	0.03	0.03	0.07	0.14	0.24
Hong Kong SAR	0.09	0.15	0.21	0.27	0.27
Indonesia	0.04	0.03	0.02	0.06	0.18
Japan	0.15	0.21	0.28	0.32	0.33
Malaysia	0.19	0.25	0.35	0.46	0.59
Philippines	0.04	0.11	0.16	0.31	0.70
Republic of Korea	0.10	0.13	0.21	0.32	0.37
Singapore	0.16	0.24	0.39	0.57	0.61
Thailand	0.01	0.04	0.21	0.30	0.36

Source: UNIDO Scoreboard database 2003/2004.

Figure A-5a. Share of High-Tech Exports in Manufactured Exports (East Asia)



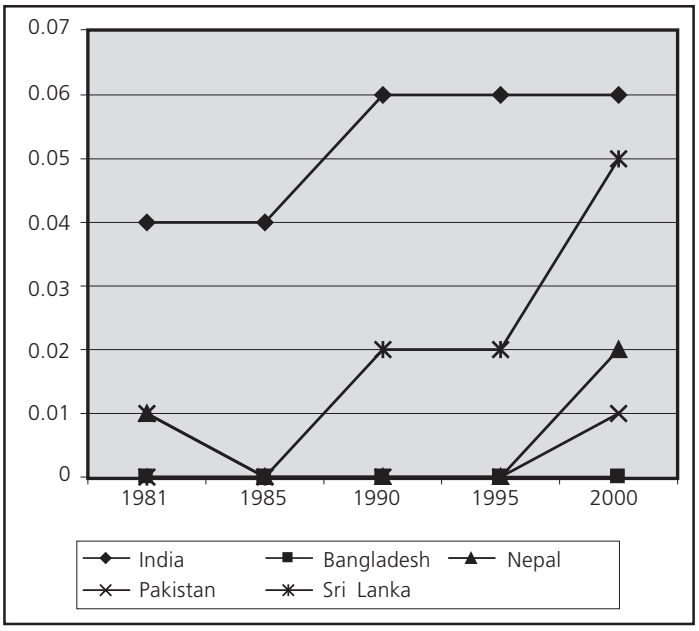
Source: Table A-5a.

Table A-5b. Share of High-Tech Exports in Manufactured Exports (South Asia)

Country	*1981*	*1985*	*1990*	*1995*	*2000*
India	0.04	0.04	0.06	0.06	0.06
Bangladesh	0	0	0	0	0
Nepal	0.01	0	0	0	0.02
Pakistan	0.01	0	0	0	0.01
Sri Lanka	0	0	0.02	0.02	0.05

Source: UNIDO Scoreboard database 2003/2004.

Figure A-5b. Share of High-Tech Exports in Manufactured Exports (South Asia)



Source: Table A-5b.

Annex B I. UNIDO Scoreboard database: the Competitive Industrial Performance Index (CIP)

Note: The competitive industrial performance index (CIP) is constructed from six performance indicators including MVA per capita; manufactured exports per capita; share of medium- and high-tech activities in MVA; share of medium- and high-tech products in manufactured exports, share of MVA in GDP; and share of manufactured exports in total exports.

Table B-1a. Competitive Industrial Performance Index (East Asia)

	1980		1990		2000	
Country	*Index*	*Ranking*	*Index*	*Ranking*	*Index*	*Ranking*
China	0.21	49	0.32	28	0.38	30
Hong Kong SAR	0.44	16	0.43	21	0.34	35
Indonesia	0.12	81	0.19	57	0.29	49
Japan	0.59	5	0.66	4	0.62	6
Malaysia	0.24	40	0.37	24	0.49	17
Philippines	0.23	42	0.24	45	0.38	31
Republic of Korea	0.34	23	0.44	18	0.54	11
Singapore	0.68	2	0.77	1	0.83	1
Taiwan Province of China	0.43	18	0.5	15	0.55	10
Thailand	0.21	47	0.28	34	0.39	27

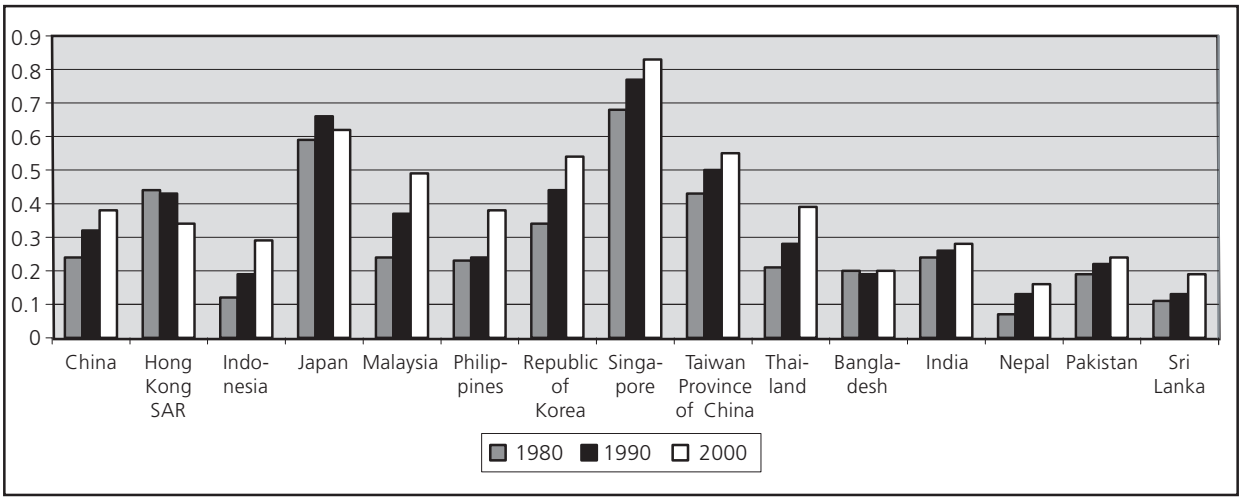
Source: UNIDO *Industrial Development Report 2004*.

Table B-1b. Competitive Industrial Performance Index (South Asia)

	1980		1990		2000	
Country	*Index*	*Ranking*	*Index*	*Ranking*	*Index*	*Ranking*
Bangladesh	0.2	50	0.19	60	0.2	77
India	0.24	39	0.26	38	0.28	56
Nepal	0.07	97	0.14	78	0.16	101
Pakistan	0.19	54	0.22	50	0.24	68
Sri Lanka	0.11	85	0.13	86	0.19	86

Source: UNIDO *Industrial Development Report 2004*.

Figure B-1a. Competitive Industrial Performance Index (East Asia and South Asia)



Source: Table B-1a.b.

II. Drivers of industrial performance

Note: Structural drivers of UNIDO scoreboard include technology in generic sense (domestic technology effort measured by R&D and acquiring foreign technology through FDI and licensing), skills and modern infrastructure.

Table B-2a. Foreign Direct Investment (East Asia)

	Per capita (dollars)		*Total value (billions of dollars)*		*Share of gross domestic investment (%)*		*Share of GDP (%)*	
Country	*93-95*	*81-85*	*93-95*	*81-85*	*93-95*	*81-85*	*93-95*	*81-85*
China	30.1	0.8	37.8	0.93	13.54	0.87	5.51	0.31
Hong Kong, SAR	728	103	2.75	1.34	10.24	6.9	1.96	n.a.
Indonesia	19.8	1.5	3.66	0.22	6.16	1	1.9	0.27
Japan	7.1	2.8	1.07	0.37	0.07	0.1	0.02	0.03
Malaysia	230	73.6	4.63	1.1	14.1	10.91	5.73	3.81
Philippines	20.1	1.2	1.54	0.05	8.46	0.67	2.01	0.18
Republic of Korea	36.8	2.9	1.61	0.13	0.99	0.47	0.36	0.14
Singapore	2536	563	8.2	1.53	26.54	17.91	9.57	8.36
Taiwan Province of China	74.5	10	1.74	0.45	2.78	1.5	0.66	n.a.
Thailand	38	5.6	2.45	0.28	4.07	2.49	1.48	0.72

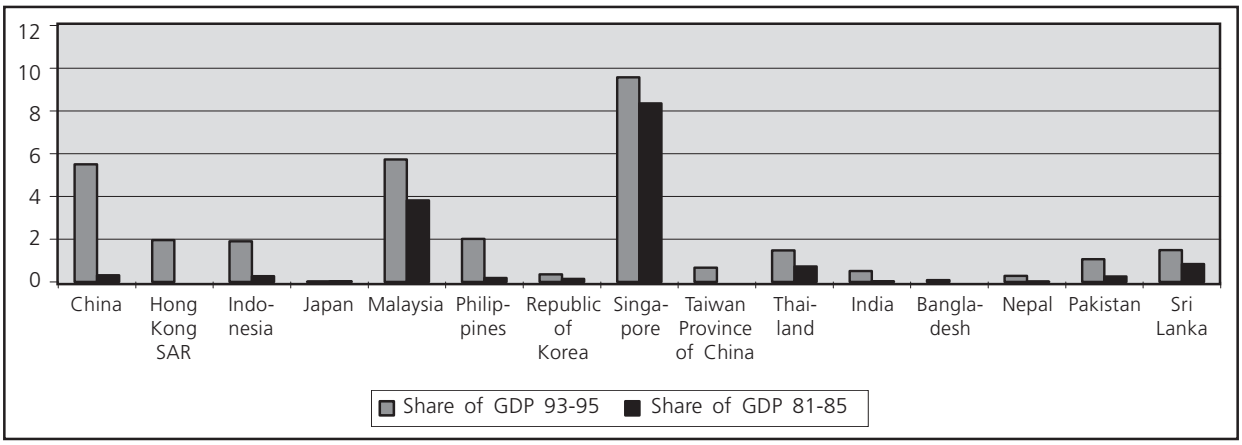
Source: UNIDO *Industrial Development Report 2003*.

Table B-2b. Foreign Direct Investment (South Asia)

	Per capita (dollars)		*Total value (billions of dollars)*		*Share of gross domestic investment (%)*		*Share of GDP (%)*	
Country	*93-95*	*81-85*	*93-95*	*81-85*	*93-95*	*81-85*	*93-95*	*81-85*
India	2.1	0.1	1.64	0.06	2.16	0.12	0.51	0.03
Bangladesh	0.3	n.a.	0.03	n.a.	n.a.	n.a.	0.09	n.a.
Nepal	0.6	n.a.	n.a.	n.a.	1.18	0.03	0.28	0.01
Pakistan	5.1	0.9	0.65	0.09	5.66	1.38	1.06	0.26
Sri Lanka	10.6	2.7	0.19	0.05	5.91	2.99	1.49	0.83

Source: UNIDO *Industrial Development Report 2003*.

Figure B-2a. Foreign Direct Investment (East Asia and South Asia)



Source: Table B-2a. b.

Table B-3a. Modern infrastructure (number of telephones) (East Asia)

	Per 1000 people		Total number (thousands)	
Country	*1998*	*1985*	*1998*	*1985*
China	69.6	3	86230	3120
Hong Kong SAR	557.7	323.4	3729.2	1764.4
Indonesia	27	3.7	5499.9	598.9
Japan	502.7	375.2	63540	45300
Malaysia	197.6	61.5	4383.7	963.6
Philippines	37	9.3	2782.6	510.3
Republic of Korea	432.7	159.7	20088	6517.5
Singapore	562	324.3	1777.9	805.3
Taiwan Province of China	420.1	228.5	9174.8	4228
Thailand	83.5	12.3	5112.8	630.8

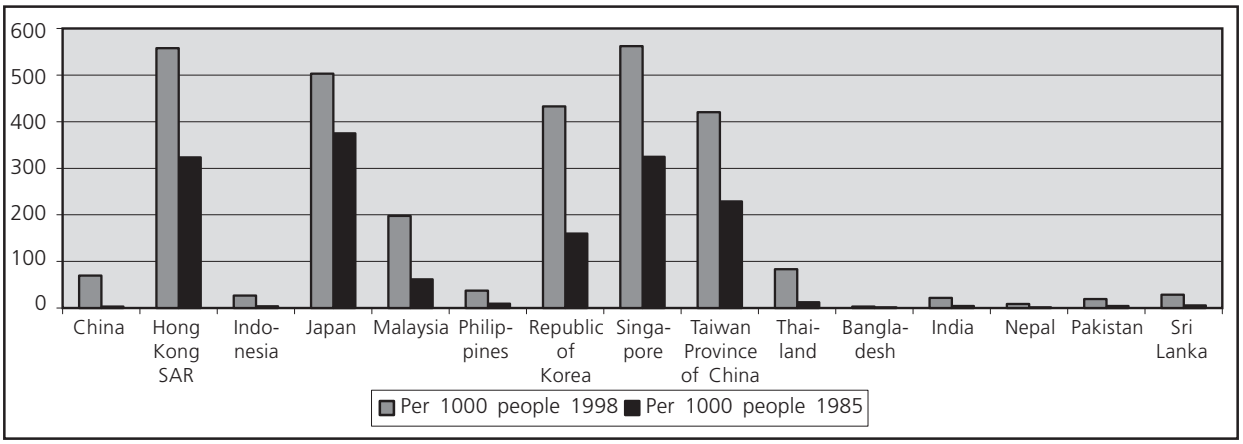
Source: UNIDO *Industrial Development Report 2003*.
Note: Infrastructure is approximated by the number of telephones.

Table B-3b. Modern infrastructure (number of telephones) (South Asia)

	Per 1000 people		Total number (thousands)	
Country	*1998*	*1985*	*1998*	*1985*
Bangladesh	3	1.5	380.6	150.6
India	22	4.1	21538	3174.7
Nepal	8.5	1.2	194	20.1
Pakistan	19.4	4.6	2549.8	440.2
Sri Lanka	28.4	5.4	532.7	86.2

Source: UNIDO *Industrial Development Report 2003*.
See note B-3a.

Figure B-3a. Modern infrastructure (number of telephones) (East Asia and South Asia)



Source: Table B-3a. b.

Table B-4a. Tertiary technical education (East Asia)

	Share of population (per cent)		*Number (thousands of people)*	
Country	*1998*	*1985*	*1998*	*1985*
China	0.10	0.08	1221	821.5
Hong Kong SAR	0.49	0.49	30.2	27.5
Indonesia	0.23	0.08	439.1	137.3
Japan	0.64	0.41	808.2	501.6
Malaysia	0.13	0.08	26.7	13.8
Philippines	0.55	0.47	387.3	271.5
Republic of Korea	1.65	1.65	742.5	320.7
Singapore	0.47	0.71	14.1	18.1
Taiwan Province of China	1.06	0.59	226.8	115.7
Thailand	0.19	0.16	110.5	81.8

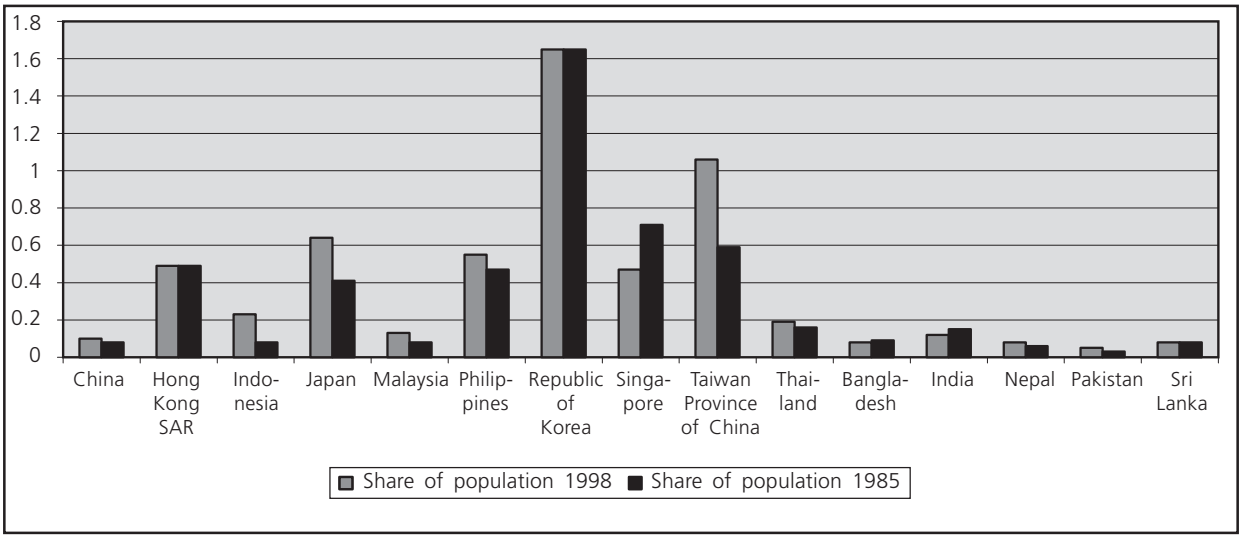
Source: UNIDO *Industrial Development Report 2003*.

Table B-4b. Tertiary technical education (South Asia)

	Share of population (per cent)		*Number (thousands of people)*	
Country	*1998*	*1985*	*1998*	*1985*
Bangladesh	0.08	0.09	90	97.9
India	0.12	0.15	1086.3	1233.8
Nepal	0.08	0.06	16	10.5
Pakistan	0.05	0.03	63.4	28.5
Sri Lanka	0.08	0.08	15.4	13.8

Source: UNIDO *Industrial Development Report 2003*.

Figure B-4a. Tertiary technical education (East Asia and South Asia)



Source: Table B-4a. b.

Table B-5a. Royalty and Licence Payments Abroad (East Asia)

Country	Per capita (dollars) 1998	Per capita (dollars) 1985	Total value (millions of dollars) 1998	Total value (millions of dollars) 1985	Share of GNP (%) 1998	Share of GNP (%) 1985
China	0.3	n.a.	420	11	0.045	0.004
Hong Kong SAR	184.7	101.2	1235	552.4	0.781	1.584
Indonesia	4.9	2.4	1002	385	0.767	0.465
Japan	70.8	18.8	8947.3	2270	0.219	0.168
Malaysia	107.8	2.6	2392	41.2	2.942	0.142
Philippines	2.1	0.3	158	17	0.2	0.057
Republic of Korea	51	7.9	2369.3	322.8	0.594	0.354
Singapore	559.2	191.1	1769	474.5	1.852	2.589
Taiwan Province of China	65	9.3	1419	172	0.527	0.168
Thailand	13.1	0.9	804	45.5	0.61	0.119

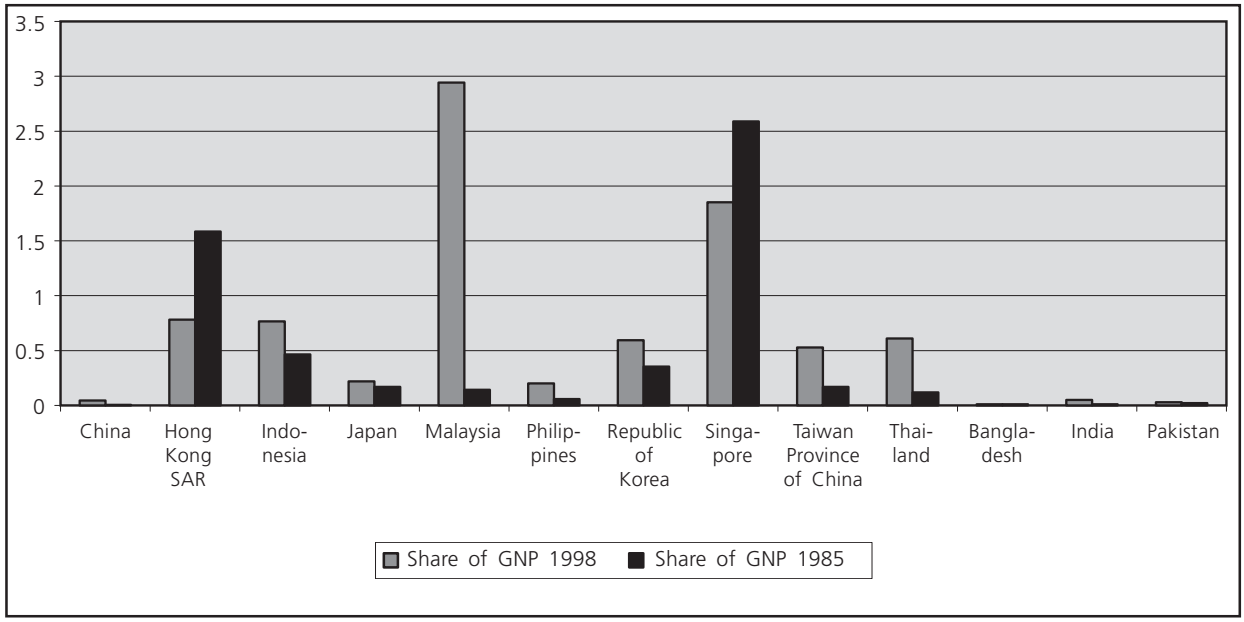
Source: UNIDO *Industrial Development Report 2003*.

Table B-5b. Royalty and Licence Payments Abroad (East Asia)

Country	Per capita (dollars) 1998	Per capita (dollars) 1985	Total value (millions of dollars) 1998	Total value (millions of dollars) 1985	Share of GNP (%) 1998	Share of GNP (%) 1985
Bangladesh	n.a.	n.a.	5.1	1.2	0.01	0.01
India	0.2	n.a.	200.8	25.1	0.05	0.01
Pakistan	0.1	0.1	19.7	6.7	0.03	0.02

Source: UNIDO *Industrial Development Report 2003*.

Figure B-5a. Royalty and Licence Payments Abroad (East Asia and South Asia)



Source: Table B-5a. b.

Table B-6a. Enterprise–Financed Research and Development (East Asia)

	Per capita (dollars)		*Total value (millions of dollars)*		*Share of GNP (%)*	
Country	*1998*	*1985*	*1998*	*1985*	*1998*	*1985*
China	0.9	n.a.	1.1	n.a.	0.16	n.a.
Hong Kong SAR	1.8	n.a.	0.01	n.a.	0.01	n.a.
Indonesia	0.8	0.1	0.15	0.01	0.08	0.01
Japan	858.4	192.3	107.68	23.22	2.08	1.72
Malaysia	6.7	0.2	0.14	0.01	0.17	0.01
Philippines	0.1	0.1	0.01	0	0.01	0.01
Republic of Korea	211.2	10.8	9.5	0.44	2.1	0.48
Singapore	198.4	14.5	0.59	0.04	0.69	0.2
Taiwan Province of China	122.5	33.3	2.61	0.62	0.99	0.6
Thailand	0.3	0.1	0.02	0.01	0.01	0.02

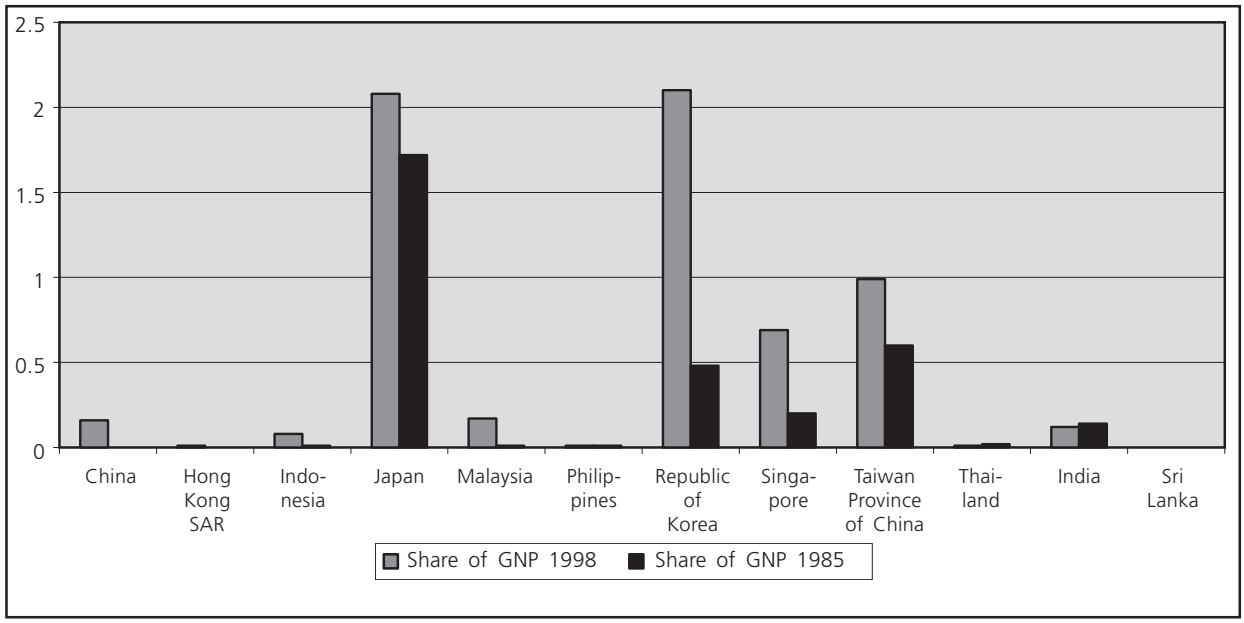
Source: UNIDO *Industrial Development Report 2003*.

Table B-6b. Enterprise–Financed Research and Development (South Asia)

	Per capita (dollars)		*Total value (millions of dollars)*		*Share of GNP (%)*	
Country	*1998*	*1985*	*1998*	*1985*	*1998*	*1985*
India	0.4	0.4	0.4	0.3	0.12	0.14
Sri Lanka	0.1	n.a.	0.01	n.a.	0	n.a.

Source: UNIDO *Industrial Development Report 2003*.

Figure B-6a. Enterprise–Financed Research and Development (South Asia)



Source: Table B-6a. b.

Annex C UNIDO Scoreboard database: manufacturing value added

Table C-1. Technology Classification of MVA

Technology classification of MVA	*SITC Rev. 2*
Resource based manufacturing	31, 331, 341, 353, 354, 355, 362, 369
Low technology manufacturing	32, 332, 361, 381, 390
Medium- and high technology manufacturing	342, 351, 352, 356, 37, 38 (excl. 381)
High technology manufacturing	3522, 3852, 3832, 3845, 3849, 385

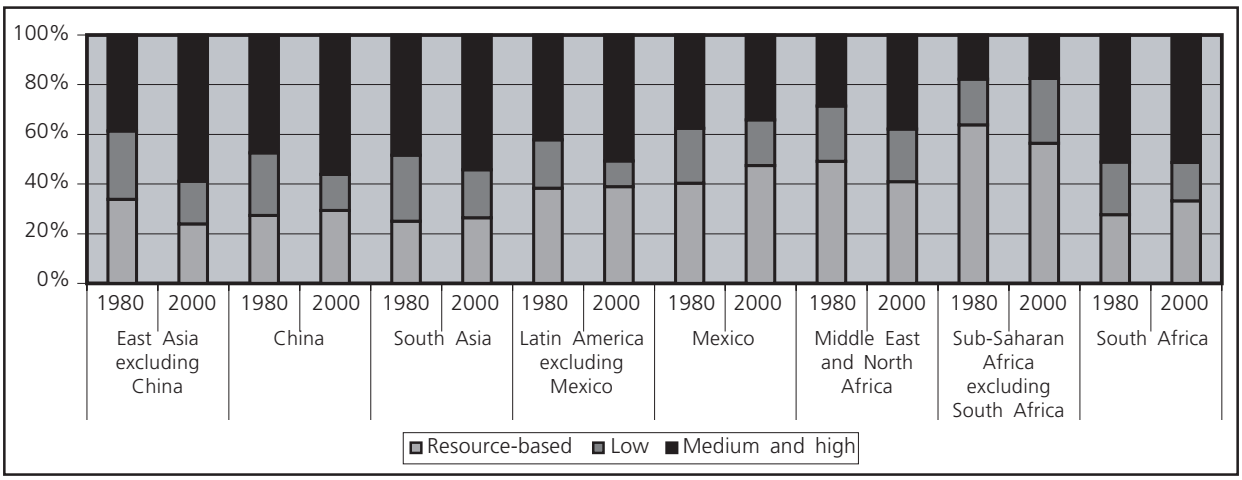
Source: UNIDO *Industrial Development Report 2004*.

Table C-2. Technology structure of MVA (per cent)

		Share in MVA (per cent)		
Region or country	*Year*	*Resource-based*	*Low*	*Medium and high*
East Asia excluding China	1980	33.8	27.5	38.7
	2000	24	17.2	58.9
China	1980	27.3	25.3	47.4
	2000	29.3	14.5	56.1
South Asia	1980	25	26.6	48.4
	2000	26.5	19.2	54.3
Latin America excluding Mexico	1980	38.3	19.5	42.2
	2000	39	10.3	50.7
Mexico	1980	40.4	22.1	37.6
	2000	47.5	18.3	34.2
Middle East and North Africa	1980	49.1	22.3	28.6
	2000	40.9	21.2	37.9
Sub-Saharan Africa excluding South Africa	1980	63.8	18.5	17.7
	2000	56.4	26.2	17.4
South Africa	1980	27.7	21.2	51.1
	2000	33.3	15.4	51.3

Source: UNIDO Industrial Development Report 2004.

Technology structure of MVA (per cent)



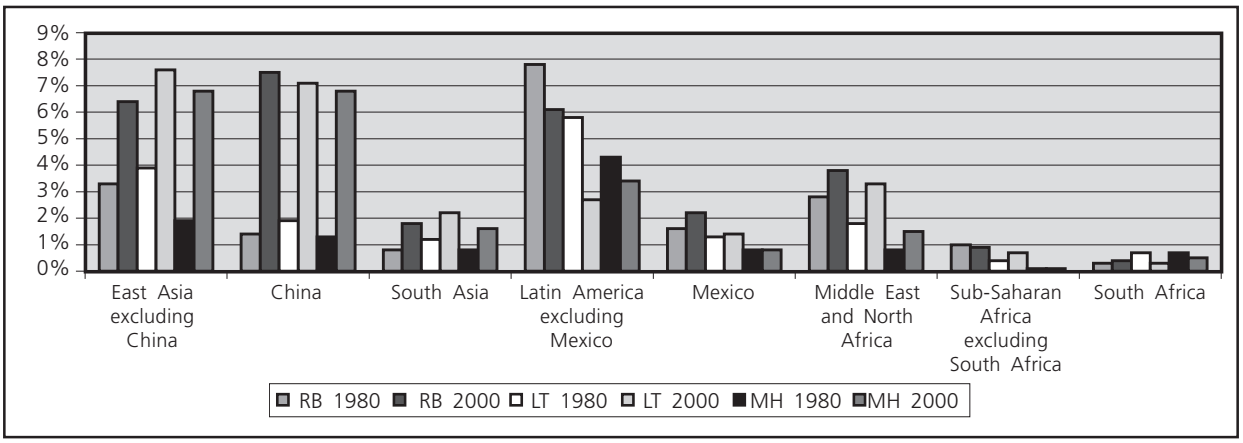
Source: Table C-2.

Table C-3. World shares of MVA by technology categories (per cent)

	Resource-based (RB)		*Low (LT)*		*Medium and high (MH)*	
Region or country	*1980*	*2000*	*1980*	*2000*	*1980*	*2000*
East Asia excluding China	3.3	6.4	3.9	7.6	1.9	6.8
China	1.4	7.5	1.9	7.1	1.3	6.8
South Asia	0.8	1.8	1.2	2.2	0.8	1.6
Latin America excluding Mexico	7.8	6.1	5.8	2.7	4.3	3.4
Mexico	1.6	2.2	1.3	1.4	0.8	0.8
Middle East and North Africa	2.8	3.8	1.8	3.3	0.8	1.5
Sub-Saharan Africa excluding South Africa	1	0.9	0.4	0.7	0.1	0.1
South Africa	0.3	0.4	0.7	0.3	0.7	0.5

Source: UNIDO *Industrial Development Report 2004*.

World shares of MVA by technology categories (per cent)



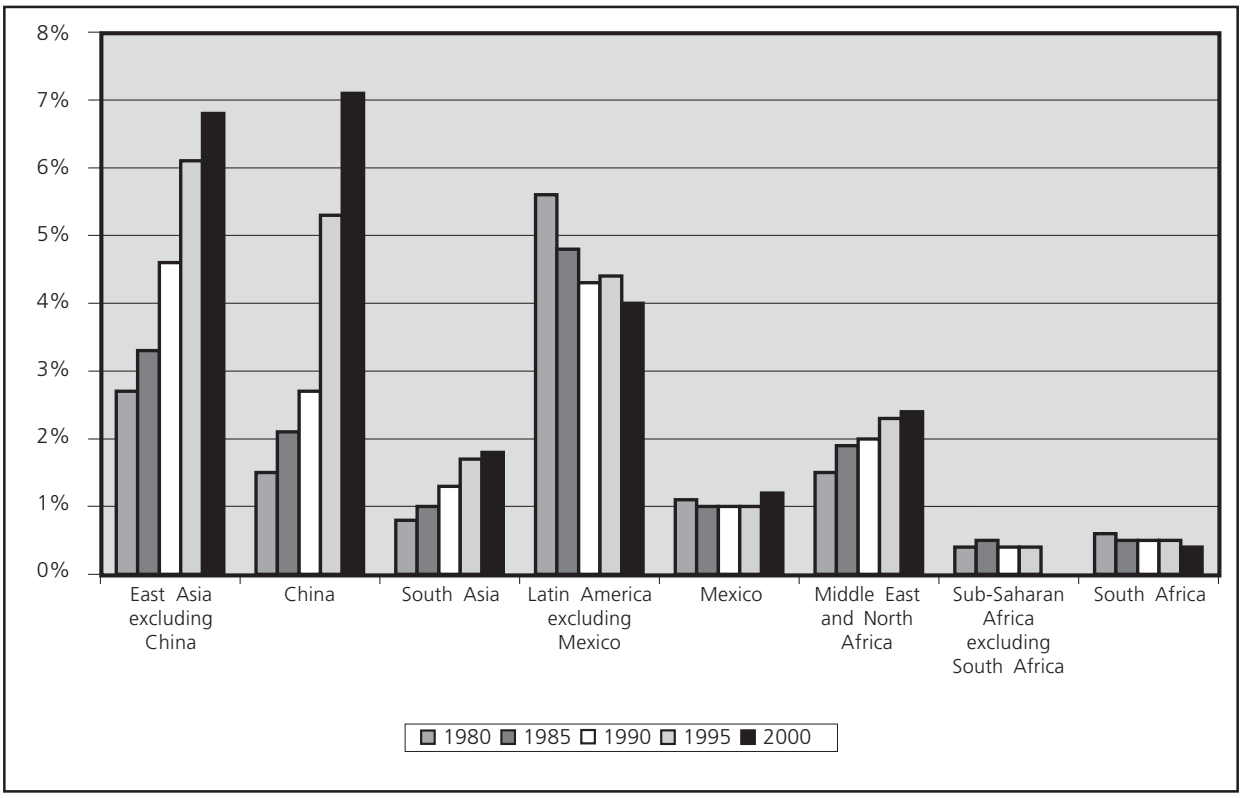
Source: Table C-3.

Table C-4. MVA shares in world, 1980-2000 (per cent)

Region or county	*1980*	*1985*	*1990*	*1995*	*2000*
East Asia excluding China	2.7	3.3	4.6	6.1	6.8
China	1.5	2.1	2.7	5.3	7.1
South Asia	0.8	1.0	1.3	1.7	1.8
Latin America excluding Mexico	5.6	4.8	4.3	4.4	4.0
Mexico	1.1	1.0	1.0	1.0	1.2
Middle East and North Africa	1.5	1.9	2.0	2.3	2.4
Sub-Saharan Africa excluding South Africa	0.4	0.5	0.4	0.4	0
South Africa	0.6	0.5	0.5	0.5	0.4

Source: UNIDO *Industrial Development Report 2004*.

MVA shares in world, 1980-2000 (per cent)



Source: Table C-4.

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