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Quality of Latin American and Caribbean industrialization and integration into the global economy

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Abstract

Despite an increase in manufacturing activity in Latin America and the Caribbean, the growth in value-added generated by exports of manufactures has been disappointing in most cases. Developing Asia excels not only in the volume of trade in which the manufacturing sector serves as its primary driving force but also in the generation of manufacturing value added (MVA). Irrespective of growing manufactured exports, the Latin American economies have not experienced the kind of dynamic restructuring of domestic production and export patterns that would allow investment to become an engine of growth.

Export dynamism is almost always analyzed in gross export values, not in value-added terms. Value-added tends to be much lower particularly where developing countries are involved in low-skill, low-value added assembly stages of global production networks, as in electronics and apparels. The participation in the internationally integrated production systems that produce high-tech goods is not synonymous to the participation in high-technology production processes. Thus, participation in the labor-intensive segments of international production chains neither automatically brings about technology trade and technological upgrading and productivity growth as well as the technological spillovers needed to move up in the production chain. In order to harness trade as a driving force of growth not only for the manufacturing sector but also natural resource-based ones and services, Latin America and the Caribbean should adopt more proactive, forward–looking national policies, concurrent with the rapidly changing world marketplace, under a strong alliance between the public and private sectors.

Introduction

A number of ECLAC documents have shown that, in order to establish a positive link between trade and economic growth, it is not sufficient merely to "open-up" and "integrate" national markets into the world economy; it is also necessary to enhance the quality of this integration (ECLAC 1990, 1995, 2002, 2004, 2006a, 2008). The traditional criteria used for measuring the quality of an economy's international linkages include product and market diversification and technology intensity, which, though important, are not necessarily adequate indicators for such purposes. Other criteria that should receive more attention are value added of exports and the production linkages generated by export activities within the domestic economy, whether in manufacturing, the primary sector or the service sector.

ECLAC also shares the view commonly expressed in recent literature on growth and trade that the propelling force of development must be the dynamism and competitiveness of the national economy. The endogenous nature of value creation and knowledge absorption generates dynamic economic growth, which later translates into a rapidly growing and diversifying export sector. The dynamics that drives growth is not essentially linked to static comparative advantages; instead, it is the dynamics that leads the country to gradually diversify its investment into a whole range of new activities, including export-related sectors.

This perception of development is different from the usual export-led growth model, which emphasizes trade policy reform as the basis for allowing the economy to respond to external demand, via adjustment of relative prices and reduction of anti-export biases. Instead, structural transformation stimulated by national efforts has a strong influence on the evolution of comparative advantage and is a motor of economic growth; it should not, however, be considered the automatic by-product

of an outward-oriented strategy and sound macroeconomic policies. Industries to sustain the economy of the next generation (i.e., dynamic industrial and trade sectors) will not emerge automatically from the adjustment process or through the activities of the private sector only. From this perspective, trade liberalization must be accompanied by a set of policies for the economy as a whole to achieve international competitiveness, based on internal structural and productive upgrading. For exports and imports to function as a cumulative process of learning and technology absorption both for local traders and for the country as a whole, the government should support the private sector by ensuring the public good aspect of international insertion. Comparative advantages can be created "endogenously" by national policies to exploit static advantages and create new advantages.

Over the past two decades, the region as a whole has exhibited one of the world highest growth rates in merchandise trade and a radical change in the composition of its exports. Nonetheless, macroeconomic stabilization and structural reforms in the past have tended to reinforce "optimum" allocation of resources under the existing industrial and trade structures and technological level of the countries in the region, which specialize in a limited number, though increasing, of primary products and light industry of low value-added for their exports. Its quality in services trade has been also disappointing when compared with Asian counterparts. It seems that the region's three characteristic patterns of linkage —one based on natural resources for South America, another based on maquila activities for Mexico and Central America, and the other based on services for the Caribbean— have not yet produced the expected results, nor has an endogenous process of assimilation and dissemination of knowledge has arisen, which could enable countries to quickly produce a diversified supply of goods and services for export.

The experience of a number of countries shows that it is possible to diversify exports and incorporate technology and knowledge with the help of changes in the production sector and economic growth. Australia, Finland, Ireland, Malaysia, New Zealand, the Republic of Korea, Singapore and Sweden have demonstrated the value of proactive, forward–looking national and sectoral policies inspired by long–term adaptive strategies for competing in the world marketplace (ECLAC 2008). These examples show that strategies are more likely to succeed when they involve a strong alliance between the public and private sectors that withstands changes in government administrations and thus makes it possible to implement those strategies on the basis of a long–term time horizon.

I. Trade Dynamism of Latin American and Caribbean Countries in the World Context

Deleveloping Asia excels not only in the volume of trade in which the manufacturing sector serves as its primary driving force but also in the generation of manufacturing value added (MVA). The share of Developing Asia in world exports of manufactures increased to 20% in 2000-2005 on average. The share of Latin America also slightly increased to 4.6%. What is striking is that the MVA share for Developing Asia reached 15.8% of world total in 2000-2005. In contrast, Latin America's share in world MVA has declined somewhat over the years, contributing only 6.5% to world total, share not far from its share in world manufactured exports. In this region, Brazil and Mexico each contribute close to 1.7% of world MVA total. In short, Developing Asia as a group has been able to progress on both fronts, not only in increasing the export values of manufactures but also the manufacturing value added in the world economy.

A. Links between exports and growth

The causality between growth and exports is not straightforward and is difficult to determine. Moreover, the relationship between exports and growth observed among countries is quite heterogeneous.[1] However, as observed in

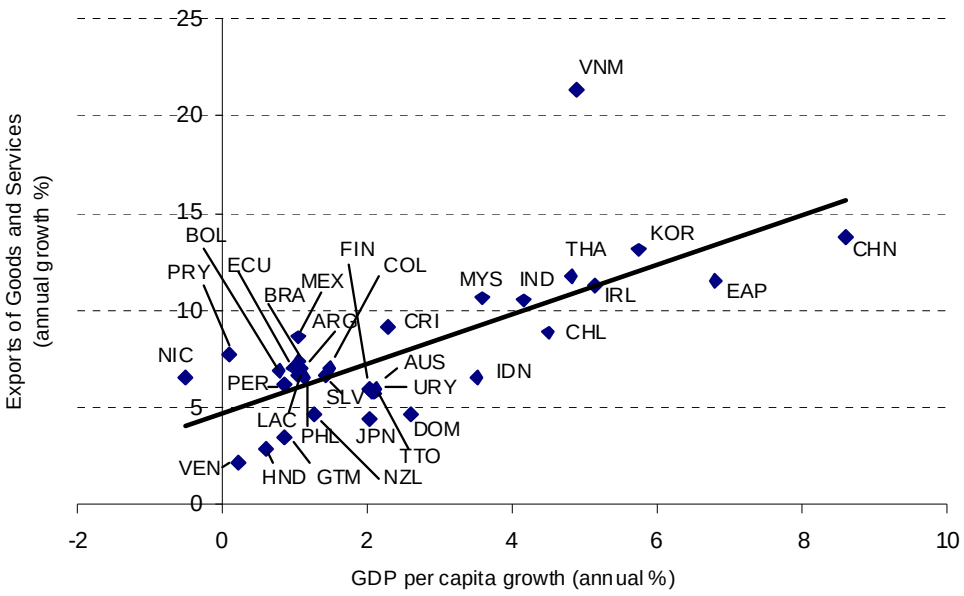
[1] The region's export growth in volume terms increased sharply over the past 50 years. Between 1991 and 2000, the volume of exports from the region grew at an annual rate of 9.2%, outstripping the world average. There has, however, been a clear downward trend in this series over the last few years, which is not unrelated to the growing difficulties faced by exporters in Mexico and several Central American countries in competing with Chinese products on the United States market (ECLAC 2008).

Figure 1, Latin American countries seem much less successful in translating exports in growth. Though Latin American countries' exports have significantly increased during 1985 and 2005–the physical volume of exports growing at un unprecedented rate, above the world average and exceeded only by China and India–, their growth performance has been less spectacular (ECLAC 2004, 2006). In fact, the region as a whole has registered one of the highest export growth rates, but Asian developing countries and several emerging European countries have been much more successful in this regard. The experiences of China and Republic of Korea stand out, and to a lesser extent, other Asian countries and Ireland.

One of the salient features of Latin American development process has been the dramatic and widespread trade liberalization of the region's economies. Openness coefficients increased considerably over the last three decades. Not only that all the region's economies are more open today than they were at the beginning of the 1980s, but also that the increase in openness has been substantial, with the regional trade openness coefficient tripling from 7.8% in 1980-1983 to 24.5% in 2005-2007 (ECLAC 2008). Higher openness coefficients have been observed especially for small and medium-sized economies, while Mexico quintupled its openness coefficient.

Despite a generally weak correlation between rates of increase in exports and GDP growth for the region's economies, current patterns of export specialization in the region include both cases of success and instances of mediocre performance (ECLAC 2006). Chile, highly dependent on a limited number of commodities, for instance, has been able to maintain high GDP and export growth, while Mexico has benefited little, in terms of economic growth, from its notable success in expanding and diversifying its exports. The general pattern seems to contradict the "curse of natural resources" postulate, and counter the strong evidence regarding the secular trend toward the worsening of terms of trade for commodities (ECLAC 2008).

FIGURE 1
EXPORTS (GOODS AND SERVICES) AND GDP PER CAPITA GROWTH, 1985-2005
(At constant 2000 prices)



Source: Author's calculations based on World Bank World Economic Indicators.

Notes: For Australia, Ireland, Japan, New Zealand, the growth rate of exports corresponds to the period 1985-2004. For Viet Nam, the growth rate of exports is for 1989-2005.

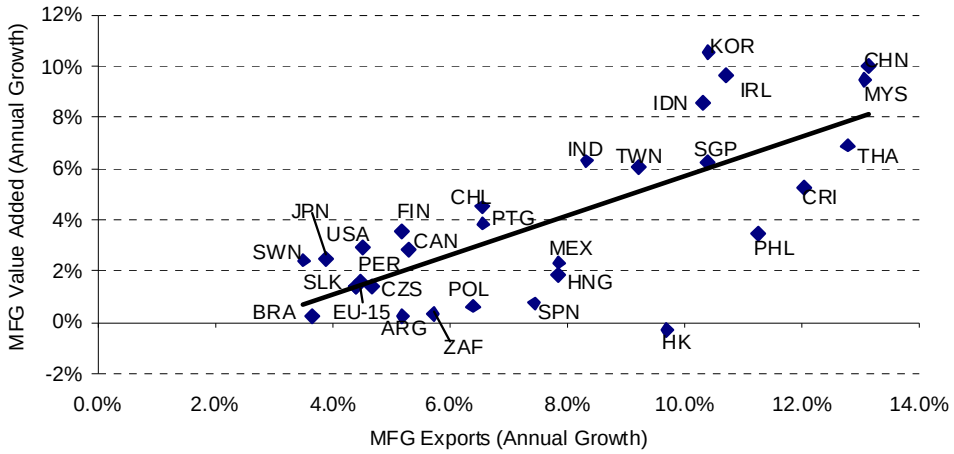
In this exercise, East Asia and the Pacific includes; American Samoa, Australia, Brunei Darussalam, Cambodia, China, Fiji, French Polynesia, Guam, Hong Kong, China, Indonesia, Japan, Kiribati, Korea, Dem. Rep., Korea, Rep., Lao PDR, Macao, China, Malaysia, Marshall Islands, Micronesia, Fed. Sts, Mongolia, Myanmar, New Caledonia, New Zealand, Northern Mariana Islands, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Thailand, Timor-Leste. Tonga.

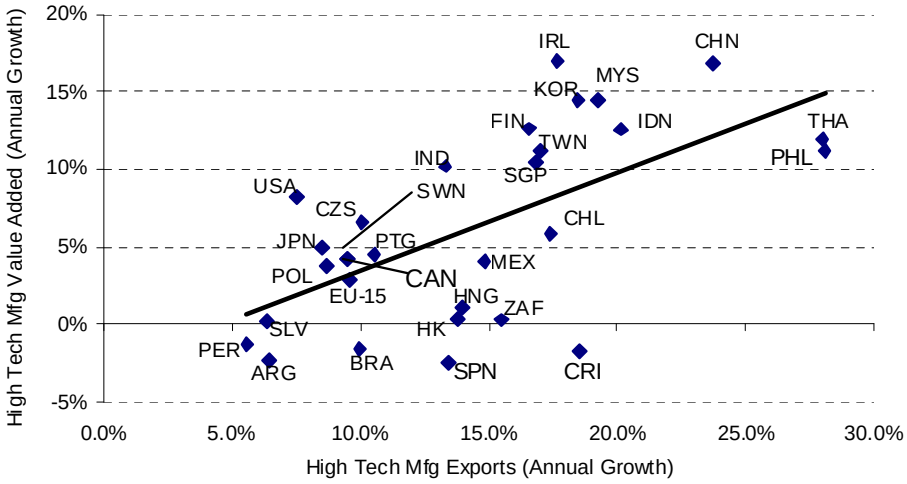
One of the reasons why Latin America and the Caribbean has not been able to harness trade as a source for changing production patterns and economic growth is its limited capacity to add value to exports. For example, despite an increase in manufacturing activity in the region, the growth in value-added generated by exports of manufactures has been disappointing in most cases (Figure 2). Irrespective of growing manufactured exports, the Latin American economies have not experienced the kind of dynamic restructuring of domestic production and export patterns that would allow investment to become an engine of growth. This experience may be attributed to the fact that there has been no significant shift in investment towards technology-intensive industrial categories in the majority of the region's economies. Instead, in almost all cases where a substantial change occurred in the intersectoral patterns of investment, there was a shift towards resource-based or labour-intensive products. The lack of investment dynamics in manufacturing may be the most visible difference in performance between Latin America and the Caribbean and the Asian success stories.

FIGURE 2

RELATIONSHIP BETWEEN MANUFACTURED EXPORTS AND MANUFACTURING VALUE ADDED IN SELECTED COUNTRIES, 1980-2003

(Constant 1997 prices)





Source: Calculated in base of data from US National Science Board, Science and Engineering Indicators 2006.

However, there are ample possibilities in other areas such as natural resources and low-tech manufacturing sectors than high-tech manufacturing to create investment-trade nexus and promote backward and forward linkages within the economy. In this regard, Hirsch-Kreinsten et. al. (2005) argue that: i) there exist no strong positive correlations between the high-tech share in manufacturing value added and the rate of GDP growth per inhabitant in OECD countries; ii) contrary to the conventional wisdom that the so-called high-tech, R&D intensive and science-based industries are the key drivers of future economic prosperity, most growth and employment in OECD countries still emanate from the so-called low and medium-low technology (LMT) industries; and iii) the firms in these industries are innovative and knowledge intensive without engaging in R&D to any great extent. The growth is based not on the creation of new sectors but on the internal transformation of sectors that already exist. Companies active in low-tech sectors are increasingly blending new technological capabilities with old ones, in fields such as ICT, biotechnology and smart materials; all this contributes to blurring the clear distinctions that existed earlier between the sectors belonging to distinct technology intensity (Mendonça 2004).

B. Quality of Latin American and the Caribbean exports

Industrialized and developing economies accounted for 58% and 35% of world merchandize exports in 2005, respectively —when Economies in Transition are included in the latter, the developing country's share rises to 41%—. In addition, still two-thirds of world manufactured exports came from the developed world (Table 1). Among developing regions, Latin America and the Caribbean exported 5.6% of world goods exports, and when Mexico excluded, only 3.4%. The region's share in manufactured exports reached 4.2% and when Mexico excluded, only 2.0%. In the same year, Developing Asia represented almost 22% of world goods exports, and when China excluded, almost 14% of world exports. Their share in manufactured exports was even greater, at 24.4%. Latin American goods exports were just about the same size of those by Middle East or North Africa. In short, Latin America maintains a low profile in international trade and its share over the years has not experienced substantial changes,[2] and furthermore, its share in world manufactured exports is almost insignificant when Mexico is excluded.

By products classified by technological intensity, world exports are dominated by manufactured exports (including natural resource-based manufactures, NRBMs) which accounted for almost 86% of world goods exports in 2005, the rest being accounted for by primary product exports. When primary products and NRBMs combined, the share reached 31% of world total exports. Medium and high technology products represented more than half of world goods exports that year. The contribution of low-technology exports was relatively low with a share of 15%. Despite its strong comparative advantage in primary products, Latin America and the Caribbean accounted for only 14% and 6% of world primary exports and NRBMs, respectively. Surprisingly, Developing Asia has a strong hold in these products and competes directly with Latin American suppliers.

Developing economies including Economies in Transition have become important exporters of medium and high-tech products accounting for 29% and 44% of world total exports, respectively. In this process, the Asian developing region has transformed into a dominant exporter of high-tech products, being responsible for 37%, and when China excluded, 25% of world total exports of these goods. Latin America's shares in world total exports of these two sub-sectors were meager, contributing a share of 4.3% and 3.2%, respectively, and a significant part of these exports originates from Mexico.[3]

[2] The share of Latin America and the Caribbean (excluding Mexico) in world exports of manufactures as defined by the WTO during the present decade increased from 5.0% (excluding Mexico, 2.0%) in 2000 to 7.3% in 2005 (2.2%). This contrasts with the share of South and East Asia excluding Japan, which rose from 7.6% in 1980 to 24.1% in 2005. The corresponding share for developed countries as a whole declined over the years, from 74.1% in 1980 to slightly less than 70% in 2005. Accordingly, the share of developing countries increased from 18.9% to 30% during the same period, with China contributing the most to this expansion (WTO 2006).

[3] Given its high presence in overall regional exports and particularly medium- and high-tech exports, the regional composition of exports changes drastically when Mexico is excluded. When the Aztecan country excluded, regional exports are divided roughly

A striking contrast to the Latin American case is Developing Asia. The share of primary products in total regional exports was below 6% in 2005, the rest being explained by manufactured exports with a share of over 94%. In the case of the latter, the exclusion of China does not change substantially the export basket of this region, since the export structures of other Asian developing countries are quite similar to that of China. However, China's presence in world exports of low, medium and high-tech products is overwhelming and has magnified even more since 2005.

C. Three basic patterns of trade specialization

Over the last twenty years, export specialization of Latin American and Caribbean countries has established three basic patterns. The first case is integration into vertical trade flows in manufactures centered mainly in the United States market, which characterizes the cases of Mexico, some countries of Central America and the Caribbean. The second relates mainly to South America where horizontal production and marketing networks, especially of natural resource-based commodities, are more common. This group is also characterized by highly diversified intra-regional trade and by more diversified market destinations. The third pattern, which is predominant in some countries of the Caribbean and Panama, corresponds to services exports, mainly for tourism, but also financial and transport services (Kuwayama and Durán 2003, ECLAC 2008).These trade specialization patterns have resulted in a profound change in the composition of regional exports in terms not only of values but also of their technological intensity (see Table 2). There has been an almost 5 percentage point reduction in the share of exports of primary products while NRBMs experienced a decline from 22.6% in during 1990-1995 to 17.2% of the region's total exports during 2000-2005.

Meanwhile, the share of other manufactures exports (low, intermediate and high-technology products) increased by almost a 10 percentage point, rising from 41.9% in the first period to 51.8% in the second period. These changes were most pronounced in Mexico and Costa Rica. The share of high-tech exports in the total exports of these two countries reached over 27% in the second period, similar share of high-tech exports reported by China and Thailand. Interestingly, the highest export share in high technology category is reported by the Philippines, whose export platform is based primarily on assembly type operations in the electronics industry.

Despite its relative decline, the first category of goods (primary products plus NRBMs) still accounted for a large portion of South American exports in recent years; in the cases of Mercosur (59.3%) and the four Andean Community countries –Bolivia, Colombia, Ecuador and Peru (77.6%). For Bolivarian Republic of Venezuela, Nicaragua and Panama, their share of primary products has accounted for almost, or more than, 90% of total exports and/or has even increased. By contrast, the combined share of primary products and NRBMs has declined sharply for Mexico and Costa Rica. Meanwhile, the combined share of these two categories for Central American countries has declined, whereas the share of low-tech exports, consisted primarily of apparel, has increased significantly over the 1995-2005 period.

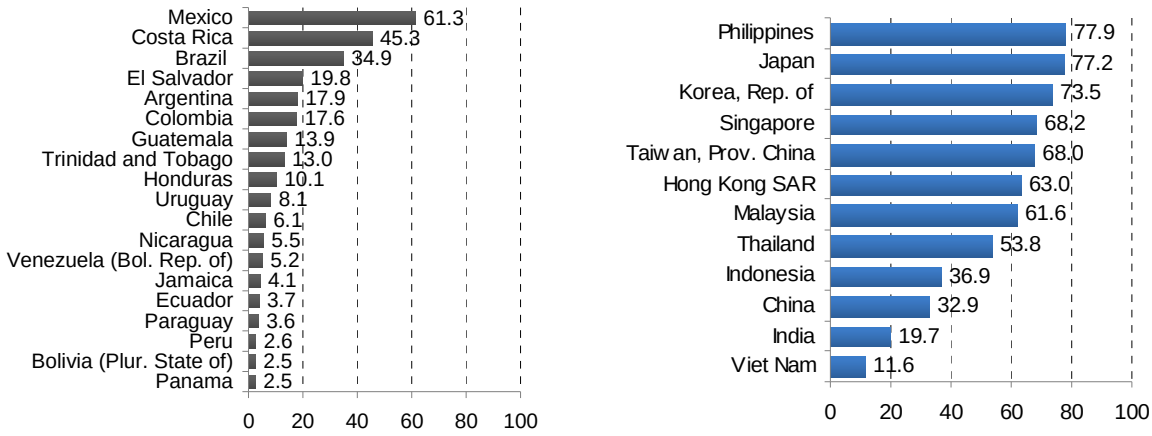
For Argentina, Colombia, Mexico, several Central American countries, (namely Costa Rica, El Salvador, Guatemala and Honduras), Dominican Republic, and the CARICOM member countries as a whole, the share of intermediate-technology goods has increased. This category includes consumer durables and, in particular, automotive products. Chile, country with one of the highest export growth rates in the region, still relies heavily on primary products and NRBMs (90.8%). In general, South American countries have been largely excluded from dynamic exports with high technology contents in world markets. Products that are common to global production sharing are not among the most dynamic exports from South America. Countries in this subregion have basically relied on their abundance of natural resources to expand their primary exports and their processed products.

between 48% of primary exports and 52% of manufactured exports. Almost 20% of region's exports consist of medium- and high-tech products, and when Mexico included, the combined share rises to 37%.

In contrast, during the 1990s Mexico has become the most dynamic and diversified exporter of non-NRBMs in the region. The dependence on the United States market which had been already high even before the signing of the North American Free Trade Agreement (NAFTA) deepened further, with that country absorbing almost 80% of Mexican exports. This dependence has been accompanied by significant changes in Mexican export mix, especially three sectors, which represent different technological levels: garments (low technology), the automotive industry (intermediate technology) and electronic equipment (high technology). In the automotive sector, Mexico already has an export platform that is fully incorporated into the internationally integrated production systems of the major motor vehicle manufacturers. Mexican electronics industry has become a part either of the internationally integrated production systems of firms based in the United States, Asia and Europe or of contract manufacturers.

These industrial achievements seemingly suggest that Mexico has been one of the major winners in the region in terms of international competitiveness. This country accounts for 2.2% of world manufactured exports. When measured in terms of technology intensity —the combined shares of Medium and High Technology exports in total goods exports—, Mexico ranks not as quite high as the Philippines, Japan, the Republic of Korea, Singapore or Chinese Province of Taiwan, but above China (Figure 3). As discussed, however, these developments, particularly with respect to the relationships between export growth, value-added and economic growth, should be assessed from insufficient linkages of these sectors with the rest of the economy. Contrary to the experiences of some Asian countries, Mexico's seemingly successful export sector has not been able to establish sufficient backward and forward linkages with the national economy. In this regard, the data on the share of developing economies in world manufacturing trade show that success in exporting manufactures is not a necessarily appropriate indicator of a country's industrial development and integration in the world economy.

FIGURE 3
SHARE OF MEDIUM/HIGH TECHNOLOGY EXPORTS IN TOTAL MERCHANDIZE EXPORTS, BY COUNTRY AND REGION, 2005
(In percentages)



Source: Author's calculations based on UNIDO database.

The experience of several Central American and Caribbean countries shows some similarities but also major differences with respect to Mexico. The changes observed in Costa Rica following the arrival of Intel Corporation to establish internationally integrated production system, in combination with the supplementary actions undertaken by the Government, have established a strong export base in its high-technology manufacturing sector —Costa Rica's exports of this category of products jumped from 3.4% of total exports during 1990-1995 to 30,7% in 2000-2005—. In other Central American countries (Guatemala and El Salvador) and in some Caribbean countries, the share of low technology

manufactures increased enormously, thanks mainly to the maquiladora-type operations or export-processing zones that are predominant in many parts of these sub-regions, which have not been able to establish links with the national production apparatus.

TABLE 1

TOTAL EXPORTS, PRIMARY EXPORTS AND MANUFACTURED EXPORTS, BY TECHNOLOGY INTENSITY AND REGION, 2005, SITC REVISION 3

(Current US dollars and percentages)

Regions	Primary Exports	Total manufactured exports	Resource-based	Low-technology	Middium-technology	High-technology	Total
Industrialized economies	492.9	**5 070.1**	1 006.5	721.3	2151.9	1 190.4	**5 563.1**
Economies in Transition	164.6	**481.7**	152.6	101.9	170.0	57.2	**646.4**
Developing economies	640.4	**2 697.4**	473.4	631.9	713.0	879.1	**3 337.8**
Sub-Sahara Africa	26.6	**64.3**	36.5	8.0	17.0	2.8	**90.9**
South Asia	17.8	**111.4**	35.5	53.1	17.2	5.7	**129.2**
Middle East and North Africa	292.2	**148.1**	52.1	44.5	43.7	7.7	**440.3**
Latin America and the Caribbean	191.6	**345.7**	93.3	54.5	130.3	67.5	**537.3**
excluding Mexico	155.3	**170.0**	77.3	26.5	52.4	13.8	**325.3**
East Asia and the Pacific	112.1	**2 027.9**	256.0	471.8	504.7	795.5	**2 140.0**
excluding China	87.7	**1 293.3**	184.4	230.0	336.8	542.2	**1 381.0**
Other	72.2	**55.3**	31.1	6.9	11.0	6.3	**127.5**
World	1 370.2	**8 304.6**	1663.6	1462.1	3045.8	2133.1	**9 674.8**

World trade shares by technology intensity and region 2005

Regions	Primary Exports	Total manufactured exports	Resource-based	Low-technology	Middium-technology	High-technology	Total
Industrialized economies	5.1	**52.4**	10.4	7.5	22.2	12.3	**57.5**
Economies in Transition	1.7	**5.0**	1.6	1.1	1.8	0.6	**6.7**
Developing economies	6.6	**27.9**	4.9	6.5	7.4	9.1	**34.5**
Sub-Sahara Africa	0.3	**0.7**	0.4	0.1	0.2	0.0	**0.9**
South Asia	0.2	**1.2**	0.4	0.5	0.2	0.1	**1.3**
Middle East and North Africa	3.0	**1.5**	0.5	0.5	0.5	0.1	**4.6**
Latin America and the Caribbean	2.0	**3.6**	1.0	0.6	1.3	0.7	**5.6**
excluding Mexico	1.6	**1.8**	0.8	0.3	0.5	0.1	**3.4**
East Asia and the Pacific	1.2	**21.0**	2.6	4.9	5.2	8.2	**22.1**
excluding China	0.9	**13.4**	1.9	2.4	3.5	5.6	**14.3**
Other	0.7	**0.6**	0.3	0.1	0.1	0.1	**1.3**
World	14.2	**85.8**	17.2	15.1	31.5	22.0	**100.0**

Distribution of each export intensity category, by region, 2005

Regions	Primary Exports	Total manufactured exports	Resource-based	Low-technology	Middium-technology	High-technology	Total
Industrialized economies	36.0	**61.1**	60.5	49.3	70.6	55.8	**57.5**
Economies in Transition	12.0	**5.8**	9.2	7.0	5.6	2.7	**6.7**
Developing economies	46.7	**32.5**	28.5	43.2	23.4	41.2	**34.5**
Sub-Sahara Africa	1.9	**0.8**	2.2	0.5	0.6	0.1	**0.9**
South Asia	1.3	**1.3**	2.1	3.6	0.6	0.3	**1.3**
Middle East and North Africa	21.3	**1.8**	3.1	3.0	1.4	0.4	**4.6**
Latin America and the Caribbean	14.0	**4.2**	5.6	3.7	4.3	3.2	**5.6**
excluding Mexico	11.3	**2.0**	4.6	1.8	1.7	0.6	**3.4**
East Asia and the Pacific	8.2	**24.4**	15.4	32.3	16.6	37.3	**22.1**
excluding China	6.4	**15.6**	11.1	15.7	11.1	25.4	**14.3**
Other	5.3	**0.7**	1.9	0.5	0.4	0.3	**1.3**
World	100.0	**100.0**	100.0	100.0	100.0	100.0	**100.0**

Distribution of each region's exports by technology intensity, 2005

Regions	Primary Exports	Total manufactured exports	Resource-based	Low-technology	Middium-technology	High-technology	Total
Industrialized economies	8.9	**91.1**	18.1	13.0	38.7	21.4	**100.0**
Economies in Transition	25.5	**74.5**	23.6	15.8	26.3	8.8	**100.0**
Developing economies	19.2	**80.8**	14.2	18.9	21.4	26.3	**100.0**
Sub-Sahara Africa	29.3	**70.7**	40.2	8.8	18.7	3.1	**100.0**
South Asia	13.8	**86.2**	27.4	41.1	13.3	4.4	**100.0**
Middle East and North Africa	66.4	**33.6**	11.8	10.1	9.9	1.7	**100.0**
Latin America and the Caribbean	35.7	**64.3**	17.4	10.1	24.3	12.6	**100.0**
excluding Mexico	47.7	**52.3**	23.8	8.1	16.1	4.2	**100.0**
East Asia and the Pacific	5.2	**94.8**	12.0	22.0	23.6	37.2	**100.0**
excluding China	6.3	**93.7**	13.3	16.7	24.4	39.3	**100.0**
Other	56.6	**43.4**	24.4	5.4	8.6	4.9	**100.0**
World	14.2	**85.8**	17.2	15.1	31.5	22.0	**100.0**

Source: Author's calculations based on information from COMTRADE database.

TABLE 2

LATIN AMERICA AND THE CARIBBEAN: EXPORT STRUCTURE, BY TECHNOLOGY INTENSITY, 1985-1995 AND 1995-2005, SITC REVISION 3

(In percentages of total exports)

	Primary products		Natural Resource-Based Manufactures		Low-tech Manufactures		Intermediate-tech Manufactures		High-tech Manufactures	
	1990-1995	2000-2005	1990-1995	2000-2005	1990-1995	2000-2005	1990-1995	2000-2005	1990-1995	2000-2005
United States	10.7	7.6	14.9	13.4	9.7	10.4	34.8	36.3	30.0	32.4
*European Union (15)	7.0	5.7	20.0	19.0	18.4	15.7	38.9	38.8	15.7	20.8
Japan	0.3	0.4	6.9	8.1	8.8	8.3	54.4	55.1	29.7	28.1
LAC (33)	35.5	31.0	22.6	17.2	11.9	11.4	22.6	25.5	7.4	14.9
Mercosur	31.7	35.4	25.9	23.9	15.4	10.8	23.5	22.7	3.4	7.2
Argentina	46.6	47.8	25.5	25.1	11.1	7.9	14.7	16.8	2.0	2.5
Brazil	26.4	29.7	26.5	23.6	16.4	11.5	26.7	25.8	4.0	9.4
Paraguay	72.6	71.6	16.4	17.1	9.3	8.6	1.3	1.9	0.4	0.9
Uruguay	38.6	43.7	14.8	21.6	32.2	24.4	13.1	8.6	1.3	1.7
Chile	36.7	37.3	54.9	53.5	3.4	2.5	4.5	6.1	0.5	0.6
Andean Community (4)	61.5	54.3	20.0	23.3	11.7	11.2	6.0	9.4	0.9	1.8
Bolivia (Plur. State of)	52.1	67.1	30.0	18.0	14.1	8.9	2.3	3.4	1.5	2.6
Colombia	56.4	48.2	16.0	18.6	16.5	13.7	9.9	16.6	1.2	2.8
Ecuador	86.0	76.3	9.5	16.3	2.0	3.1	2.0	3.6	0.4	0.8
Peru	44.8	45.3	40.6	37.5	11.7	13.6	2.5	3.0	0.5	0.6
Mexico	23.1	13.7	9.2	6.6	12.9	14.6	37.3	37.9	17.5	27.3
Venezuela (Bol. Rep. of)	58.2	78.3	32.6	13.0	3.4	2.5	5.5	5.7	0.3	0.5
MCCA	57.8	31.6	17.9	19.7	13.0	18.4	7.8	13.6	3.6	16.7
Costa Rica	59.3	23.4	16.8	13.8	12.8	15.7	7.7	16.3	3.4	30.7
El Salvador	44.1	16.6	16.5	29.9	23.0	33.8	11.7	13.2	4.7	6.5
Guatemala	49.3	37.5	23.3	22.1	12.9	22.9	9.6	12.7	4.9	4.8
Honduras	80.4	53.6	10.9	28.2	6.0	9.8	2.4	7.5	0.3	0.9
Nicaragua	70.4	67.7	14.2	22.5	9.8	3.9	3.0	4.9	2.6	0.9
Panama	66.4	70.1	15.4	19.3	13.5	7.2	1.9	1.3	2.8	2.1
CARICOM	41.9	39.2	36.3	39.7	12.6	5.7	7.0	14.0	2.3	1.4
Dominican Rep.	…	24.3	…	43.5	…	7.6	…	23.3	…	1.3
Rep. of Korea	1.9	0.8	8.7	12.2	29.3	14.3	34.3	37.4	25.8	35.4
China	11.1	4.2	11.2	9.5	49.5	35.2	17.1	21.2	11.0	30.0
Taiwan Prov. of China	3.2	1.2	6.9	7.5	35.3	22.1	26.0	25.3	28.6	43.8
Indonesia	42.9	34.9	24.3	22.6	21.6	19.8	8.4	12.7	2.9	9.9
India	20.6	14.1	25.4	31.2	39.0	34.7	10.8	14.1	4.3	5.9
Philippines	15.1	3.3	21.5	7.3	27.1	10.4	12.9	11.3	23.4	67.7
Singapore	3.1	1.2	20.4	17.7	8.1	6.4	22.0	18.8	46.4	55.9
Thailand	19.1	11.8	15.8	17.0	29.0	17.7	15.0	24.9	21.1	28.6
Viet Nam	…	46.0	…	6.9	…	36.1	…	5.7	…	5.3

Source: ECLAC calculations based on COMTRADE.

Overall, the quality of the region's export specialization, measured in terms of technology intensity, continues to be poor and no significant improvement has been observed over the last two decades except in the cases of Mexico and some countries of Central America and the Caribbean Basin, that is, the first of the regional specialization patterns described above. When measured by ECLAC's CAN classification, most of these goods belong to the category of "falling stars" or even "retreat products", whose demand is at a low echelon of international markets. Most of these products are subject to high price volatilities, some long-standing problems of market access (i.e., agricultural products) and others are subject to new restrictions (e.g., steel) in developed countries. Most of the manufactures are goods produced by technologically mature, machinery- and equipment-intensive industries.

II. Participation of Developing Economies in Medium and High-Tech Manufactured Exports and Manufacturing Value Added

Despite ambiguities and imperfections surrounding the definition and measurement, the so-called "high-tech" sector is occupying an increasingly larger share of the world trade. Roughly 20% of world manufacturing value added (MVA) are produced in these high-tech sectors, and as mentioned earlier, almost a quarter of world manufactured exports are of this variety, and more than a quarter of the exports of developing countries now belong to high-tech products, in comparison to a less than 10% level in 1988 (US Science Board 2006). At present, developed countries represent close to 60% of world high-tech manufactured exports while these countries account for almost 75% of high-tech MVA.[4] Developing countries' exports of these products originate from a small number of countries, namely China, Singapore, the Republic of Korea, Taiwan Province of China, Malaysia, the Philippines, and Thailand. To this group of countries, Mexico, Costa Rica, Ireland, Hungry, and Russia have been added in recent years.

This export specialization process by developing countries has been taking place within a limited number of products, accompanied by a rapid and sustained technological upgrading in the export composition of

[4] As far as the exports of high-tech products are concerned, the European Union (EU) is the leading exporter, but if intra-EU shipments are excluded, the United States (US) would rank above the EU. Estimates for 20003 show that exports by US high-tech industries account for about 16% of world high-tech industry exports, followed by Japan (9%) and Germany (8%).The US declining share has been mainly compensated for by newly industrializing economies, especially in Asia. In this respect, China stands out, with its share of global high-tech industry exports reaching 7% in 2003, up considerably from slightly more than 1% in 1990.

developing countries. This process involves essentially three product categories: electrical and electronic goods including parts and components (e.g., computers and office equipment; telecommunications, audio and video equipment and semiconductor), which seemingly require high R&D efforts. Between 1990 and 2003, developing countries recorded rapid and sustained exports increases in almost all of the segments of these dynamic sectors; in other product groups, these countries now account for one half or more of world exports, and in some categories, their share in world exports has increased several-fold from a relatively a small base (UNCTAD 2005).

Interestingly, the share of developing countries in the total exports of parts and components for electric and electronic goods is about 40%, while for telecommunications equipment and parts of electric circuit equipment it is about a quarter of the total value. A crucial factor responsible for the rapid expansion of trade in parts and components, especially in the electronic industry, as well as for the rising share of developing countries in those products, has been the spreading of internationally integration production systems.[5] In addition to the above-mentioned sectors, there are other emerging sectors that are of great interest to developing countries. They include biotechnology, life sciences, optoelectronics, advanced materials, and computer software.

A. Worldwide distribution of manufacturing value added

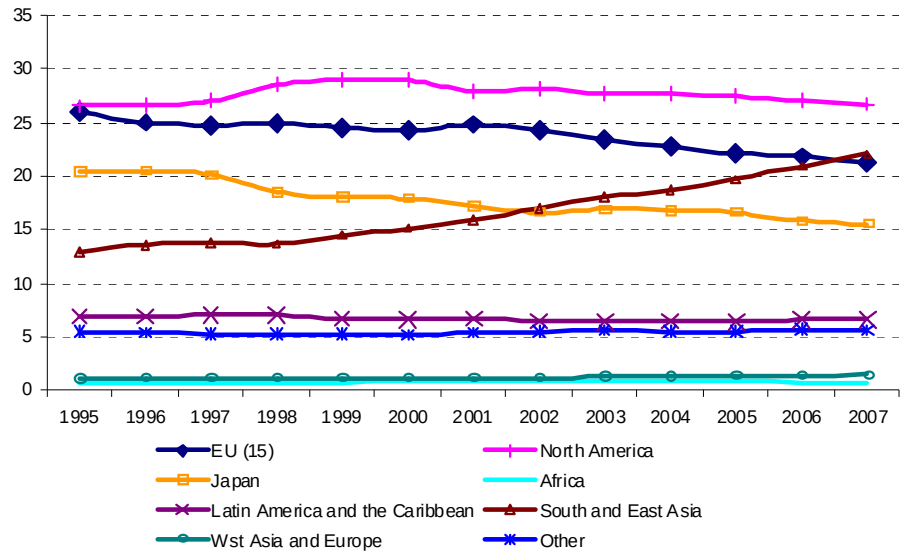
1. By regions

Over the last ten years, the shares of developing economies both in world manufactured exports and world manufacturing value added (MVA) showed a sharp increase, but growth in exports was much stronger than in MVA. This contrasts with the experience of developed countries, whose share in world manufacturing exports and MVA sharply fell during the same period. The fall of the European Union (15) share and that of Japan was more marked than that of North America (Figure 4-A).

FIGURE 4

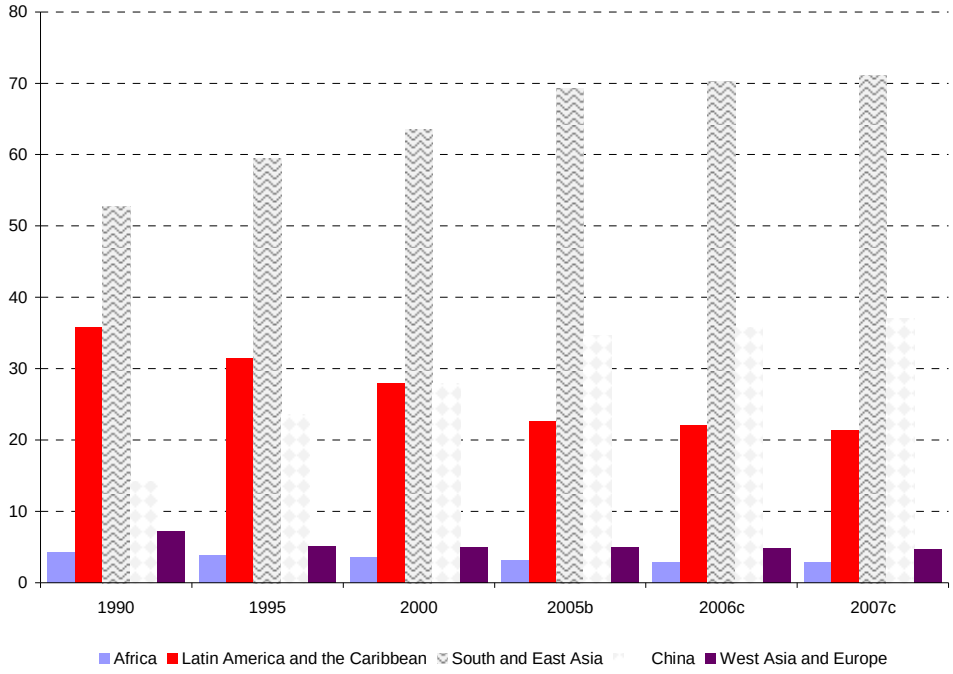
SHARE IN WORLD AND DEVELOPING REGIONS MVA 1990-2007 [a]/

A. World



[5] An estimate by Hummels, Ishii and Yi (2001), on the basis of input-output tables from ten OECD and four emerging-market countries, suggests that trade based on specialization with vertical production networks accounted for one-third of world trade growth between 1970 and 1990.

B. Developing Regions



Source: UNIDO, World Industrial Statistics Yearbook, 2008.

[a] calculations are based on constant 2000 constant dollars

[b] Provisional

[c] Estimate.

The fall observed for developed countries has been mainly compensated for by the rising share of East and Southeast Asian developing countries, especially by the fast increasing China's MVA representing close to 44% of the Asian total share and roughly 37% of total developing regions' MVA. The corresponding shares of other developing regions have been relatively stable; the Latin American and Caribbean region has maintained a share between 6.9 and 6.6% during 1995 and 2007 (Figure 4-B), but below the 7% level recorded in 1980 or 1997 and 1998. This region has been the slowest region over the last 25 years, just behind Sub-Saharan Africa (Lall et al. 2005).

Compared with South and East Asia and the Oceania, Latin America and the Caribbean shows a quite disappointing performance in MVA. Its MVA growth rate has been not only modest but also stagnant over the last fifteen years. By contrast, the corresponding figures for the developing Asian countries are very impressive: its already high MVA growth at the beginning of the 1990s growth rate has kept increasing overtime (see Annex Table 1). The MVA growth rate for Asia, which includes not only the well-known Asian Tigers (Republic of Korea, the old members of ASEAN —Indonesia, Malaysia, the Philippines, Thailand and Singapore— and its relatively new members —e.g., Vietnam, Laos Cambodia—, but also China and India, more than quadruples that of Latin America and the Caribbean. The Asian experience, except the case of Hong Kong (SAR) whose productive structure has shifted toward services, shows high and sustained MVA growth rates. As a result, the Asian MVA per capita has been rapidly converging to the Latin American level.

The growing MVA as percentage of GDP in South and East Asia suggests that this region as a whole is still industrializing, while Latin America and the Caribbean as a region is not doing so as fast as the Asian counterpart. As observed in Annex Figure 1, the total South and East Asia's MVA, calculated at 2000 constant US dollars, began to overtake that of Latin America and the Caribbean at the beginning of 1990s, and since then the gap in MVA between the two regions continues to widen. As a result, Asian MVA per capita approaches rapidly the level of Latin America, which has stagnated over the years.

2. By sector and region

The recent global MVA dynamic has been characterized by the increasing importance of several machinery and equipment sectors, namely Office, accounting and computing machinery (ISIC Rev,3, 30), and Radio, television and communication equipment (32). The most spectacular has been the growth of Category 32 whose MVA grew at a rate close to 30% annually during 1995-2000. In general, those natural resource–related sectors where Latin America and the Caribbean countries have strong traditional comparative advantages, the MVA growth has been meager, but the growth for the 2000/2006 period has been more favorable than that corresponding to the period 1995-2000 (See Table 3). The growth rates in these sectors for developed market economies have been in many cases negative, in a strong contrast to economies in transition or developing countries whose MVA continues expanding. The manufacturing sector as a whole has been experiencing a significant slowdown in the first five years of the present decade, when compared to an exceptionally high growth rates of MVA registered during the second half of the 1990s, regardless of the regions considered.

TABLE 3

AVERAGE ANNUAL REAL GROWTH RATE OF MVA, BY DEVELOPED AND DEVELOPING REGIONS, 1995-2000 AND 2000-2006

(At constant 2000 prices)

CODE	DESCRIPTION	Industrialized countries		CIS countries		Developing countries		World	
		1995-2000	2000-2006	1995-2000	2000 2006	1995 2000	2000-2006	1995-2000	2000-2006
32	Radio,television and communication equipment	28.3	11.6	1.0	8.4	15.9	15.4	26.0	12.2
35	Other transport equipment	3.9	1.9	2.4	7.8	9.1	16.0	5.4	7.7
31	Electrical machinery and apparatus	4.5	1.6	-0.2	10.2	9.0	15.1	5.6	6.2
16	Tobacco products	-1.7	-1.5	18.8	4.2	4.6	8.5	2.1	5.3
27	Basic metals	0.7	1.1	3.0	4.8	4.4	10.4	1.8	4.6
33	Medical, precision and optical instruments	3.9	3.5	13.4	17.2	3.6	7.1	4.0	4.2
30	Office, accounting and computing machinery	18.9	4.1	-1.3	23.0	7.2	3.5	17.3	4.1
24	Chemicals and chemical products	3.0	2.5	4.9	4.3	5.8	6.9	3.7	3.7
34	Motor vehicles, trailers, semi-trailers	4.5	2.6	4.0	5.1	2.9	8.6	4.3	3.6
29	Machinery and equipment n.e.c.	0.9	2.1	-2.5	8.2	2.1	8.9	1.1	3.5
25	Rubber and plastics products	3.2	1.0	5.7	7.5	4.6	8.2	3.6	3.3
23	Coke,refined petroleum products,nuclear fuel	0.7	0.9	-0.5	5.0	2.9	5.7	1.7	3.3
15	Food and beverages	1.1	1.0	1.1	8.0	1.6	6.0	1.2	2.8
26	Non-metallic mineral products	0.7	0.2	-1.8	7.6	0.8	4.8	0.7	1.9
21	Paper and paper products	1.1	0.3	6.5	6.4	4.4	7.2	1.7	1.9
20	Wood products (excl. furniture)	1.6	1.0	-0.3	7.5	0.0	5.2	1.3	1.9
28	Fabricated metal products	1.8	0.3	-1.8	12.0	2.8	5.5	2.0	1.4
17	Textiles	-1.1	-3.9	0.3	3.3	1.8	4.7	0.3	1.0
36	Furniture; manufacturing n.e.c.	1.9	-0.7	-0.6	8.2	-1.2	6.2	1.3	0.9
19	Leather, leather products and footwear	-3.5	-7.0	-4.9	6.4	0.7	6.6	-1.6	0.9
22	Printing and publishing	2.1	-0.7	4.5	10.5	1.7	5.7	2.1	0.1
18	Wearing apparel, fur	-5.3	-8.2	3.6	0.0	2.4	5.9	-2.8	-1.6

Source: UNIDO Industrial Statistical Yearbook 2008.

Notes: CIS countries include Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Ukraine and Uzbekistan.

As a result of differentiated growth dynamics among sectors, Radio, television and communication equipment (32) has become the single largest contributor to the world MVA accounting for over 20% of world total, followed by Food and beverages (15), and Chemicals (24) whose individual share reaches over 9% of world MVA (Figure 5). Other important sectors include Machinery and equipment (29), Motor vehicles (34), and Basic metals (27) each accounting for more than 5% of world MVA. The rest are quite evenly distributed.

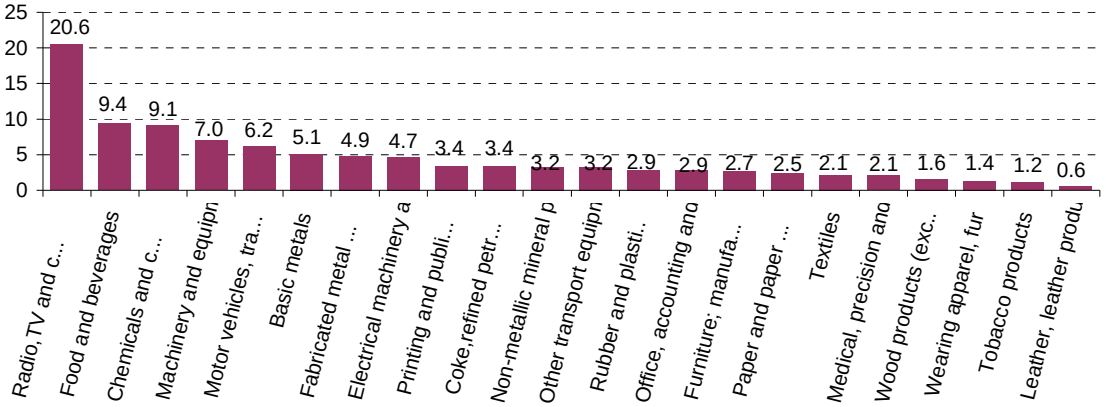
There are significant sectoral differences in the distribution of MVA between developed market economies and developing countries (Table 4). For the developed economies, only three branches ((i.e., Radio, television and communication equipment (ISIC rev.3, 32), Office, accounting and computing machinery (30) and Medical, precision and optical instrument (33)) have increased their shares among the 21 branches considered. The remaining 18 branches experienced a relative decline in their shares in the total MVA during 1995 and 2005. Developing countries, in contrast, yet heavily rely on traditional

manufacturing branches for value creation. Still close to 12% of total MVA of these countries is being generated in the branch of Food and beverages, more than 10% of total MVA comes from Chemicals and chemical products, and roughly 7% is being produced in Basic metals. Only 11% of total MVA arises from the most dynamic sector of Radio, television and communication equipment, branch in which developed market economies generate more than 25% of their total MVA. In sum, in developing countries, while high-tech sectors begin to promote value-added creation, the majority of MVA is still being generated in traditional industrial activities of high natural resource orientation and their processing. This pattern fits particularly well Latin America and the Caribbean.

FIGURE 5

WORLD STRUCTURE OF MVA BY INDUSTRIAL SECTORS, 2000-2006

(Percentage shares of individual branches in total MVA at constant 2000 prices)



Source: UNIDO Industrial Statistical Yearbook 2008.

Given the asymmetry in industrial specialization between developed economies and developing countries, as can be observed in the Figure 6, a large portion of MVA in the high-tech braches is accounted for developed market economies, in some cases reaching over 90%. The braches to which developing countries contribute most to the world MVA are: tobacco products (16), with a 67% of world MVA; leather, leather products and footwear, with a 58%; textiles with a 53%, and wearing apparel and fur, with a share of 47%.

These figures point to the fact that as far as MVA generation is concerned, developed countries still account for a large proportion of world MVA in the traditional industrial branches while their contribution to the world MVA in high-tech branches is still high. High value added and knowledge-intensive industrial activities are still maintained in industrial countries, without being relocated or diffused to developing regions. As shown later, increasing high-tech exports by developing countries have not been accompanied by concomitant increases in MVA for developing countries.

TABLE 4

STRUCTURE OF MVA IN SELECTED COUNTRY GROUPS, 1995-2000 AND 2000-2006

(Percentage shares of individual branches in total MVA at constant 2000 prices)

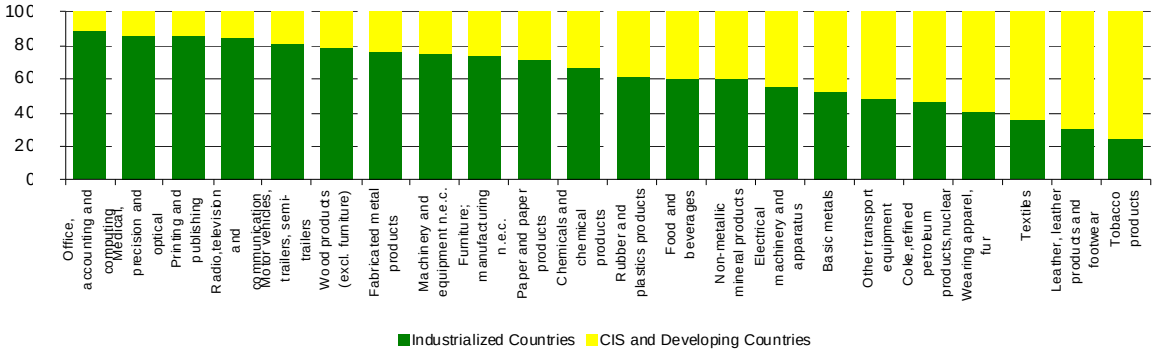
	Indusrialized countries		CIS countries		Developing countries		World	
DESCRIPTION	**1995-2000**	**2000-2006**	**1995-2000**	**2000-2006**	**1995-2000**	**2000-2006**	**1995-2000**	**2000-2006**
Radio,television and communication equipment	5.6	25.0	1.5	1.6	4.6	11.0	5.3	20.6
Food and beverages	11.0	8.2	17.5	18.2	15.6	11.9	12.2	9.4
Chemicals and chemical products	10.0	8.9	8.3	8.1	9.8	9.7	10.0	9.1
Machinery and equipment n.e.c.	9.4	7.5	10.8	8.7	5.9	5.6	8.6	7.0
Motor vehicles, trailers, semi-trailers	7.6	7.2	4.0	4.1	4.1	3.9	6.7	6.2
Basic metals	5.2	3.9	16.0	15.8	6.7	7.5	5.7	5.1
Fabricated metal products	7.2	5.4	4.3	5.0	4.4	3.6	6.5	4.9
Electrical machinery and apparatus	4.1	3.8	2.8	3.3	3.9	6.9	4.1	4.7
Printing and publishing	6.0	4.2	1.0	1.6	2.2	1.7	5.1	3.4
Coke,refined petroleum products,nuclear fuel	3.1	2.3	5.4	4.6	7.5	5.9	4.2	3.4
Non-metallic mineral products	4.0	2.8	7.8	6.7	5.7	4.1	4.5	3.2
Other transport equipment	2.5	2.3	4.2	3.8	3.0	5.5	2.6	3.2
Rubber and plastics products	3.2	2.6	1.7	2.2	3.6	3.7	3.3	2.9
Office, accounting and computing machinery	1.8	3.7	0.2	0.3	1.2	1.0	1.7	2.9
Furniture; manufacturing n.e.c.	4.1	2.9	2.6	2.5	3.1	2.3	3.9	2.7
Paper and paper products	3.7	2.6	2.7	3.1	2.4	2.2	3.4	2.5
Textiles	2.3	1.1	3.0	2.3	6.2	4.6	3.2	2.1
Medical, precision and optical instruments	2.5	2.6	1.5	3.7	0.9	0.8	2.1	2.1
Wood products (excl. furniture)	2.5	1.9	1.8	1.6	1.6	1.1	2.3	1.6
Wearing apparel, fur	2.6	0.8	1.8	1.4	3.2	2.6	2.7	1.4
Tobacco products	0.7	0.4	0.5	0.8	2.9	3.0	1.2	1.2
Leather, leather products and footwear	0.7	0.3	0.8	0.6	1.7	1.3	0.9	0.6
All sectors	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: UNIDO Industrial Statistical Yearbook 2008.

FIGURE 6

DISTRIBUTION OF WORLD MVA, INDUSTRIALIZED COUNTRIES VS. DEVELOPING COUNTRIES, BY INDUSTRIAL SECTORS, 2006

(In percentages)

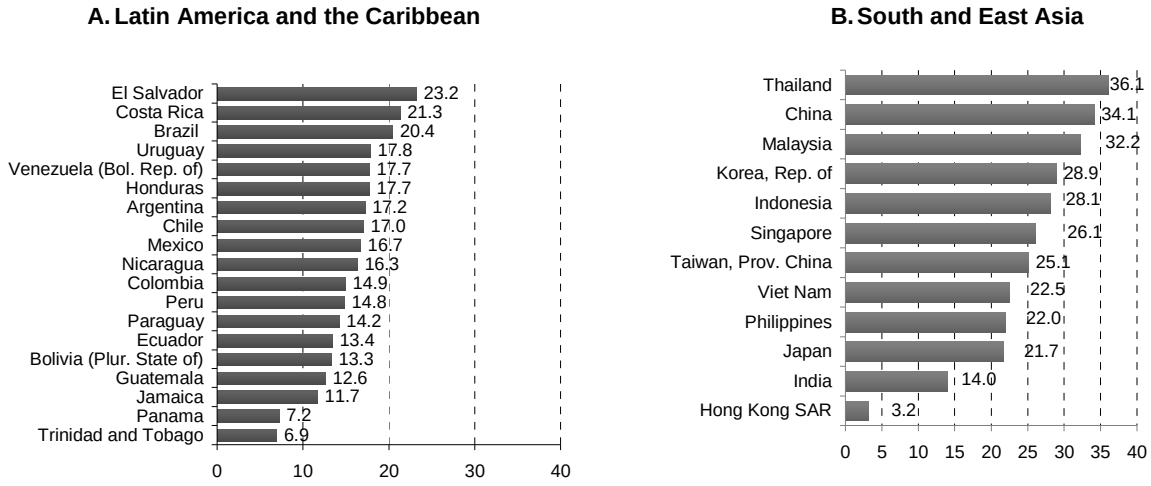


Source: UNIDO, Industrial Database.

The MVA evolution of selected Latin American countries has been disappointing, especially so when the growth of MVA over the last decade and half and the behavior of MVA in high-tech industries

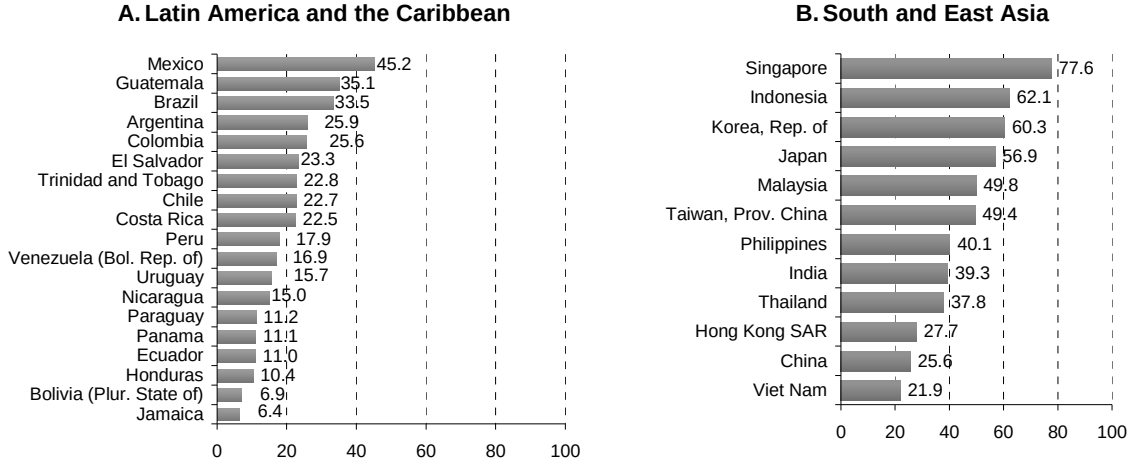
are taken into account (Figure 7 and Table Annex 1).[6] The region's MVA growth rate for the period of 2000-2006 declined to 2.8% from 3% registered for 1995-2000, rates far below corresponding to those for developing countries as a whole of 5.3% and 7%, respectively. Not surprisingly, South and East Asia and Oceania reported much higher rates for both periods (6.6% and 8.8%, respectively).

FIGURE 7
SHARE OF MVA IN GDP, BY SELECTED ECONOMIES, 2005 AT CONSTANT 2000 US DOLLARS
(In percentages)



Source: UNIDO, Industrial Database.

FIGURE 8
SHARE OF MEDIUM AND HIGH-TECHNOLOGY PRODUCTION IN MVA, BY SELECTED ECONOMIES, 2005 AT CONSTANT 2000 US DOLLARS
(In percentages)



Source: UNIDO, Industrial Database.

[6] In this exercise, the classification of high-tech industries follows the definition of OECD, which includes the following industrial sectors; Aircraft and spacecraft (ISIC rev.3 353), Pharmaceuticals (2423), Office, accounting and computing equipment (30), Radio, television and communication equipment (32) and Medical, precision and optical instruments (33). For more details, see OECD, ANBERD database, http://oecd.org/dst/sti/stat-ana/stat/esa_anb.htm and STAN database, http://www.oecd.org/document/15/0.2340.en-2649_201185_1895503_1_1_1_1,000.html (May 2001).

The share of MVA in the regional GDP tells the same story. The combined MVA of Latin America and the Caribbean countries, calculated at constant 2000 prices, accounted for over 18 % of the regional GDP during 1995 and 2006, while that for Asian counterparts increased from 23% to 27%. Among the countries in Latin America and the Caribbean, only three countries, El Salvador, Costa Rica and Brazil, reported a share higher than 20% in 2005. All the countries in Asia, except Hong Kong SAR and India, —the former being a highly services oriented economy and the latter still at an incipient stage of industrialization—, show a much higher shares ranging between 20% and 36%. As a result, the MVA per capita of Asia almost doubled during this period from US$ 201 in 1995(at constant 2000 US dollars) to US$ 399 in 2006, while the increase for Latin America and the Caribbean was much smaller, from US$ 680 to US$ 793 during the same period (See Annex Table 1).

Of the limited size of overall Latin American MVA, still a smaller share has been destined to medium and high technology activities. With the exception of Mexico which spent roughly 45% of its MVA in these two categories of production in 2005, individual countries contributed a relatively small share to high value-added activities. In a strong contrast, Asian countries spent a twice as much higher proportion of MVA to the high value-added activities.

III. Links between Manufactured Exports and MVA

Developing countries with a large population and certain level of domestic purchasing power, such as Argentina, Brazil and Mexico in the region, may be able to generate domestically a substantial part of the demand needed to support industrialization. But smaller developing countries will need to generate exports as a vent for output, because a small economy is hardly able to maintain the circular, virtuous causal links between productivity growth, economies of scale and investment, simply by meeting internal demand. From this perspective, it is the interaction of supply and demand factors in the investment process that translates productivity growth into further investment, maintains productive dynamism and technological change, and deepens trade specialization.

The usual justification for concentrating in the manufacturing sector has been the belief that industrialization, particularly the development of manufacturing activities, offers the greatest scope for productivity growth because manufacturing provides a large potential for the division of labor as well as virtually unlimited scope for technological change. Moreover, most manufactured products offer higher income and price elasticity of demand than other products. Complementarities in investment, production and consumption are also generally considered to be greater in manufacturing than in other sectors thanks to greater and stronger forward and backward linkages that the manufacturing sector is capable of generating (UNCTAD 2006). As argued later, these assumptions in favor of industrialization based in manufacturing activities might also perfectly apply to other sectors of the economy such as natural-resource-based or services-related ones.

The link between manufacturing exports and manufacturing value added (MVA) can be considered in the following manner. If the developing country is not equipped with a critical mass of linkages that provide "pecuniary externalities" to individual firms, because of the lack of domestic intermediate inputs or insufficient domestic demand from either other industrial firms or final consumers, it will import a large fraction of production inputs and export the bulk of output without much domestic value added. As a result, the country's manufactured exports will strongly rise, while MVA will go up marginally. By contrast, a developing country with established domestic linkages will provide a large share of intermediate inputs from domestic production and a large share of output will go into further domestic production or consumption. As a result, at the initial stage, the country's manufacturing exports will rise much less, while its MVA will rise much more than in the first case (Mayer 2004). But at subsequent stages, solid domestic production bases start to serve as another growth engine by taking advantage even further of economies of scale in production and exportation, with concomitant increases in manufacturing exports.

From the viewpoint of the links between manufactured exports and MVA, the overall picture for Developing Asia is totally different from that of Latin America and the Caribbean. Furthermore, the Asia's relatively favorable position in MVA relative to Latin America and the Caribbean has also been replicated in other sectors of the economies. The growth rate of value added in non-manufacturing sectors of Developing Asia has been superior to that of the developing country average and that of Latin America and the Caribbean (Annex Table 1, Annex Figures 1-C, 1-D, 1-E and 1-F); the size of agriculture value added in Asia is much greater and its growth has been substantially higher than that of Latin America and the Caribbean. Given the three times larger population of Asia, the agriculture value added in Asia is still lower than the Latin American counterpart but it is caching-up quickly.

A similar pattern of catching-up is in progress in the services sector, though in this case, Latin America and the Caribbean shows a greater total value added and is far above the Asian per capita average. When viewed from the supply side of the economy, the motor of growth for Latin America and the Caribbean has been the non-manufacturing sectors, which have grown, however, at a rate much lower than those two sectors in South and East Asia.[7] Latin America and the Caribbean has become more services-oriented economies. In Asia, the distinct productive sectors have played complementary roles among each other, rather than substitutive ones, unlike the case of Latin America and the Caribbean.

A salient characteristic of the region's productive structure is precisely its static, non-transforming nature. The performance of value-added by the major sectors (see Annex Table 2) indicates that higher value added growth rates in manufacturing —over a 4% annual growth over the 1990-2005 period— have been recorded by smaller countries such as Dominican Republic, Trinidad and Tobago, Chile, Costa Rica, El Salvador and Honduras, while large economies such as Brazil, Argentina, and Mexico are much less impressive in this regard.

A. Some national cases

The recent studies (UNCTAD 2002, 2006; US National Science Board 2006, 2008) draw special attention to possible relations between export dynamism, value-added in exports and technology complexity. Comparing the evolution of manufacturing trade and MVA between the G-7 countries and several most advanced developing countries for which data are available, the studies conclude that: i) manufacturing value-added (MVA) tends to consistently exceed manufacturing trade in developed countries, but the opposite is true for developing countries; ii) in both groups of countries, MVA has

[7] A more detailed analysis of the Latin American value-added structure by principal sectors of the countries during 1990 and 2005 shows that the share of the manufacturing sector of the region as a whole in the overall regional GDP declined from 19.2% in 1990 to 17.7% in 2005, while that of agriculture, hunting forestry and fishing ranged between 6.0% and 6.6%, and mining and quarrying increased from 3.1% to 3.7% over the same period (see Annex Table 2). These three sectors accounted for roughly 27% of the total regional GDP over the years, the rest being represented by various services sub-sectors (construction, electricity, gas and water; transport, storage and communications; wholesale and retail trade, restaurants and hotels; finance, insurance, real estate and business services; and community, social and personal services) whose shares have not experienced major changes over the years.

tended to fall relative to manufacturing trade, but the decline was much more pronounced in developing countries; iii) in developing countries, manufacturing exports and imports were broadly at the same levels until the end of the 1980s, when imports started to grow much faster than exports, while in industrialized countries manufactured exports constantly exceeded imports; and iv) while the ratios of MVA and exports to GDP remained largely unchanged in the developed countries, in the developing countries, with the exception of several emerging Asian and European countries, the ratios of manufactured exports to GDP has risen steeply, but there has been no significant upward trend in the ratio of MVA to GDP.

In short, the fact that developing countries perform much better than developed ones in manufacturing trade but not so well in MVA reflects the globalization process in progress, in response to liberalization and technological change as well as to the deepening of supply-value chains beyond national boundaries; a major explanation for success in manufactured exports lies in the rise of integrated production systems rather than in their capabilities in production of sophisticated goods (Lall, et. al. 2005).

The linkage between MVA and manufacturing trade in selected Asia substantially differs from that of Latin American experience (See Figures 9 series). First of all, almost invariably, the countries in Asia show a trade surplus position over the years. Secondly, in these Asian countries, there has been a concomitant increase between these two variables. Thirdly, in the majority of cases, the overall MVA expansion has been accompanied by incremental increases, though less significant, in the high-tech MVA. As mentioned earlier, China succeeded in more than tripling its share in both world MVA and world manufactured exports between 1990 and 2005. Its experience closely resembles that of the Republic of Korea between 1980 and 2000. Together with the Taiwan Province of China, China and Korea are often portrayed as the most successful economic catch-up showcase among the late-comer industrializing countries.

However, the Asian experiences also show a marked heterogeneity. In China and India, countries with a large domestic market, the MVA is always higher than manufacturing exports or imports, a characteristic of a large-sized successfully industrializing developing economy. The evolution of MVA and manufacturing trade in the second-tier industrializing in Asia (e.g., Malaysia, Philippines, Indonesia and Thailand) has been less impressive; all the first-tier industrializing economies and China excluding Hong Kong (China), MVA rose as fast as, or faster than, both manufactured imports and exports over the past two decades. Though the causality between the two variables is difficult to discern, there are clear complementarities between them.

This outcome in Asia strongly contrasts with that of Latin America. For the six countries considered, manufacturing trade performance has been erratic and for a prolonged period it has experienced deficit. Mexico, whose share in world manufactured exports increased more than fivefold during the 1990s, while its share in world MVA only about doubled during the same period. Moreover, both these shares declined during the early 2000s. The case of Costa Rica is similar to that of Mexico, with almost invariable trade deficit in manufacturing trade and a stagnant MVA growth pattern. Brazil and Argentina show an interesting development; these two countries share a similar pattern of China and India where the MVA is far greater than the manufacturing trade level, but their MVA increases have been quite stagnant. The Chilean pattern resembles the successful Asian counterparts.

The cases of developed countries also show strong heterogeneity; the experiences between the United Sates, European Union (15) and Japan indicate different patterns. Both the overall MVA evolution and the MVA in high-tech sectors in Japan have been disappointing, while manufacturing trade has been always in a surplus position. Though its manufacturing trade always in deficit, the United States shows a more favorable MVA evolution, in which both the overall MVA and the high-tech MVA continue to expand. In contrast, the European case has been more “export-led” in the sense that against the consistently growing trade in manufactures, the two MVA indicators are stagnant relative to the US experience. The two other cases (i.e., Ireland and Finland) follow the pattern of successful Asian countries in which all the variables continue to expand in a concomitant manner.

Developing countries in an early stage of industrialization that attract relocating industrial activity mainly on the basis factor price differences, such as probably exemplified best by Malaysia, the Philippines, Costa Rica and Mexico, experience a change in their structure of manufactured exports accompanied by little change in their MVA. In other parts of Latin America, manufacturing production has been sluggish: not only it has grown slowly but also its structure has not generally suffered major transformations. Resource based sectors have done better than others, but not because they have grown particularly rapidly. Rather, their growth is well below that of other regions. The more technology-intensive sectors have done poorly relative to other developing regions.

In his analysis on the relation between the average rates of export expansion and of real value added for each branch of manufacturing in Mexico during 1988 and 2005, Moreno-Brid (2007) observes that there is no significant relation between the two, independently of whether or not maquiladoras are included, and concludes that "[…] in general exports have not been able to act as a strong engine of growth of the manufacturing sector. In fact, neither they have had sufficiently strong spill over effects in other branches of the economy. This incapability is partly due to the fact that Mexico's manufactured exports have become heavily dependent on imports, with rather reduced local content and weak linkages with domestic suppliers. This is true of maquiladoras but also of a substantial proportion of other firms that export manufactures."(p.10). In sum, Mexico's manufacturing sector has not yet successfully entered the international markets based on high value-added processes and products, though the country is one of the most successful exporters of such products worldwide.

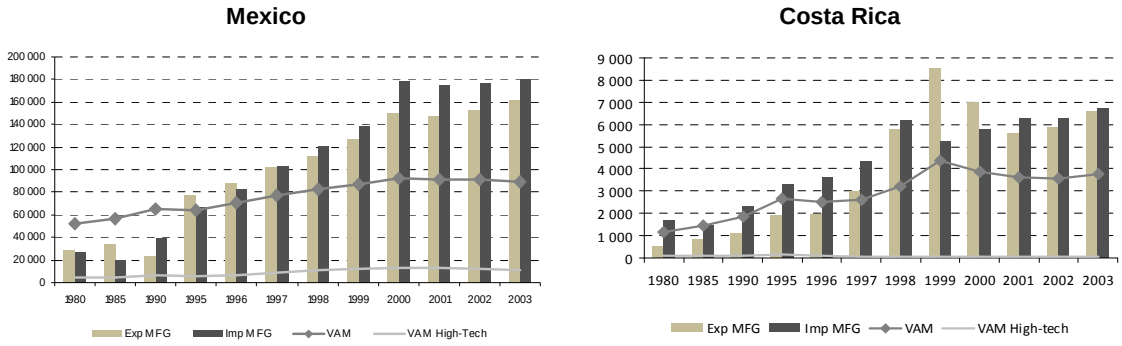
By contrast, developing countries whose well-established industrial base allow them to enjoy linkage-related effects, such as exemplified by the Republic of Korea and Taiwan Province of China, experience a change in the structure of MVA with a concomitant change in the value and the structure of manufactured exports. The cases of these two Asian countries suggest that it is necessary to create critical masses of linkages that provide a growth strategy that mobilizes the capabilities of domestic institutions and investors. The accumulation of capital, both human and physical, and the provision of appropriate infrastructure with a view to raise productivity continue to be key factor in this regard. Also important are trade policy measures by developed countries designed to reduce access barriers to imports of high value goods from developing countries.

FIGURE 9

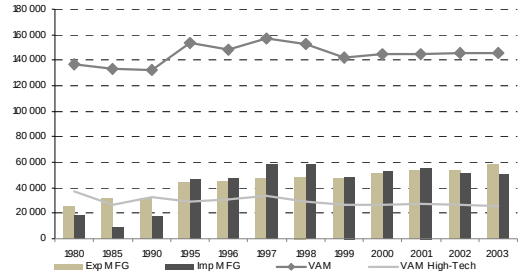
EVOLUTION OF MANUFACTURING TRADE AND MANUFACTURING VALUE ADDED: 1980-2003

(In million constant 1997 dollars)

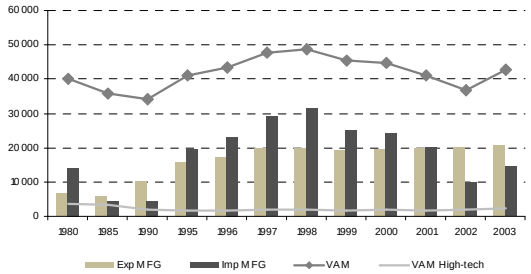
A. Selected Latin American countries



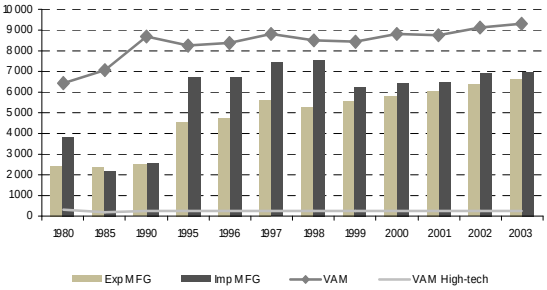
Brazil



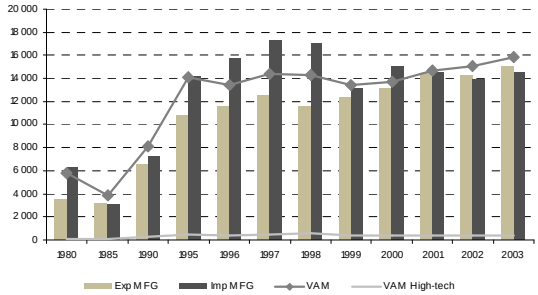
Argentina



Peru

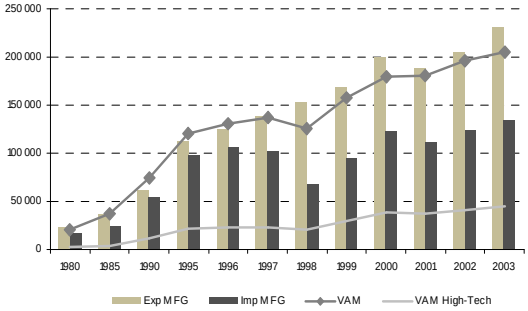


Chile

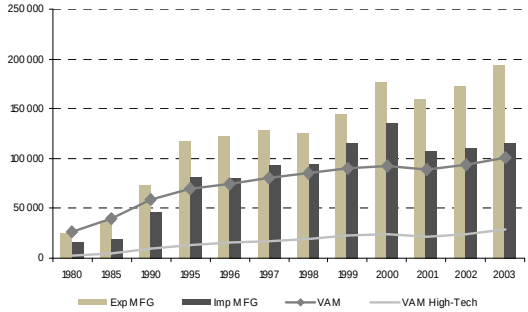


B. Selected Developing Asian Economies

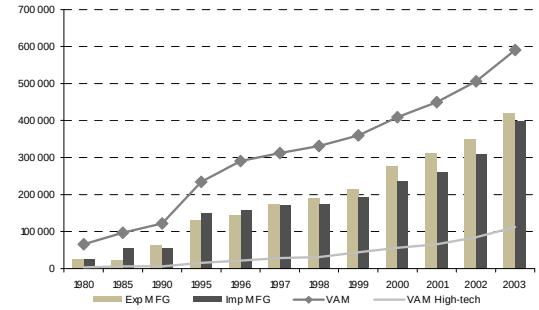
Republic of Korea



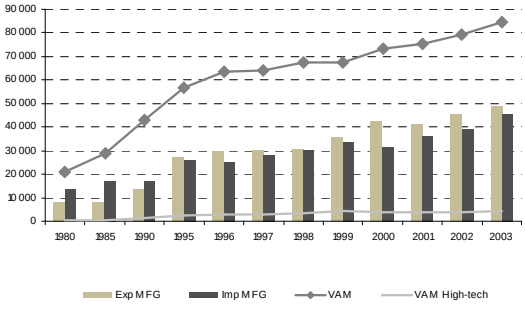
Taiwan Province of China



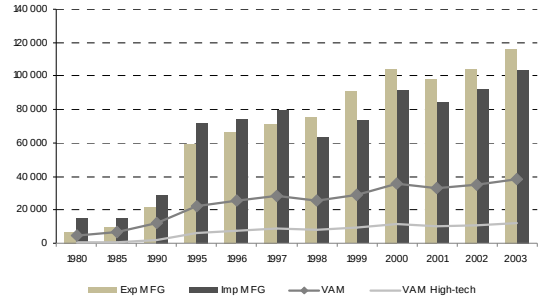
China



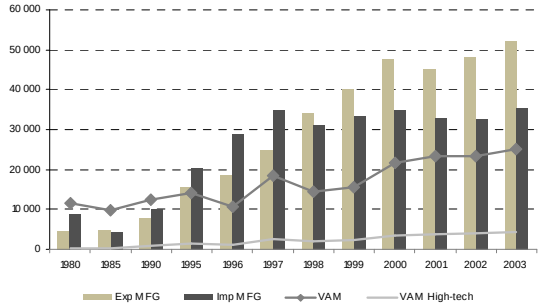
India



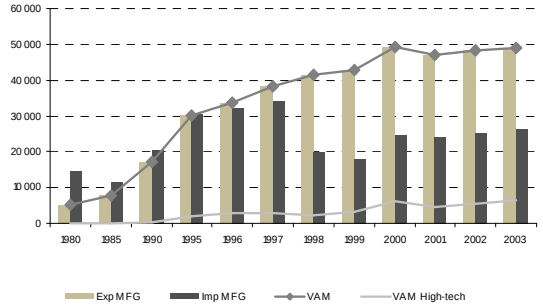
Malaysia



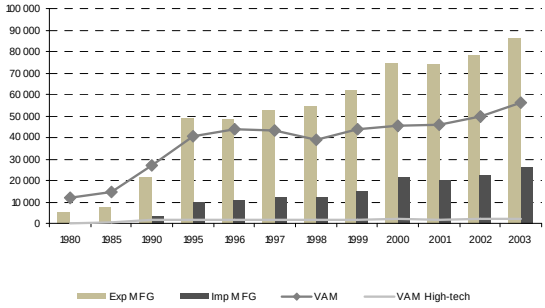
Philippines



Indonesia

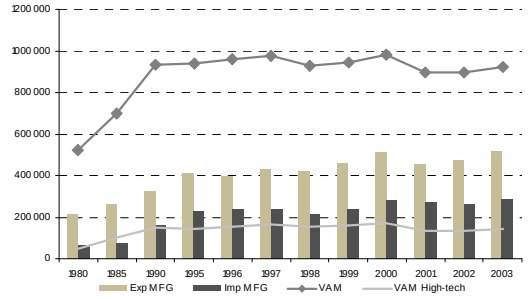


Thailand

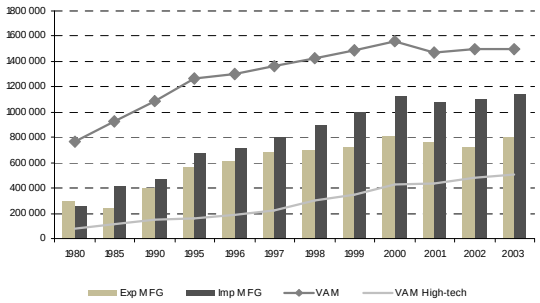


C. Selected Developed Economies

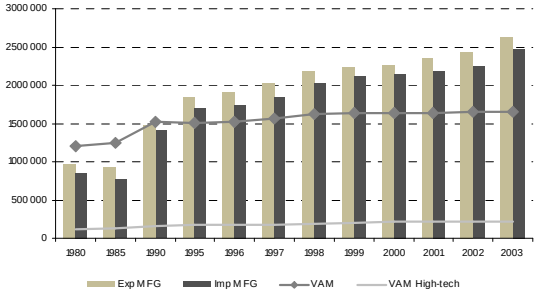
Japan



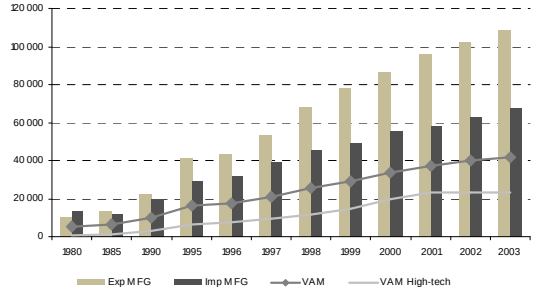
United States

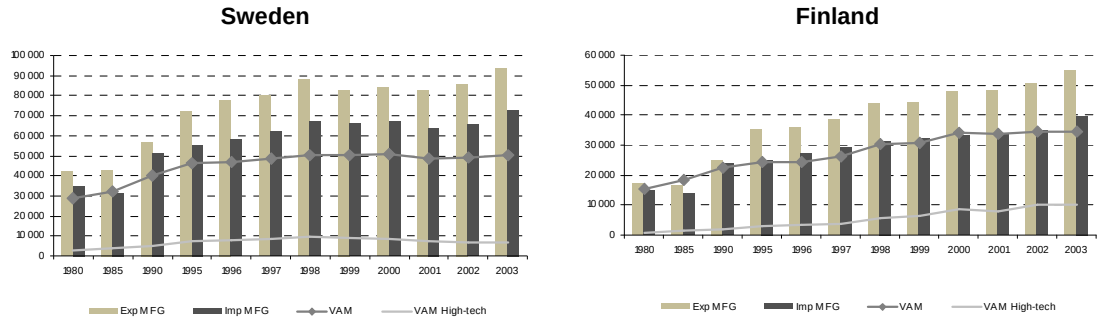


European Union (15)



Ireland





Source: Calculated in base of data from US National Science Board, Science and Engineering Indicators 2006.

B. Comparison in High-Tech Trade and High Tech MVA of Mexico and Costa Rica with several Asian countries

In terms of the high-tech exports and high-tech MVA performance, a country comparable to Mexico in Asia might be Malaysia.[8] Mexican manufactured trade (exports and imports combined) of this sector, at constant 2000 prices, reached almost US$ 100 billion in 2005 in which its exports has surpassed imports with a slight margin during the present decade (Figure 10). The chronicle trade deficit of this sector was reverted into the surplus position in the second half of the 1990s after the Tequila Crisis. The MVA of high-tech sector has stayed over a US$ 10 billon mark during the present decade. The revenue of the sector, which rose dramatically and during the second half of the 1990s after the Tequila Crisis has stagnated into the present decade.

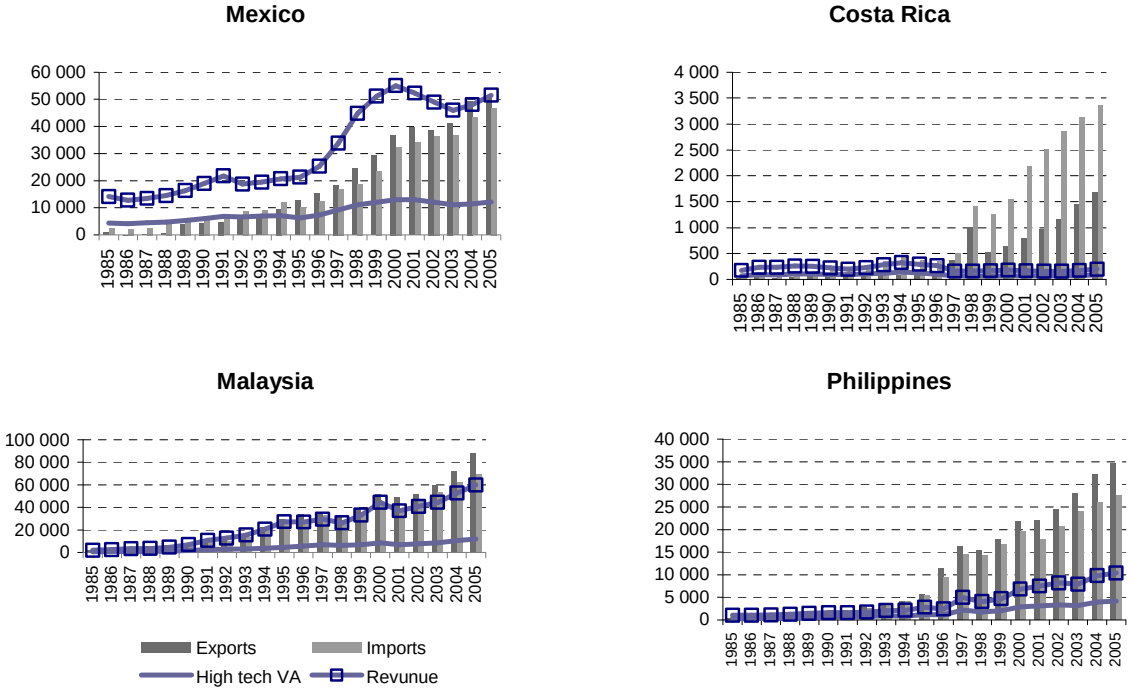
The Mexican performance in high-tech exports and value aggregation contrasts to that of Malaysia, and needless to say, that of other Asian countries such as China, Republic of Korea, Taiwan Province of China and Singapore (See Annex Figure 2 for these Asian countries, and other Latin American and several developed economies). Despite its small economic size, Malaysia not only exports more high-tech products and maintains a wider trade surplus in these products, but also generates a MVA that is comparable to Mexico's, roughly US 10 billion annually, at constant 2000 prices.

Another comparison, though of a different nature, can be made between Costa Rica and the Philippines (Figure 10). Both countries share a similar industrialization and export specialization pattern; both were basically exporters of a limited number of traditional agricultural products such as pineapples, bananas, sugar, and others before their integrating into the world economy, especially by inserting themselves into global semiconductor supply-chain networks of transnational corporations.[9] Although the Philippines is much poorer in terms of GDP per capita (US$1,640 in current dollars) than Costa Rica (US$5,700), the former exports ten times as much of high-tech products than the latter. More importantly, the Philippines has been able to generate MVA in that sector, roughly ten times larger than that of Costa Rica. This has been achieved with a consistent trade surplus in that sector.

[8] Malaysian goods exports and imports reached US$ 176 billon and US$ 147 billon in 2007while those of Mexico were US$ 272 billion and US$ 296 billion respectively. Trade per capital for Malaysia on average during 2005-2007 was US$ 12,700 in contrast to US$ 5,200 of Mexico during the same period. Mexico's GDP reached US$ 893 billon at current prices whereas that of Malaysia was US$ 181 billion (WTO 2008).

[9] Though the Philippines is much bigger in terms of population and GDP, Costa Rica surpasses the Asian country in the area of trade per capita (US$ 5,400 compared to US$ 1,300 of the Philippines) and the trade openness (trade to GDP ratio of 105 for 2005-2007 compared to 92 of the Philippines).

FIGURE 10
EVOLUTION OF HIGH TECH MANUFACTURING VA, HIGH TECH EXPORTS AND IMPORTS AND REVENUE, 1985-2005
(In Million Constant 2000 US Dollars)



Source: ECLAC's calculation based on US Science and Engineering Indicators, 2008.

Notes: High-technology manufacturing industries classified by Organisation for Economic Co-operation and Development (OECD) and include aerospace, communications equipment, office machinery and computers, pharmaceuticals, and scientific instruments. Value-added excludes purchases of domestic and imported materials and inputs. Constant dollar data for countries were calculated by deflating industry data valued in each country's nominal domestic currency with a sector-specific price index constructed for that country and then converted to U.S. dollars based on average annual exchange rates.

The case of the Philippines may be a typical case of the Asian pattern in which mutually reinforcing complementarities between exports and investment in manufacturing has been created and promoted by public policies in close alliance with the private sector. Quite aware of the drawbacks common among the high-tech sectors inserted "exogenously" into export processing zones or in-bond industries, as being "enclaves" in the national economy and as lacking backward and forward linkages, the authorities in Asian countries have encouraged the private sector to invest in more value-adding and knowledge promoting export activities (Lall et. al. 2004, UNIDO 2004, Kuwayama and Durán 2003). This way, those purely "processing zone-based" activities at the initial stage of industrialization have transformed into dynamic value-adding export sectors and an integral part of complex international supply chain networks.

C. Comparison in MVA, labour-productivity and manufactured exports between Brazil and the Republic of Korea

A comparative analysis between two developing countries, —Brazil and the Republic of Korea—, one in Latin America and the other in Developing Asia, sheds light on two different trade-investment links between industrialization and export specialization. Brazil's GDP in current dollars is 30% higher (US$ 1314 billion in 2007) than that of Korea (US$ 970 billion), while the former's trade per capita is one-tenth (US$ 1,453 during 2005-2007) of the latter's figure (US$ 15,642). Brazilian economy is much more closed:

the ratio of trade to GDP was roughly 26% during 2005-2007, in comparison with that for Korea of 86% (WTO 2008). The manufacturing value added (MVA) for Brazil in 2005 reached US$ 110 billion at constant 2000 prices, in comparison with that of US$ 185 billion for Korea in that same year.

In Korea a larger proportion of MVA originates from medium and high-tech industrial sectors while in the case of Brazil, natural resource-based and low-tech sectors weigh much more. In the former, the top five contributors of MVA are electric valves and tubes (13.6% of the total), basic iron and steel (6.5%), motor vehicles (5.9%) and TV/Radio transmitters (5.4%), and basic chemicals (4.2%), while in the latter, refined petroleum products (12.3%), basic iron and steel (6.8%), basic chemicals (6.4%), processed meat, fish, fruit and vegetables (6.2%), and other food products (5.4%) appear among the top five list (Table 5).

The contribution of MVA to total output in each ISIC sector for both countries is relatively similar, indicating that in many sectors, MVA in the sector in question represents less than half or even less than 40% of total output. However, in the case of Brazil, the share of combined MVA in total output is higher for Brazil (42%) than that for Korea (37%). For the majority of sub-sectors considered, with the exception of refined petroleum products (ISIC 2320), processing of nuclear fuel (2330) and several sub-sectors in low or medium-tech such as optical instruments and photographic equipment (3320) and watches and clocks (3330), in which Brazil records a higher MVA contribution to sectoral total output, the share of MVA in total output of each sector is roughly comparable between Brazil and Korea.

Capital-labour intensity, measured by the share of wages in MVA, does not differ noticeably between the two countries, with several important exceptions (e.g., lighting equipment and electric lamps); the nature of industrial activity or product itself seem more decisive of that intensity rather than factor endowment of the country per se. What really differentiates Korea from Brazil is that MVA per employee overall in the former is three times higher (US$ 112,000) than the latter (US$31,000). A huge gap between the two countries exists regardless of the technology intensity of the sector in question, whether in natural resource-based manufactures or low, medium or high-tech areas. In both countries, despite great heterogeneous patterns observed across sectors, labour productivity, measured in this manner, tends to go up in accordance with the technology intensity ladder. Value-added per employee in several traditional manufacturing sectors such as wearing apparel (1810), footwear (1920) and furniture (3610), which are highly export-oriented, is extremely low not only in Brazil but also when compared to the same sectors in Korea.

Another major difference between the countries is not only that Korea is much more export-oriented, but also that major MVA contributors are also major exporters of the country. The export-orientation of medium and high-tech sectors is usually much higher for Korea than Brazil. In the case of motor vehicles, for example, Korea exports more than half of its output, while Brazil does only 29%. The MVA per employee in this sector in Korea is also three times higher than that of Brazil. The highly exported oriented industries in Korea generally have higher wages per employee, higher productivity measured in terms of MVA per employee. In this manner, the major export sectors are also principle MVA generators as well as origins of productivity growth in the country.

The domestic market-orientation of Brazil does not explain its poor performance in MVA and labour-productivity. The inward-looking strategy of would have been justifiable if this strategy had been able to take full advantage of economies of scale that the market size provides and generate continuously rising MVA and productivity increases. However, during almost last three decades, Brazil has failed to increase its MVA (at constant prices), regardless of whether the sectors involved, high-tech or low tech alike (See Figure 9 again).

The same unchanging nature of MVA in Brazil is repeated in the case of Argentina or Mexico, though the former being a relatively “closed” country and the latter being a highly “opened” economy. This unchanging nature of industrial transformation and upgrading reflects the inadequacy of the import-substitution strategy based solely on the market size. On the other hand, the “openness” per se is not a determinant of the industrialization success or failure, the market size persuasion should not be used as an excuse for abandoning export promotion, as long as world markets disciplines national producers, promote technology transfer, and encourage investment in export activities which are conducive to value addition, knowledge creation and productivity enhancement.

TABLE 5
BRAZIL AND KOREA, CONTRIBUTION OF MVA AND WAGE TO OUTPUT, 2005, BY INDUSTRY (ISIU REVISION 3)

(In current million US dollars and Percentages)

		Value added				Wages of employees						Exports as % of output, ISIC 3 OR 4 digit code (in %)		
		share in output (In %)		Per employee (In US$)		Share in manufacturing industry (In %)		Share of wages in value added (In %)		Wages per employee (In US%)				
Industry (ISIC Revision 3)	**ISIC**	**Brazil**	**Korea**	**Brazil**	**Korea**	**Brazil**	**Korea**	**Brazil**	**Korea**	**Brazil**	**Korea**	**Brazil**	**Korea**	
Processed meat,fish,fruit,vegetables,fats	**151**	33.0	31.0	27 005	56 393	6.2	1.1	17.0	27.7	4 446	15 634		Processing/preserving of fish (1512)	33.6
Dairy products	**1 520**	30.0	42.6	26 584	229 758	1.2	0.8	19.0	12.6	4 894	28 900	1.7		0.3
Grain mill products; starches; animal feeds	**153**	32.0	26.7	37 077	164 496	1.8	0.9	17.0	15.1	5 962	24 818		Grain mill products (1531)	1.6
Other food products	**154**	45.0	44.8	18 498	83 439	5.4	2.0	24.0	22.1	4 348	18 423		Sugar (1542)	0.6
Beverages	**155**	52.0	58.8	41 012	293 726	3.7	1.3	16.0	9.6	6 327	28 129		Distilling, rectifying & blending of spirits (1551)	7.1
Tobacco products	**1 600**	42.0	56.2	60 349	642 486	0.7	0.5	17.0	6.1	9 853	39 386	1.6		9.4
Spinning, weaving and finishing of textiles	**171**	39.0	41.1	14 509	53 863	1.2	1.5	33.0	34.2	4 657	18 395		Textile fibre preparation; textile weaving (1711)	53.9
Other textiles	**172**	43.0	37.4	13 881	63 796	0.8	0.9	32.0	29.3	4 325	18 706		Made-up textile articles, except apparel (1721)	13.2
Knitted and crocheted fabrics and articles	**1 730**	37.0		12 456		0.2		34.0		4 167		15.2		
Wearing apparel, except fur apparel	**1 810**	43.0	50.8	5 968	58 453	1.5	2.0	47.0	27.4	2 780	16 020	6.0		13.8
Dressing & dyeing of fur; processing of fur	**1 820**		47.5		98 077		0.1		20.8		20 356			4.9
Tanning, dressing, processing of leather	**191**	31.0	34.5	12 168	67 596	0.5	0.3	31.0	28.7	3 697	19 386		Tanning and dressing of leather (1911)	61.9
Footwear	**1 920**	46.0	44.8	8 036	47 157	1.3	0.3	40.0	35.4	3 190	16 712	34.4		25.9
Sawmilling and planing of wood	**2 010**	49.0	36.0	11 257	59 899	0.6	0.1	29.0	29.7	3 263	17 764	64.1		0.8
Products of wood, cork, straw, etc.	**202**	44.0	33.4	13 302	59 859	0.9	0.4	30.0	34.8	3 939	20 823		Veneer sheets, plywood, particle board, etc. (2021)	3.1
Paper and paper products	**210**	46.0	36.0	33 944	89 007	3.6	1.7	20.0	26.6	8 788	23 705		Pulp, paper and paperboard (2101)	23.7
Publishing	**221**	65.0	59.7	18 307	91 571	2.3	1.5	27.0	27.8	8 864	25 410		Publishing of books and other publications (2211)	2.5
Printing and related service activities	**222**	58.0	51.9	18 307	56 872	0.6	0.8	27.0	36.8	4 918	20 949		Printing (2221)	2.5
Reproduction of recorded media	**2 230**	61.0	58.4	96 734	96 395	0.3	0.0	12.0	24.1	10 934	23 206		Service activities related to printing (2222)	0.1
Coke oven products	**2 310**	40.0		65 432	-			10.0		6 203		0.4	...	
Refined petroleum products	**2 320**	67.0	18.2	845 948	1 165 647	12.3	3.5	5.0	5.4	37 222	63 455	7.4		26.1
Processing of nuclear fuel	**2 330**	35.0	63.0	23 524	122 464	-	0.0	16.0	36.0	14 915	44 087			1.4
Basic chemicals	**241**	29.0	26.1	94 086	284 430	4.7	4.2	25.0	13.2	12 568	37 617		Plastics in primary forms; synthetic rubber (2413)	64.9
Other chemicals	**242**	45.0	50.4	51 488	160 621	6.4	4.0	21.0	16.2	11 133	25 987	22.3	Pesticides and other agro-chemical products (2421)	5.2
													Paints, varnishes, printing ink and mastics (2422)	16.1
													Pharmaceuticals, medicinal chemicals, etc. (2423)	10.1
Man-made fibres	**2 430**	43.0	33.0	55 638	192 274	0.2	0.4	27.0	16.0	7 718	30 752			51.8
Rubber products	**251**	44.0	47.2	29 007	99 269	1.3	1.3	30.0	23.7	5 707	23 518	4.9	Rubber tyres and tubes (2511)	56.9
													Other rubber products (2519)	8.9
Plastic products	**2 520**	38.0	36.9	19 479	68 145	2.5	3.5		30.1		20 497			13.1
Glass and glass products	**2 610**	53.0	51.0	38 467	142 267	0.6	1.1	22.0	18.8	8 244	26 751	15.6		13.1
Non-metallic mineral products n.e.c.	**269**	49.0	44.2	18 223	117 910	2.6	2.3	26.0	19.9	4 711	23 424		Pottery, china and earthenware (2691)	15.5
Basic iron and steel	**2 710**	44.0	32.2	114 931	276 774	6.8	6.5	12.0	13.1	13 472	36 302	29.7		23.4
Basic precious and non-ferrous metals	**2 720**	37.0	22.0	70 108	146 135	1.6	1.3	17.0	18.3	11 351	26 722	45.6		26.3
Casting of metals	**273**	42.0	35.1	15 628	77 970	0.3	0.4	37.0	30.3	5 654	23 652		Structural metal products (2811)	6.6
Struct.metal products;tanks;steam generators	**281**	46.0	33.5	15 756	75 272	0.8	1.7	34.0	32.1	5 257	24 122		Tanks, reservoirs and containers of metal (2812)	20.1
													Steam generators (2813)	13.2
Other metal products; metal working services	**289**	46.0	43.2	22 420	61 157	3.3	3.4	28.0	33.6	6 119	20 558		Cutlery, hand tools and general hardware (2893)	32.7
													Other fabricated metal products n.e.c. (2899)	32.6
General purpose machinery	**291**	42.0	37.3	28 173	86 973	2.4	3.6	32.0	27.7	8 965	24 055		Engines & turbines(not for transport equip.) (2911)	19.0
													Pumps, compressors, taps and valves (2912)	38.8
Special purpose machinery	**292**	44.0	38.3	25 960	77 635	2.8	3.9	33.0	31.7	8 363	24 582		Agricultural and forestry machinery (2921)	14.8
													Machine tools (2922)	30.4
													Machinery for metallurgy (2923)	56.4
Domestic appliances n.e.c.	**2 930**	36.0	35.9	30 115	111 465	0.7	1.2	27.0	20.0	8 083	22 330	16.9		35.2
Office, accounting and computing machinery	**3 000**	31.0	37.7	40 568	112 841	0.6	1.0	27.0	21.5	10 645	24 274	13.7	...	
Electric motors, generators and transformers	**3 110**	43.0	32.3	27 184	64 640	0.6	0.8	33.0	34.2	8 732	22 100	32.9		25.7
Electricity distribution & control apparatus	**3 120**	51.0	38.5	31 322	75 677	0.5	1.0	34.0	29.0	10 545	21 946	15.2		17.9
Insulated wire and cable	**3 130**	28.0	28.8	32 363	103 181	0.3	0.5	25.0	22.4	7 810	23 153	8.8		17.5
Accumulators, primary cells and batteries	**3 140**	37.0	37.6	23 288	86 833	0.1	0.2	35.0	29.7	7 944	25 770	25.1	...	
Lighting equipment and electric lamps	**3 150**	43.0	41.2	14 321	61 663	0.1	0.3	65.0	31.6	9 192	19 473	12.3		28.4
Other electrical equipment n.e.c.	**3 190**	41.0	34.2	22 936	71 821	0.6	0.6	32.0	29.4	7 324	21 094	14.6		85.3
Electronic valves, tubes, etc.	**3 210**	34.0	52.3	22 700	172 915	0.3	13.6	32.0	16.4	7 166	28 391	21.7		37.0
TV/radio transmitters; line comm. apparatus	**3 220**	29.0	37.1	80 587	208 239	1.3	5.4	20.0	11.8	15 907	24 660	15.6		47.0
TV and radio receivers and associated goods	**3 230**	32.0	36.4	50579	89 819	0.7	1.6	17.0	33.1	8 230	29 711	12.3		
Medical, measuring, testing appliances, etc.	**331**	55.0	45.4	26 488	66 859	0.7	0.9	31.0	32.7		21 869		Medical, surgical and orthopaedic equipment (3311)	38.9
													Measuring/testing/navigating appliances,etc. (3312)	34.3
Optical instruments & photographic equipment	**3 320**	60.0	37.9	19 537	66 080	-	0.3	26.0	31.0	4 898	20 465	13.7		
Watches and clocks	**3 330**	63.0	38.3	35 476	44 242	-	0.0	22.0	45.9	7 568	20 299	2.3		50.1
Motor vehicles	**3 410**	29.0	32.4	76 541	216 872	4.4	5.9	23.0	24.0	17 159	51 971	28.8		52.7
Automobile bodies, trailers & semi-trailers	**3 420**	34.0	34.5	19 831	75 472	0.4	0.1	36.0	29.4	7 121	22 198	14.9		8.5
Parts/accessories for automobiles	**3 430**	37.0	33.3	32 891	86 495	3.7	4.2	30.0	29.1	9 768	25 163	21.9		21.0
Building and repairing of ships and boats	**351**	39.0	31.3	19 460	100 261	0.2	3.0	40.0	40.4	7 766	40 539		Building and repairing of ships (3511)	57.9
													Building/repairing of pleasure/sport. boats (3512)	84.3
Railway/tramway locomotives & rolling stock	**3 520**	50.0	43.9	38 009	156 416	0.3	0.2	24.0	22.7	8 836	35 435	13.8		4.2
Aircraft and spacecraft	**3 530**	35.0	46.9	61 425	99 819	0.8	0.2	31.0	37.2	18 958	37 132	86.9		41.8
Transport equipment n.e.c.	**359**	31.0	35.9	40 988	59 511	0.6	0.1	22.0	38.0	8 689	22 608		Motorcycles (3591)	35.5
													Bicycles and invalid carriages (3592)	52.3
													Other transport equipment n.e.c. (3599)	9.9
Furniture	**3 610**	38.0	35.9	9 721	62 608	1.0	0.9	39.0	30.3	3 706	18 997	21.4		5.9
Manufacturing n.e.c.	**369**	56.0	42.4	13 821	49 136	0.6	0.5	33.0	36.6	4 530	17 994		Jewellery and related articles (3691)	77.3
Recycling of metal waste and scrap	**3 710**	44.0	21.4	20 472	111 729	-	0.1	30.0	20.9	5 972	23 292			
Recycling of non-metal waste and scrap	**3 720**	58.0	42.0	10 702	60 175	-	0.1	29.0	29.6	3 025	17 785			
Total manufacturing		**42.0**	**36.7**	**30 834**	**111 989**	**100.0**	**100.0**	**22.0**	**22.4**	**6 599**	**25 109**			

Source: UNIDO Industrial Statistical Yearbook, 2008.

D. Maquila Exports and MVA in Central America

For each of the five Central American countries, maquiladora and processing-zone exports represent between 40% and 60% of total exports; for Central America as a whole, these exports accounted for 56% of total goods exports of these countries in 2006. The share of maquilas in total exports is particularly high for Honduras and Costa Rica. In addition, maquiladora and processing-zone exports account for a lion share of manufactured exports of each country; the Central Banks' estimates indicate that total maquiladora and free-zone exports of the five countries combined (US$ 11.0 billion) reached almost the same size of total manufactured exports (US$10.5 billion) originating from outside these special zones in 2006 (ECLAC 2009a).

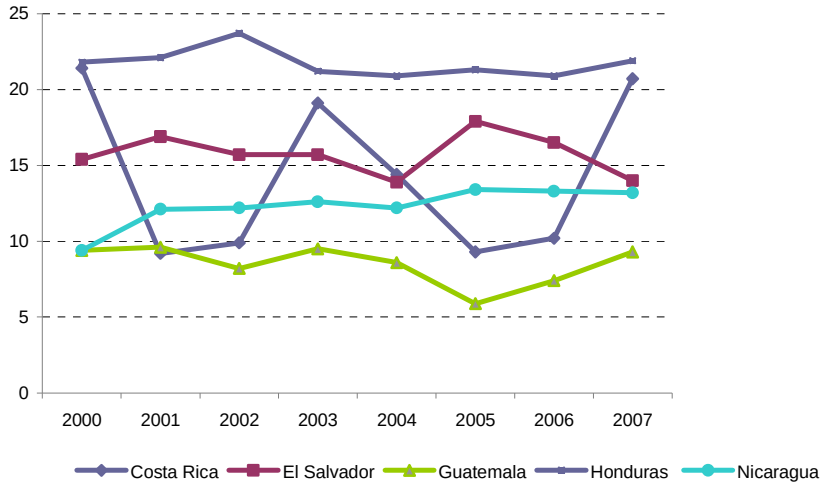
By industry, the textiles and apparel sector has been the most dominant accounting for almost 40% of total maquila-related exports in 2006, followed by the electrical and electronics sector which has grown to represent an important part of total maquila exports representing roughly 48% and 12% of total maquila exports of Costa Rica and Nicaragua, respectively (ECLAC 2009b). In this sub-region, attraction of FDI has been a key of export promotion strategy towards outside its proper region. The majority of inward FDI to this sub-region has traditionally originated from the United States and has concentrated in assembly-type activities of the apparel industry and more recently in electrical and electronic equipment and medical device manufactures and in recent years in services sectors.

The share of manufacturing value-added in total value-added has been stable over the years, ranging between 17% (Nicaragua) and 23% (El Salvador) in 2006. In comparison, the relation between maquila value-added and manufacturing value-added has been in favor of the former, with its share increasing substantially over the last ten years; in the case of Costa Rica, more than 40% of total manufacturing value-added originates from the special zones. However, manufacturing value-added as percentage of total exports still remain at a low level of less than 25% (Figure 11).

FIGURE 11

CENTRAL AMERICA: MANUFACTURING VALUE ADDED AS PERCENTAGE OF TOTAL EXPORTS

(In percentages)



Source: authors' calculations based on ECLAC, "Ismo Centroamericano: Estadísticas del sector manufacturero y de la industria de exportación", LC/MEX/L892, ECLAC Mexico, January 16, 2009.

The share of value added in total exports from the processing zones in Costa Rica has been declining for some traditional sectors such as textiles, clothing, leather and shoes, while it continues to

increase for other traditional sectors as in plastic, rubber, and their manufactures. The shares for high-tech exports such as machinery, electrical materials and components as well as precision instruments and medical equipment and chemicals and pharmaceuticals are not only low in general but also are declining (Table 6). Value-added of maquilas as percentage of exports has remained unchanged since the turn of the century. This contrasts well with the percentage of exports in the services sector which has been expanding rapidly.

TABLE 6
COSTA RICA: VALUE-ADDED AS PERCENTAGE OF EXPORTS FROM THE PROCESSING ZONES*
(In percentages)

	2001	2002	2003	2004	2005	2006
Machinery, electrical materials and components	25.4	28.5	17.9	24.8	23.9	18.3
Precision instruments and medical equipment	62.7	48.0	55.2	60.9	45.5	14.8
Agroindustry	93.5	57.0	50.7	43.9	30.2	20.7
Textiles, clothing, leather and shoes	25.3	34.1	41.1	35.9	35.1	33.7
Services	25.5	90.5	106.9	152.3	187.3	148.1
Plastic, rubber and their manufactures	49.3	64.2	57.0	50.4	197.5	174.1
Chemical and pharmaceutical products	45.2	33.4	5.2	8.1	59.1	4.2
Metal products	44.0	35.6	48.2	38.1	37.6	19.3
Agriculture and livestock	86.7	92.6	83.7	4.3	3.0	9.6
Total	39.3	43.4	38.1	43.3	39.8	25.5

Source: Procomer, cited in Jose Cordero and Eva Paus, Working Group on Development and Environment in the Americas, Discussion Paper No. 13, April 2008.

* Value added in this case is understood as equal to exports – imports + change in inventories –remittances – taxes – consultancy fees abroad.

In the case of Costa Rica, Intel installation in the country has changed drastically its export structure; the company has been responsible for most of electronic machinery exports and 39% of processing-zone exports and 20% of the country total exports. The impressive export spurt based on high-tech products is however still characterized by its nature of being a processing zone, highly dependent on imported inputs and parts. As a result, the impact of the free zones on the balance of payments is substantially smaller than what would be expected of the large export figures and shares.

In a small developing country like Costa Rica where FDI in manufacturing and IT-enabled services is primarily "efficiency-seeking", the most obvious potential channels for spillovers are backward linkages, and training and education. With respect with the first, Cordero and Paus (2008) show that this has been quite limited; although TNC purchase of domestic goods and services have expanded in absolute terms, they have declined in relative terms. This limitedness arises from two factors: i) most of high-tech products produced by FDI is at the low-end of the spectrum of technology intensity; and ii) the large high-tech in Costa Rica source their major inputs from the company-internal global network. Regarding the latter, the high-tech sectors employ a larger percentage of skilled workers who provide further knowledge transfer, greater labour mobility and higher wages. Undoubtedly, there have some important learning spillovers, but knowledge linkages have been quite limited. Moreover, there has been little movement up the value-chain by the transnational corporations operating in the country. Instead, the trend has been to diversify into IT-related services rather than more advanced production activities (Cordero and Paus 2008).

For most of the countries in the sub-region, integration into international trade flows is based largely on the manufacture of garments for export to the United States under preferential arrangements. Though the sale of these products to the United States market triggered a significant change in the pattern of exports with strong inroads in low-technology manufactures, the benefits generated by way of

production sharing were fairly limited. The incorporation of local inputs was penalized while it unleashed an "incentives war" among countries eager to attract investment (Mortimore and Peres, 2001). In addition, growing competition among developing countries to attract FDI in order to enter such markets may lead to problems relating to "fallacy of composition".

In contrast to many developing Asian countries that have successfully used the apparel industry as a springboard to deepen the industrialization process, the assembly-type exports based on low-wage export processing zones have not produced the desired developmental results in the Caribbean Basin countries. The apparel firms operating there tend to be subsidiaries of branded manufacturers or foreign or national firms that compete for maquila assembly contracts from the overseas buyers of the large United States retailers. The overseas buyers, or the branded manufacturers themselves, tend to handle all aspects of the services required except the assembly process based on low-wage, while Asian producers tend to provide "full-package" services that leads to the complete article required by the retailer (Bair and Dussel Peters 2006). Therefore, the exports do not represent an outreach of local industrialization capacity and process.

When the maquiladora promotion strategy was devised, the issue of promoting local productive linkages was not deemed relevant because it was considered mainly as part of employment policies and later seen as a foreign-exchange earner. In certain cases maquila plants contribute to the formation of human resources and introduce modern concepts of organization and management. However, the change from maquila activities into the high-tech maquila industry that has been observed in Mexico and Central America may not be sufficient for maquila to become a major source of technology absorption.

Since the maquila industry today has reached such a magnitude not only in trade and but also productive structure of these countries, it is now necessary to consider maquila as an integral part of industrial and trade policy in order that maquila plants would evolve into more knowledge-intensive activities which simultaneously promote the creation of local suppliers and the linkages with them. Only by strengthening local productive and technological capabilities, maquila can transform into activities of higher local value-added content, with stronger internal linkages.

E. Role of Foreign Direct Investment (FDI) in industrialization and Export Promotion

Whether FDI generates "crowding-in" or "crowding-out" effects in domestic investment depends on the host country's capacity to take advantage of such financial flows that are generally scarce in developing countries. The relationship between FDI and domestic investment is likely to be complimentary when investment is in an undeveloped sector of the economy (owing to technological factors or lack of knowledge of foreign markets). But the FDI is more likely to substitute for domestic investment when it takes place in sectors where there are plenty of domestic firms or when domestic firms already have access to technology that the TNCs bring into the country. Even where FDI does not displace domestic investment, foreign investments may not stimulate new downstream or upstream production and therefore might fail to exert crowing-in effects on domestic investment (Agosin and Mayer 2000).

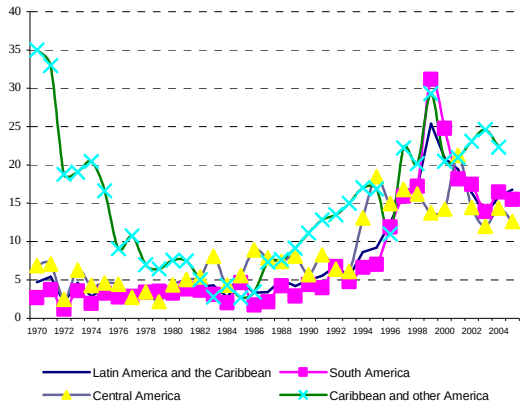
This concern raises important questions especially when FDI represents a significant and growing share of total gross fixed capital formation (GFCF) of the developing host country where FDI is a much larger proportion of investment than in developed countries —the share of the latter has been in the range of 6-7% whereas in the case of the first in a range of 9% to 13% during 2002 and 2005. A comparison between the two regions on the magnitude of inward FDI flows as a percentage of GFCF shows that Latin America and the Caribbean has relied more on FDI for physical investment than Developing Asia (Figures 12-A and 12-B). The Latin American case shows a sharp increase to 1999 and then a clear downward trend afterwards, regardless of its three sub-regions considered. In the case of Asia, the share of FDI inflows in GFCF is smaller and is less volatile.

In the case of Latin America and the Caribbean, apart from large literature on FDI in Central American maquila operations, studies that show the lack of FDI capacity to create backward and forward linkages in the national economy abound. For example, in his analysis on Mexico by industrial sector, Dussel Peters (2008) shows that against relatively steady FDI inflows into the country during 1994 and 2006, the share of new investments has diminished sharply, but the shares of mergers and acquisitions, and reinvestments, have increased, while the contribution of FDI to GDP and GFCF has declined. He finds that the twenty most important industries in terms of FDI exhibit a lack of job creation, a growing gap between productivity and wages, a growing trade deficit, and a lack of R&D expenditures and concludes that "FDI flows to Mexico offer potential that has yet to be successfully exploited. A new long-term strategy is needed to promote and attract FDI that will transfer knowledge, technology and value added to Mexico." (p.15).

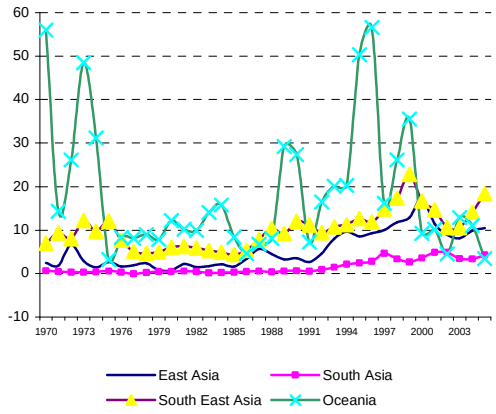
In Asia, a small group of developing countries has shown dynamic production and export structures, with rising shares of technology-intensive products during the last three decades. These include Singapore, Hong Kong (SAR), Republic of Korea, China, Taiwan Province of China, Malaysia, Indonesia, India and Thailand. Despite a similar industrialization pattern of these countries, they have followed different strategies and policies to take advantage of FDI in creating their supply-side capacities.

FIGURE 12
INWARD FDI FLOWS AS A PERCENTAGE OF GROSS FIXED CAPITAL FORMATION, BY HOST REGION, 1970 – 2005

A. Latin America and the Caribbean



B. South and East Asia, Oceania



Source: UNCTAD, World Investment Report 2006, statistical annex.

The Republic of Korea and Taiwan Province of China purchased foreign technology through arms-length and combined domestic research efforts and a constraint on inward FDI. At first, these two countries used strong industrial policies, targeting the activities they wish to enter and the functions they wish to upgrade. On the other hand, Singapore and China have managed to combine their reliance on FDI with a strong dose of industrial policy. Singapore has been successfully participating in high-tech value chains, while developing local skills and physical infrastructure. In contrast, Malaysia, the Philippines, and Indonesia, have relied on FDI but used passive industrial policies. China followed a different route of getting foreign technology, management know-how through FDI, royalties and licenses, combined with local R&D efforts, skills and infrastructure building (Lall 2000, UNDP 2004).

However, an important common feature of the East Asian success is that the governments have actively participated in and provided support on the catching-up process. Singapore and Malaysia, for example, have instituted sophisticated investment promotion agencies, designed to reach strategic

industrial development goals. Singapore has implemented its Productivity and Standards Board (PBS) which serves as a key guide for domestic firms in bringing up their standards to more exigent international ones. Taiwan Province of China has also established increasingly sophisticated instructions, centers, and inspection procedures for quality control of manufactured goods needed for export performance.

F. Internationalization of SMEs

Generally speaking, SMEs are local market-oriented. The majority of their businesses are not nationwide, but rather focused on local and small niche markets. On the other hand, a small number of SMEs have succeeded in developing export markets and ground their competitiveness in their strong domestic bases. Asian SMEs are known to be more export-oriented than Latin American counterparts (Kuwayama 2001, Kuwayama, Ueki and Tsuji 2005). In addition to the geographical location, the export orientation of SMEs depends on industrial structure and cost competitiveness in their home countries.

In both regions, compared to the significant importance of SMEs in terms of number of firms and employment, their contributions to production and value creation are moderate. The gap between establishment/employment and output/value-added indicates lower productivity for SMEs. The ratios of value-added to employment are, for example, 0.85 for Japanese SMEs, which achieve the highest efficiency, and 0.56 for Thailand and 0.52 for El Salvador, which are the lowest (Table 7).

TABLE 7
CONTRIBUTION OF SMES TO ECONOMIES

	Establishment	Employment	Output/Sales	Value Added/GDP	Trade
China	95.2% (2002)	65.5% (2002)	54% (2002)		61.2% (2002)
Japan	99.7% (2001)	66.9% (2001)	51.1% (2002)	57.0% (2002)	14.5% (2003)
Republic of Korea	99.9% (2007)	88.4% (2007)	50.8% (2002)	51.9% (2002)	31.8% (2007)
Singapore	90% (2002)	52% (2002)		31% (2002)	
Thailand	99.6% (2002)	69.0% (2002)		38.9% (2002)	38.2% (2002)
Viet Nam	96% (2003)	25-37% (2003)	31% (2003)	26% (2003)	
Argentina	99% (1993)	73% (1993)		60% (1993)	8.8% (2001-02)
Brazil	99.7% (2002)	67.0% (2002)		20%	22% (1Q, 2004)
Chile	99.0% (2001)	70% (2000)	21.7% (2001)		16% (2003)
Colombia	91.8% (2000)	46.5% (2000)	36.4% (2000)	32.3% (2000)	31%
El Salvador	99.4% (2002)	87.1% (2002)		45.3% (2002)	
Mexico	99.7% (1999)	64%		42%	
Peru	99.7% (2001)	76.6% (2004)			

Source: Mikio Kuwayama, Y. Ueki and M. Tsuji eds., (2005)

Note: The contribution of employment in Viet Nam: 25% of the country's regular job supply; and 36.6% of the regular jobs employed by private firms. Employment by micro & small firms for Chile and Peru. Manufacturing sector for Colombia.

The contributions to exports by SMEs are more varied among countries (Table 6). Compared to Latin America, SMEs in the manufacturing exporter countries are more export-oriented; in Japan, however, only 14.5% of total exports were represented by exports of SME-driven manufacturing products, which are defined as products for which more than 70% of which were shipped by SMEs in 2000 (Kuwayama, Ueki and Tsuji 2005). Korean SMEs carried out more than 31% of the country’s total exports on average during 2007 and 2008 (Table 8). In the latter, the majority of Korean SME exports originate from manufacturing and especially from the electronics and electrical and machinery sectors, both representing more than half of SME exports on average during 2007 and 2008. Machinery exports by SMEs accounted for 75% of total Korean exports of that sector, while SMEs exported more than a quarter of total electronics and electrical product exports of the country during the biennium. The importance of SMEs as a vehicle for the enterprise internationalization process is also orchestrated by the fact that Korean SMEs are also active global investors. During 2006 and 2008, they invested roughly

US$ 5 billion annually in the overseas. Of this total more than two thirds were directed towards Asia while Latin America received approximately US 400 million annually with a share of 8% (Korea, SMBA online).

TABLE 8

EXPORTS AND FDI BY KOREAN SMES

(In US million dollars and percentages)

	Exports (2007/2008 Average)					FDIs by SMEs (2006/2008 Average)			
	Total		SMEs		SMEs/Total	No. of	% of Total	Amount	% of Total
	US$ Million	% of Total	US$ Million	% of Total		cases		US$ Million	
Asia	201 421	50,8	152 483	61,2	75,7	8 328	81,3	3 396	68,0
North America	49 854	12,6	30 038	12,0	60,3	1 025	10,0	590	11,8
Europe	73 949	18,6	32 784	13,2	44,3	407	4,0	380	7,6
Latin America	29 417	7,4	9 879	4,0	33,6	158	1,5	399	8,0
Middle East	23 184	5,8	15 993	6,4	69,0	119	1,2	61	1,2
Oceania	9 600	2,4	4 534	1,8	47,2	46	0,4	39	0,8
Africa	8 821	2,2	3 475	1,4	39,4	166	1,6	126	2,5
Others	504	0,1	98	0,0	19,4		-		0,0
Total	396 748	100,0	124 649	100,0	31,4	10 249	100,0	4 991	100,0

Source: SMBA.

The inwardness of Latin American SMEs becomes evident when data on SME exporters in four Latin American countries (Argentina, Brazil, Chile and Colombia) are compared with the Korean counterparts. In these four countries, although more than 80% of the exporting companies are SMEs, exports by large firms account for more than 75% in value terms. Those percentages surpass 95% when medium and large firms together are considered (Table 9).

TABLE 9

NUMBER AND VALUE OF EXPORTING FIRMS IN SELECTED LATIN AMERICAN COUNTRIES, 2004, BY SIZE *

(In US million dollars and percentages)

	Argentina				**Chile**			
	Number of exporting firms		Exports (million of dollars)		Number of exporting firms		Exports (million of dollars)	
Large	649	5,2	21 026	87,9	697	17,5	9 138	76,3
Medium	680	5,4	1 731	7,2	567	14,2	976	8,1
Small	3 516	28,0	837	3,5	1,523	38,1	625	5,2
Total SMEs	4 196	33,5	2 568	10,7	2,090	52,3	1 601	13,4
Micro	7 432	59,2	99	0,4	814	20,4	18	0,2
Other	267	2,1	235	1,0	393	9,8	1 220	10,2
Total	**12 544**	**100,0**	**23 928**	**100,0**	**3,994**	**100,0**	**11 977**	**100,0**
	Brazil *				**Colombia**			
	Number of exporting firms		Exports (million of dollars)		Number of exporting firms		Exports (million of dollars)	
Large	1 672	8,4	102 209	74,3	1 026	11,1	8 818	86,8
Medium	3 609	18,1	18 140	13,2	896	9,7	502	4,9
Small	7 030	35,2	1 758	1,3	3 404	36,8	355	3,5
Total SMEs	10 639	53,3	19 898	14,5	4 300	46,4	857	8,4
Micro	5 968	29,9	149	0,1	3 659	39,5	79	0,8
Special Micro & Medium **	1 530	7,7	15 348	11,2				
Other	147	0,7	2	0,0	277	3,0	404	4,0
Total	**19 956**	**100,0**	**137 605**	**100,0**	**9 262**	**100,0**	**10 158**	**100,0**

Source: FUNDES, Estudio comparado sobre el éxito exportador PYME en Argentina, Chile y Colombia, 2007, FUNDES (2007), Coordinadores: Dario Milesi, Virginia Moori Koenig y Gabriel Yoguel. SEBRAE (2008), As Micro e Pequenas Empresas na Exportação Brasileira, 1998 – 2006, Serviço Brasileiro de Apoio às Micro e Pequenas Empresas, Brasilia.

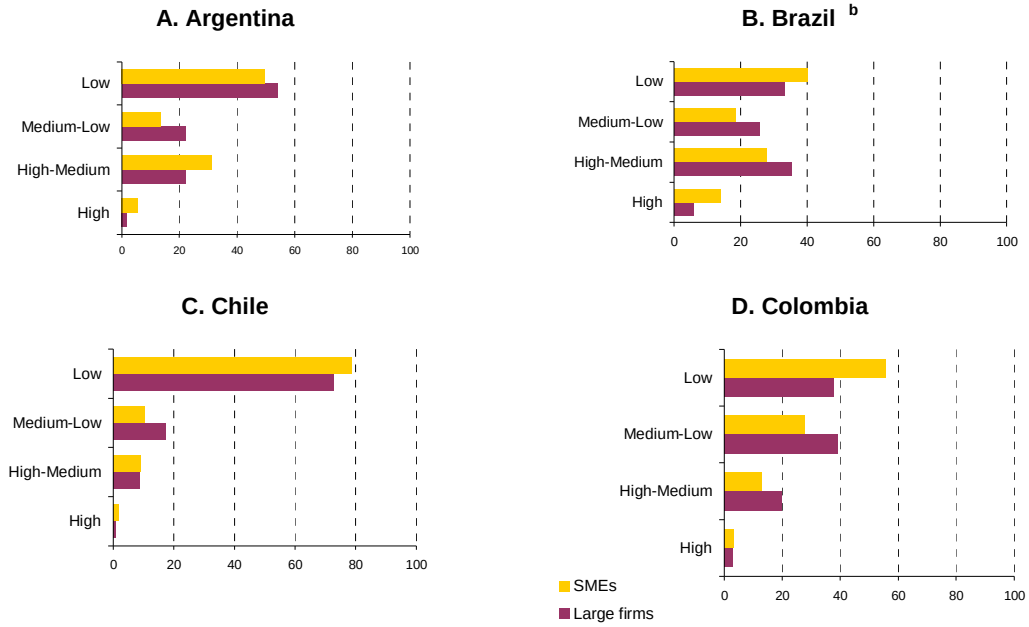
* Refers to 2006.

** Special Micro and Medium enterprises (with less than 100 employees in manufacturing and less than 50 employees in trade and services) whose annual exports exceed 1.2 million dollars in 2006.

Despite their general low export-orientation and a high sectoral concentration in a limited number of industries —particularly in foods and beverages, tobacco, chemical products, petroleum refining, and metal-mechanics related products—, the trade profile of Latin American SMEs is more diversified and differs substantially from that of large firms. The export basket of Latin American SMEs is less concentrated; their shares are relatively high for not only skilled and non-skilled labour-intensive sectors but also for a range of manufactures with product differentiation that require economies of scale and are more prone to national supply value chain linkages in goods and services. On the other hand, although they coexist with SMEs in certain sectors, large exporting companies are more present in capital-intensive sectors that enjoy economies of scale and natural resource-related industries (FUNDES 2007, SEBRAE 2008).

When measured in terms of technological intensity of products, exports of Latin American SMEs are skewed towards low-tech products, as in the case of Chile. However, Argentinean and Brazilian SMEs as a whole show a higher export specialization in more technological complex areas than in other industrial fields (Figure 13). In the case of Colombia, the export basket of both large firms and SMEs shows a higher concentration in low-tech sectors and then low-medium ones.

FIGURE 13
ARGENTINA, BRAZIL, CHILE AND COLOMBIA, MANUFACTURED EXPORTS, BY SIZE OF EXPORTING FIRM AND BY TECHNOLOGICAL INTENSITY, 2004 [a]/
(En porcentajes)



Source: FUNDES, Estudio comparado sobre el éxito exportador PYME en Argentina, Chile y Colombia, 2007, FUNDES (2007), Coordinadores: Dario Milesi, Virginia Moori Koenig y Gabriel Yoguel. SEBRAE (2008), As Micro e Pequenas Empresas na Exportação Brasileira, 1998 – 2006, Serviço Brasileiro de Apoio às Micro e Pequenas Empresas, Brasilia.

[a] SMEs do not include micro enterprises.

[b] Reffers to 2006.

When examined from the viewpoint of SMEs export destination, there seems to be little difference between large firms and SMEs in manufactured exports. However, there exists a certain pattern of regional specialization: i) exports by Argentinean SMEs are more oriented towards el American Continent (MERCOSUR and Andean Community and Canada within NAFTA); ii) Chilean

SMEs export more, in relative terms, to MERCOSUR and Andean Community countries; and iii) Colombian SMEs export more to Venezuela and México (See Annex Table 4).

A lesser export-orientation of Latin American SMEs than of Asian counterparts has its roots in several barriers in external markets that they face, namely: i) weakness in their firms' quality management, information management, marketing strategy, customer management, and so on; ii) lack of human capital and access to credit; iii) small production capacity insufficient to achieve economies of scale; iv) lack of access to information relating to markets, regulations, technical norms, and so forth in foreign countries; and v) high freight costs and complexity and slowness of trade-related procedures (Angelilli et. al. 2006, Kuwayama, Ueki and Tsuji 2005). It is not always necessary for SMEs to export; if they become integrated part of production chains operated by large firms or of member of clusters that are highly export-oriented, they are in fact indirectly exporting. In this regard, what is needed is the promotion of backward and forward linkages, not only in manufacturing but also natural–resource based industries.

IV. Global Trends in Market-Oriented Knowledge Intensive Service Industries

A. Services as a key for international competitiveness

The service sector has been growing faster than the manufacturing sector for at least last two decades, and at present accounts for more than two-thirds of the world output. Within this sector, the most dynamic have been the so-called "Market-oriented Knowledge Intensive" (MOKI) services, constituted by three industries, —communication, financial and business services—; the combined worldwide gross revenue generated by these sectors more than doubled from US$ 4.5 trillion in 1985 to US$ 11.5 trillion in 2005, in terms of 2000 constant dollars (US Science Board, 2008). The value-added of these three sectors, calculated at 2000 constant dollars, grew at 4.4% annually during 1996-2005, led by the 7.4% growth of communications, followed by 4.0% and 3.9% of business and financial services respectively (Table 10 and Annex Table 5). As a result, compared with Education and Health, two knowledge-intensive but non-market-oriented service industries, each share of the three industries in world service value-added has consistently increased accounting together for roughly 70% of world total in 2005. In particular, business services represent almost half of that total (Figure 14).[10]

[10] OECD defines business services to include "computer and related services", "research and development" and "other business services" (ISIC rev. 3 categories 72, 73 and 74). Business services can also be sub-divided in two groups: the first subgroup is knowledge-intensive business services, which are professional services, including IT-consulting (72), R&D services (73), legal (74),

The United States, the European Union (20),[11] and Asia have been the leading producers of MOKI services representing close to 87% of world value-added activity during 1996-2005 (Table 10). Among the three blocks, the United States has been the dominant provider of these services accounting for 41% of world MOKI value-added, followed by the European Union and Asia with a respective share of almost 25% and 21%. Asia, the third largest provider of MOKI services, shows a steady rise in world value-added during the same period, compared with its share 18% during 1985-1995(Annex Table 5). In this region, China, and to a lesser extent, India, have been mainly responsible for this increase. In each of the three MOKI categories, Asia has gained inroads in world shares; its share in communication services approaches that of the European Union while in the case of financial services the former's share has surpassed the corresponding figure of the latter.

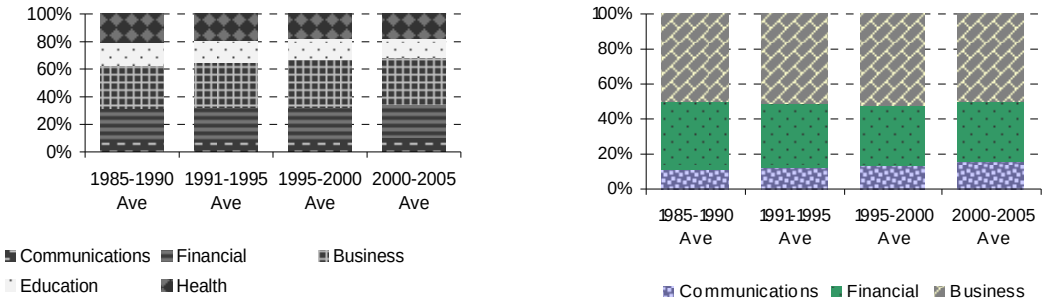
Despite certain dynamism of the services sector in Latin America and the Caribbean, the growth rates of value-added for market-oriented services of five Latin American countries analyzed here (Argentina, Brazil, Costa Rica, Chile and Mexico) who are estimated to contribute together almost 80% of the region's total service value-added, has been below par when compared with those of world and other regions, except for 1991-1995 (Annex Table 5). These Latin American countries score relatively better in financial services but poorly in communication services. Their average share for the three market-oriented services during 2001-2005 reached 3.5%, below the share of China including Hong Kong SAR with 4.2% of world value-added of the three sectors. Developing Asia contributed 8.7% of the total, while ASEAN (5) alone did the same with a 1.3% share.

The performance of the five Latin American countries does not either fare well over the last decade (Table 10), with its share not reaching a 5% threshold in each category. Developing Asia, China, India and ASEAN (5) in particular, recorded much higher rates and as a result increased their share in each category. The financial sector even experienced a negative growth during 1996-2005. In business services which have been the most dynamic sector worldwide, the five Latin American countries contributed on average only 4.0% of world total value added.

FIGURE 14

SHARE OF MARKET-ORIENTED AND NON MARKET-ORIENTED KNOWLEDGE-INTENSIVE SERVICE INDUSTRIES, 1985-2005

(In Million 2000 constant US dollars)



Source: US Science and Engineering Indicators 2008.

Notes: Knowledge-intensive services classified by Organisation for Economic Co-operation and Development (OECD) include business, financial, communications, education, and health services. Market-oriented knowledge-intensive services exclude education and health services. Value-added revenue excludes purchases of domestic and imported materials and inputs. EU excludes Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, and Slovenia. China includes Hong Kong. Constant dollar data for foreign countries calculated by deflating industry data valued in each country's nominal domestic currency with a sector-specific price index constructed for that country and then converted to U.S. dollars based on average annual exchange rates.

accounting (74), marketing and advertising (74), business consulting and human resource development (74). The second subgroup consists of operational services, including industrial cleaning (74), security services (74) and secretarial services (74).

[11] The European Union in this analysis excludes Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, and Slovenia.

TABLE 10
VALUE ADDED GROWTHS OF AND SHARES IN MARKET-ORIENTED SERVICES, BY SECTOR AND ECONOMIES/REGIONS 1996-2005 AVERAGES
(In Constant 2000 Million US Dollars and percentages)

	All market-oriented servicies			Communication Services		Financial Services		Business Services	
	Million US dollars	Growth Rates	Share in total	Growth Rates	Share in total	Growth Rates	Share in total	Growth Rates	Share in total
United States	23 082 882	4.3	40.7	6.3	39.5	4.2	38.4	3.8	42.7
EU	14 375 935	4.0	25.4	7.1	23.2	1.7	20.5	4.4	29.2
Asia	12 038 613	5.4	21.2	11.4	20.3	5.0	28.2	3.9	17.0
China	196 887	13.5	3.5	19.8	4.9	12.4	6.1	11.1	1.3
India	52 305	9.9	0.9	20.6	1.1	6.3	1.2	9.4	0.7
Japan	759 545	3.2	13.4	7.1	9.7	2.7	15.7	2.9	13.0
Korea, Respublic of	75 169	4.3	1.3	10.2	1.6	3.7	2.0	2.3	0.8
Taiwan Province of China	47 956	5.9	0.8	12.3	0.9	4.9	1.7	5.1	0.3
ASEAN(5)	71 999	4.9	1.3	8.4	2.1	2.5	1.4	5.4	0.9
Indonesia	14 756	6.1	0.3	10.9	0.6	1.6	0.2	5.8	0.2
Malaysia	13 750	8.0	0.2	9.4	0.3	8.7	0.2	6.9	0.2
Philippines	8 999	8.8	0.2	17.9	0.3	3.6	0.2	8.8	0.1
Singapore	25 254	4.1	0.4	4.2	0.6	4.7	0.5	3.3	0.3
Thailand	9 240	-1.2	0.2	3.9	0.3	-4.0	0.3	3.2	0.1
Latin America (5)	211 736	2.5	3.7	5.8	0.8	2.1	3.3	1.3	4.0
Argentina	40 396	1.4	0.7	6.4	1.7	-1.3	0.5	1.0	0.8
Brazil	102 534	0.9	1.8	10.0	0.2	0.7	1.9	-0.5	1.8
Chile	11 833	4.7	0.2	9.4	0.1	4.5	0.2	3.7	0.2
Costa Rica	2 185	7.6	0.0	10.4	1.1	6.2	0.0	7.3	0.0
Mexico	54 789	5.8	1.0	7.6	3.9	7.2	0.7	3.9	1.1
All others	504 024	5.3	8.9	5.4	16.0	5.6	9.6	5.0	7.2
World	**56 655 034**	**4.4**	**100.0**	**7.4**	**100.0**	**3.9**	**100.0**	**4.0**	**100.0**

Source: :Author's calculation based on US Science and Engineering Indicators 2008.

The relative backwardness of the region in the service sector has important implications for its integration into the global economy. In addition to being an important, if not the most important, component of the national output for the majority of the countries in the region, services are crucial to other industrial production and components for improving efficiency, productivity and international competiveness; efficiency in financial and banking services, professional services such as legal and accounting services, customs and port procedures and other trade facilitation measures, for example, are key elements of international competitiveness. Furthermore, competitive service export sectors are likely to emerge from a solid internal base of the same industry.

B. Export growth in Trade in Services

The growth rate of service exports from Latin America and the Caribbean in the last two decades was lower than that of Asia and the world as a whole. Over the course of this period, service exports multiplied by 4.5 in Latin America and the Caribbean, 6.2 worldwide, 8 in ASEAN countries and the Hong Kong Special Administrative Region (SAR) of China, 14 in India and 24 in China. Consequently, the Latin American and Caribbean share of the world service trade fell as that of Asia rose. The growth rate of the "Other services" category surpassed that of transportation and travel in those two regions and the world. Different growth rates led to a profound change in the share of trade captured by those three categories. Transactions in the "Other services" category, which are the focus of this section, increased considerably throughout the world. While the volume of this type of services also increased in Latin America and the Caribbean, particularly between 1985 and 1995, it continued to lag far behind Asia and the world as a whole (ECLAC 2007a, 2008b).

The lower dynamism of Latin America for the last two decades conceals a great deal of intraregional diversity. Guatemala, Chile and Costa Rica displayed the highest growth rates for services in general, while the Bolivarian Republic of Venezuela, Colombia and Ecuador posted the lowest rates in this category. The greatest expansion in transportation services took place in Panama and Chile. The latter became the chief

exporter of such services in the region. The strongest growth in tourism services was recorded in Guatemala, Brazil and Cuba, with annual rates exceeding 20%. Finally, Brazil, Argentina and Costa Rica posted the highest growth rates in the "other services" category. This category captured its largest share of overall exports in 2005 in Paraguay, Brazil and Argentina (ECLAC 2007a, 2008b).

This intraregional diversity led to significant shifts in the shares of each country and subregion in the service trade during this period. While Mexico remains the region's largest exporter, its share dropped by seven percentage points during the period in question. The Caribbean Community (CARICOM) and the Andean Community also lost ground. Conversely, service exports from "other countries" (particularly Chile) and Brazil increased considerably. The good performance of Brazil can be attributed mainly to its buoyancy in the "other services" sub-category, where its share rose from 15% to 38%. The Andean Community and Mexico were the biggest losers in this regard. The latter maintained its position only thanks to the good performance of its tourism services sector (ECLAC 2007a, 2008b).

As can be observed from Table 11, China, India, Japan and ASEAN (10) countries as a whole reported a higher share of "Other Services" among the three principal sectors of service exports for the period 2001-2006. The sector accounts for roughly 40% of total service exports for China and ASEAN while it represents 75% and 57% of total exports of India and Japan, respectively. The Asian performance in this sector compares quite favourably with that of Latin American groupings except for that of Mercosur in which Brazil weights heavily. Growth rates for "Other services" have been sluggish, with the case of Mexico reporting a negative rate.

Among the all MOKI services —excluding personal and cultural and recreational services and government— related services, gains by Asian countries raised the relative importance of subsectors such as computer and information, royalties and licence fees and insurance and financial services within the subsector of "Other Services". In general, the progress by Latin American countries in these areas have been insufficient, though Andean countries, Chile, and Central American Common Market economies have been able to make some inroads in the areas of computer and information and royalties and licence fees.

TABLE 11

EXPORTS IN TRADE IN SERVICES, COMPOSITION AND GROWTH, BY SECTOR, 2001-2006

(In percentages)

	China		India		Japan		ASEAN		Mexico		Chile		Andean Countries		MERCOSUR		CACM	
	Share	Growth	Share	Growth	Share	Growth	Share	Growth	Share	Growth	Share	Growth	Share	Growth	Share	Growth	Share	Growth
All sectors	**100.0**	20.2	**100.0**	28.6	**100.0**	9.2	**100.0**	11.3	**100.0**	3.0	**100.0**	10.7	**100.0**	7.1	**100.0**	10.2	**100.0**	9.1
Transportation	19.2	33.7	11.0	25.2	33.8	6.6	28.3	10.7	10.1	5.7	57.0	12.6	26.5	6.8	19.1	10.3	14.4	4.4
Travel	41.5	13.1	14.5	17.1	9.0	16.6	32.7	7.4	72.5	6.6	17.6	6.8	49.6	8.0	29.7	7.1	58.6	10.2
Other services	39.4	23.3	74.5	31.7	57.2	10.0	39.0	15.5	17.3	-9.1	25.4	9.2	24.0	5.6	51.2	12.1	27.0	9.3
All sub-sectors of Other Services	**100.0**	23.3	**100.0**	31.7	**100.0**	10.0	**100.0**	15.5	**100.0**	-9.1	**100.0**	9.2	**100.0**	5.6	**100.0**	12.1	**100.0**	9.3
Communications	*2.3*	-9.5	*4.7*	24.1	*1.1*	-10.0	*5.9*	20.5	*21.8*	-14.7	*9.5*	-8.0	*27.5*	3.6	*4.7*	13.0	*22.2*	5.2
Construction	*7.4*	28.8	*1.5*	-3.6	*12.1*	7.4	*4.5*	22.1	*0.0*	--	*0.0*	--	*0.0*	--	*0.4*	-24.7	*2.7*	28.7
Insurance	*1.6*	31.1	*2.3*	27.7	*1.1*	44.3	*4.4*	17.1	*50.5*	-5.7	*9.1*	13.9	*8.6*	-1.3	*2.0*	-1.1	*7.4*	4.1
Financial Services	*0.5*	11.0	*3.0*	39.9	*8.2*	13.6	*7.3*	17.2	*0.0*	--	*2.2*	-0.1	*3.4*	-3.0	*5.2*	10.3	*1.5*	15.1
Computer and information	*6.3*	42.3	*55.8*	35.4	*2.2*	-7.8	*2.5*	23.2	*0.0*	--	*4.6*	13.6	*1.5*	25.3	*3.1*	18.8	*14.6*	31.8
Royalties and licence fees	*0.7*	16.8	*0.2*	5.2	*28.4*	11.9	*1.5*	38.0	*3.4*	25.8	*3.1*	32.9	*0.6*	11.9	*3.6*	3.9	*0.1*	-21.9
Other business services	*79.0*	24.8	*31.0*	33.2	*43.1*	9.6	*68.0*	13.6	*5.1*	-100.0	*61.8*	12.0	*30.6*	13.7	*67.7*	13.2	*33.5*	7.9
Personal and cultural and recreational services	*0.3*	51.6	*0.2*	--	*0.3*	3.2	*4.1*	59.7	*14.5*	2.6	*3.9*	23.9	*4.6*	5.0	*1.9*	24.1	*0.0*	-20.6
Government services n.i.e.	*1.9*	12.6	*1.2*	-12.3	*3.4*	15.0	*1.8*	9.7	*4.7*	-31.0	*5.7*	1.7	*23.1*	1.2	*11.3*	15.1	*18.0*	3.8

Source: ECLAC calculations based on the UNCTAD database.

Notes: Andean countries include Bolivia (Plur. State of), Colombia, Ecuador, Peru and Venezuela (Bol. Rep. of).

ASEAN includes its 10 member countries. Other business services include Merchanting and other trade-related services, Operating leasing services, and Miscellaneous business, professional and technical services including legal services , accounting, auditing, consulting, advertising, research and development, waste management and decontamination.

In sum, although Latin America and the Caribbean have been less successful than the Asian counterparts, especially India and China, in capturing segments of the growing international demand for high-quality services, the region does have great potential to reverse that trend. Its advantages include an ever-larger pool of skilled labour with fairly competitive pay levels, a good-quality technological infrastructure and cultural similarities with the Western countries. The region is also in the same time zone as its largest importer of such services, the United States, and benefits from geographical proximity.

ECLAC recommendations on the promotion of services production and exports are three-fold. First of all, in order for the region to derive greater advantage from the opportunities offered by trade in services, its public and private sectors need to make a determined effort to produce better-quality, competitively priced services. These efforts should target the main obstacles to the sector's development. Second, upgrading human capital is probably the most important task for Latin America and the Caribbean in this sphere. Third, an important step in opening up access to modern technologies such as telecommunications is to improve regulatory and competition policy with a view to stimulating investment and ensuring that high-quality services are provided at the lowest possible cost (ECLAC 2008b).

V. Natural Resources as a Motor of Value-Added and Knowledge Creation

While it is far beyond the scope of this paper to analyze in detail the relationship between natural resource endowment and economic growth from the regional perspective, it is still useful to address the issue from the viewpoint of export specialization, value aggregation and technology absorption.

The arguments in favour for industrialization based on manufacturing activities, instead of natural-resources, relate to the often mistaken assumptions that raw materials are basically produced by developing countries, while manufacturing products are produced by developed countries; raw material industries entail limited developments of forward and backward linkages; industrialization, particularly the development of manufacturing activities, offers the greatest scope for productivity growth; there are little learning effects from investment and/or trade in natural resources, while manufacturing provides a large potential for the division of labour; raw material industries offer little scope for technological progress, while manufacturing does; and prices of commodities are determined exogenously rather than endogenously and are subject to low-income elasticity, high price volatility and long-term price deterioration, conversely to manufacturing products. In addition, the presence of input suppliers' networks in manufacturing is considered to widen the scope of technical progress as well as to impact on the overall economy by generating externalities and employment.

Recent literature on growth and trade suggests that countries can

and do create new comparative advantages through polices that build new endowments. This validates the predictions of new trade theories. "New endowments, such as human capital, knowledge, and good institutions and public infrastructure, explain as much, if not more, of the comparative advantages of countries and their evolution overtime, as traditional factor endowments such as land, labor, and physical capital. Productivity growth in agriculture has outpaced that of manufacturing in both developed and developing countries.[12] Blomström and Kokko (2001) argue that forestry will remain a dynamic sector in Sweden and Finland through its high productivity growth. Wright (2001) draws on the early experiences of the United States and Australia to demonstrate that the stock of minerals is, to a large extent, endogenous, and major increases in productivity can be realized in discovery and exploitation. Lederman and Maloney (2003) conclude that contrary to much of the recent literature, natural resource abundance appears to have a positive effect on growth, whereas concentration hampers growth; it is concentration per se, and not in natural resource in particular that is negatively correlated with growth. Productivity growth in agriculture in Latin America, for instance, has increased significantly after trade reform, though in many countries there was an initial period of decrease.

Natural resource sectors can and do create linkages with domestically manufactured intermediate goods. Good examples of backward and forward linkages can be observed in Finland and Sweden, two economies that originally provided inputs for the production of forest products. Similar linkages are increasingly present in various Latin American and Caribbean economies, where mining or agricultural products buy/sell inputs, and hire/supply services to and from other local engineering services. It should be noted, however, that low transport costs have reduced the profitability of these types of linkages by fragmenting the stages of production, with raw materials now increasingly exported for manufacturing to countries that have the know-how, the capital and other factors needed to most efficiently produce the final products.

All this suggests that natural resource-based activities can have high productivity growth, technical spillovers, and forward and backward linkages, as much as modern manufacturing. Such activities can become knowledge industries (De Ferrant; et. al 2002). The recent success of Chile, with the highest growth rate in the region in the last 25 years, has been almost fully led by exports of natural resource-based products. Fresh-fruit production and marketing in Chile has a high technological content. In principal, high-tech products do not have to belong to a high-tech industry. Some production processes in low-tech industries can be highly knowledge and R&D intensive.

It is often assumed that manufactured goods have a high income elasticity, while that for primary products is low; this stems from the second assumption that the presence of forward and backward linkages and product differentiation in manufactured goods in which "non-price" factors including quality, brands or other characteristics play an important role, unlike primary products which are thought to be generally standardized and whose demand is inelastic to income gains. As a result, labour productivity, which is considered as the determinant factor of international competitiveness, improves for manufacture goods as compared to primary products.

However, the changing production and trade patterns not only in manufactures but also primary products are modifying substantially these dichotomized assumptions (Iizuka 2007). In fact, primary products can be highly differentiated. Analyzing Latin American export specialization in resource-based products, Batista (2004) concludes that exports of differentiated products tend to be much more dynamic than of homogenous primary products. Some Chilean exports of primary and agro-industrial products, for example, are considered as highly differentiated, while most of Brazilian exports of primary and agro-industrial products can be classified as homogenous goods.

[12] Martin and Mitra (2001) show that during 1967 and 1992, not only was TPF growth 50% faster in agriculture than in manufactures, but the industrialized countries experienced rates substantially above those of less developed countries. In fact, several of the big natural resource success stories —Denmark, France and Sweden— continue to show the highest TFP growth rates in agriculture. LAC agriculture confirmed that agricultural productivity increased in all countries after trade reforms. The most successful case in terms of output per worker and export growth during 1980-99 in agriculture was Chile (World Bank 2003).

There are increasingly greater scope of product differentiation and linkage generation for primary products. The prevalent arguments in favor of manufactures, especially from the viewpoint of intra-industry trade (IIT), can be applied to natural resource sectors as well: i) product differentiation, in which firms across borders produce similar products that are distinguished from one another by band or by other subtle difference; ii) increasing returns to scale and productivity gains. This pattern of trade can emerge when industries benefit from either large initial investments or fixed costs, or when producers become more efficient through experience or through the introduction of technological innovations from abroad or from nearby industries; and iii) agglomeration, or clustering; the production of one type of final good leads to the development of new manufacturing/processing processes as a consequence of learning spillovers. Meanwhile, natural resources-based industries rely heavily on advancements in basic and applied science which are often carried out by transnational firms and not easily appropriated as public goods. This calls for participation of public research institutes and universities, possibly with collaboration with producers (farmers, breeders, etc.) (Pietrobelli and Rabellotti 2004).

For many countries of Latin America and the Caribbean, the agro-industrial complex has an enormous potential to become highly competitive, and technology learning processes could open up possibilities for carrying out more complex production activities in the future. As the experience of several of today's developed countries shows, there are also huge opportunities for developing backward linkages in the generation of farm inputs (machinery, seeds, agrochemicals, technical assistance) through connections with industries using cutting-edge technology. The transition towards producing goods with greater value added does not necessarily entail increasing the level of industrial processing (Kuwayama and Durán 2003), but it does require a higher knowledge and innovation content, not only in production processes but also in logistics and marketing. In mining as well, there are ample opportunities in carrying out more high-tech mineral and metallurgical exploration and mining activities, such as remote sensing by satellite, geophysical drilling, data processing and deposit imaging, using more sophisticated drilling equipment, solvent extraction and bioleaching (ECLAC 2008).

VI. Some Policy Implications

The recent industrial and trade performance of Latin America and the Caribbean, as compared to that of East and Southeast Asian countries and some emerging European countries, has been relatively weak. In general, Both in trade and industrialization, countries in the region are underperforming relative to other developing regions and to its potential. When measured in terms of MVA per capita, Latin America and the Caribbean is the most industrialized developing region and has a long history of industrialization. Moreover, some countries have developed large domestic markets for manufactures and have increased market access to major trading partners for these products. The region is also endowed with natural-resources for its industrial deepening and processing for exports. It is, however, lagging in some of drivers with respect to the mature Asian countries in this respect especially the low quality of human resources and low levels of R&D capabilities and inadequate institutions in charge of industrial and trade development.

The issue of export dynamism is almost always analyzed in gross export values, not in value-added terms.[13] Value-added tends to be much lower particularly where developing countries are involved either in low-skill, low-value added assembly stages of global production networks, as in electronics and apparels, or in natural resource-based sectors and some segments of services. For example, in the case of Mexico and Central

[13] This calls for a note of caution on interpretation of trade statistics: trade statistics based on customs records do not record the level of value-added by local manufacturing processes. International production networks promote a new pattern of trade, in that the total value of trade recorded for products that cross national boundaries several times exceeds their value added by a considerable margin. Consequently, trade in such products can grow without a commensurate increase in their final consumption as production networks are extended across borders.

American manufacturing, manufactured imports and exports exceed value added by a large margin, but in this sub-region, exports have high direct import contents due to their close involvement in international production networks. The theoretically rigorous measure of comparative advantage is net exports.

Moreover, the export values of the most market-dynamic products from the electronics industry have been subject to a higher price and volume volatility in developing countries than in the industrialized countries. And this volatility for developing countries has increased markedly in recent years. Nowadays, not only primary commodities but also high-tech manufactured exports are increasingly subject to price fluctuations and volatilities in export earnings. In this regard, some high-tech manufactures suffer from the major features of "commodities", that is to say, price volatility and long-term price declines.

As some East Asian and Latin American and the Caribbean experiences demonstrate, participation in the labor-intensive segments of international production networks can yield benefits for countries in the early stages of industrialization and with surplus labor. Large employment opportunities for low-skilled labor can be obtained by focusing or mastering a limited sub-set of all the activities involved in making a final product. However, the participation in the internationally integrated production systems that produce high-tech goods is not synonymous to the participation in high-technology production processes.

The participation in the labor-intensive segments of international production chains neither automatically brings about technological upgrading and productivity growth as well as the technological spillovers needed to move up in the production chain, as is envisaged by the so-called "flying-geese" pattern of industrial transformation overtime among the countries and industries. Going up the technology ladder is especially difficult when the local suppliers' base is not well developed, or when the foreign-owned manufacturers, rather than national firms, are the major suppliers of the most sophisticated key components and services. In these cases, design and engineering services and research and development activities as well as marketing logistics tend to be more concentrated in the parent companies of transnational corporations (TNCs).

To a different degree, the governments and businesses in the Latin America and the Caribbean region have taken advantage of opportunities that have been opened by globalization and by the strategies of TNCs, based primarily on existing comparative advantages. Nonetheless, with a high propensity of importation of goods and services, coupled with the lack of adequate policies and infrastructures, the integration of enterprises and productive sectors in the region to global production networks has not been as thriving as in other parts of the world. The degree of articulation with the local productive apparatus has been unsatisfactory, at the detriment of the development of national suppliers and endogenous technology capabilities. On the contrary, the "opening-up" process, together with higher import contents, has tended to reduce linkages that existed prior to trade liberalization.

Developing countries, except some East Asian countries which have managed to achieve income levels similar to those in the developed world, have based their export baskets mainly on the use of natural resources or unskilled labour. Making the transition from commodities to manufactures does not necessarily guarantee progress towards high–technology activities. On the contrary, the production of some commodities may require more intensive use of skilled labour and, at the same time, create more linkages with the rest of the economy than, for example, the production of manufactures based on assembly activities.

The Latin American and Caribbean countries can and do create new comparative advantages through policies for building new endowments such as human capital, knowledge, better institutions and physical infrastructure, in addition to the traditional factors of production such as land, labour and physical capital. A particular facet of the development of production linkages is the formation of clusters. The term "cluster" usually refers to a grouping –sectoral, geographical or both– of companies engaged in similar production processes or closely related activities, formed for the purpose of

generating significant and cumulative external economies of agglomeration and specialization, in addition to creating opportunities to carry out joint activities in pursuit of greater collective efficiency.

It is essential to encourage the formation of clusters and the incorporation of services with a high technological component, such as consulting services, engineering, design, advertising and research, among others, in order to add greater value to natural resource–based activities. At present, the inclusion of such services is vital for many subsectors, including mining, agro-industry and aquaculture. In this connection, another phenomenon being observed is the outsourcing of high–technology services to SMEs under various subcontracting arrangements and other types of business partnerships, instead of their internalization within the company.

The production system should be visualized as a series of national networks in which there are linkages between firms and within and between sectors. These networks and their impact on the endogenous transformation of a country's productive development are crucial, as a small qualitative change in the right direction can make a huge difference in the speed with which a country accumulates technological capacity in relation to the developed countries. For this reason, it is imperative to increase the countries' systemic competitiveness as a prerequisite for steering the production system in the right direction. Competitiveness is determined by the features of these linkages between firms and within and between sectors in the wider production chain, and is based on the efficiency of firms and on the existence of a competitive network of research and development units, suppliers, producers, distributors, wholesalers, retailers and service centres. To speed up and intensify the accumulation of physical and human capital, countries must take measures that have a simultaneous impact on all these components, applying not only neutral and horizontal policies (that is, policies that are not exclusively aimed at a particular sector), but also selective policies that have a lasting effect on systemic competitiveness.

From this standpoint, policies for creating linkages are essential and require the implementation of a number of measures, such as the following: i) promoting the formation of production networks and clusters involving a broad range of firms (TNCs, large domestic firms and SMEs), both in manufacturing sectors and in natural resource and service sectors, with a focus on systemic competitiveness; ii) encouraging the emergence and incorporation of technology–intensive services to support the production process; iii) fostering the creation of business partnerships (such as joint ventures, outsourcing, licensing and franchising) that tend to build endogenous capacity for developing technology and know–how; iv) promoting SMEs and their involvement in export activities and the generation of knowledge; (v) encouraging the use of ICTs as a tool for export promotion, both in the natural resource, industrial commodity and handicraft sectors and in commercial services (consulting, engineering, tourism, data processing); vi) strengthening local linkages in the maquila sector and incorporating the necessary productive and technological capacities to manufacture products with higher value added; and vii) strengthening innovation systems under the policy for creating linkages in order to develop technologies with more local content by creating and consolidating linkages between sectors, institutions, firms and academic and research centres. It should be reminded that it is not simply a matter of increasing research and development (R&D) spending while maintaining current policies as they are; instead, these policies need to be reshaped so that they are consistent with the requirements of the new development strategy and sectoral priorities given by that strategy.

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Annex

TABLE A.1
EVOLUTION OF VALUE ADDED IN MANUFACTURING AND OTHER SECTORS: LATIN AMERICA AND EAST ASIA

Indicator	Year/Period	Argentina	Brasil	Paraguay	Uruguay	Rep. Bol. of Venezuela	Plur. State of Bolivia	Colombia	Ecuador	Peru	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Dominican Republic	Panama	Chile	Mexico	Jamaica	Trinidad and Tobago	Latin America and Caribbean
MVA, average annual real growth rate (in %)	1995-2000	0.9	0.2	0.0	0.2	6.0	2.7	-0.6	1.1	1.1	9.6	5.2	2.7	4.3	4.9	6.3	0.3	1.5	7.6	-2.9	9.9	3.0
	2000-2006	5.3	2.6	1.0	4.3	4.0	3.3	4.7	4.2	5.2	3.4	2.0	1.7	4.4	4.4	1.4	0.0	3.9	1.3	-0.1	6.6	2.8
Non-manufacturing GDP,average annual real growth rate (in %)	1995-2000	3.0	2.4	0.1	2.6	-0.5	3.6	0.9	0.6	2.6	4.6	2.7	4.3	2.5	5.0	8.2	5.6	4.4	4.9	0.4	4.7	3.2
	2000-2006	3.3	2.4	3.2	1.9	3.0	3.3	3.9	5.2	4.8	5.2	2.1	2.9	3.8	3.0	4.4	5.4	4.3	2.6	2.1	8.5	3.0
MVA per capita, in constant 2000 US$	1995	1287	873	227	1073	769	129	313	184	298	725	423	225	145	104	318	421	846	807	475	300	680
	2000	1264	858	200	1044	894	134	290	175	296	936	488	222	157	117	397	373	871	1084	395	446	739
	2006	1520	941	182	1219	1047	144	348	202	362	946	506	212	179	131	396	337	996	1085	368	642	793
MVA as percentage of GDP at constant 2000 prices	1995	17.9	21.5	15.3	18.6	14.9	13.7	15.1	13.8	15.1	20.1	21.2	14.1	15.9	15.0	18.0	12.1	19.6	16.5	14.6	5.9	18.6
	2000	16.5	20.0	15.5	16.9	18.5	13.2	14.6	13.6	14.4	23.1	23.1	13.2	17.0	15.1	16.8	9.5	17.6	18.4	12.7	7.1	18.6
	2006	17.8	19.8	13.7	18.4	19.6	13.1	15.2	12.9	14.6	19.8	23.3	12.3	17.7	16.1	13.9	7.2	17.2	17.5	11.2	6.5	18.3

Indicator	Year/Period	China	China (Taiwan Province)	China (Hong Kong SAR)	India	Republic of Korea	Indonesia	Malaysia	Philippines	Singapore	Thailand	Viet Nam	Cambodia	Lao P.D.R.	Pakistan	Sri Lanka	Japan	Australia	New Zealand	South and East Asia and Oceania Developing countries	Industrialized Countries
MVA, average annual real growth rate (in %)	1995-2000	9.3	5.6	-4.7	4.4	6.8	1.3	6.0	2.6	6.2	1.7	11.0	20.6	9.7	3.4	7.0	0.4	2.0	0.7	6.6	5.3	3.2
	2000-2006	11.2	5.9	-4.7	7.7	7.3	5.4	6.0	4.4	5.6	7.2	11.4	14.3	10.1	9.4	2.8	1.5	1.2	2.3	8.8	7.0	1.8
Non-manufacturing GDP,average annual real growth rate (in %)	1995-2000	8.1	5.8	3.1	6.1	2.4	-1.4	2.7	3.7	5.5	-1.8	5.9	5.7	5.4	3.0	4.8	0.6	4.4	2.8	4.8	4.0	2.9
	2000-2006	9.1	3.2	5.3	7.4	3.6	4.7	4.7	4.8	3.9	4.3	6.4	8.4	5.3	4.6	4.6	1.7	3.4	3.5	6.4	5.1	2.4
MVA per capita, in constant 2000 US$	1995	204	2700	1682	55	2027	203	971	210	4961	623	47	20	38	69	103	7743	2307	2181	201	239	2957
	2000	307	3426	1276	65	2855	216	1280	221	5945	677	74	45	55	71	139	8130	2410	2181	265	293	3426
	2006	543	4420	883	92	4130	275	1547	255	6853	943	129	87	87	105	150	8383	2493	2410	399	394	3656
MVA as percentage of GDP at constant 2000 prices	1995	30.8	23.8	7.3	14.8	22.1	25.1	27.7	23.1	25.3	30.0	15.3	8.9	14.0	13.8	14.0	21.9	12.6	16.9	22.9	19.5	17.3
	2000	32.1	23.8	5.2	14.3	26.1	27.8	32.6	22.2	25.8	33.6	18.6	16.0	16.9	13.8	15.6	22.2	11.6	15.7	24.7	20.7	17.6
	2006	34.5	25.8	2.9	14.4	29.8	28.6	33.5	21.9	26.4	37.0	23.1	21.4	21.2	17.4	14.4	21.0	10.5	15.0	27.0	22.2	16.7

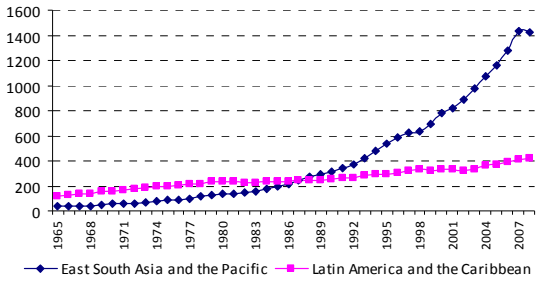
Note: East and Southeast Asia include: Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, China (Hong Kong SAR), China (Macao SAR), China (Taiwan Province), Cook Islands, Democratic People's Republic of Korea, Fiji, French Polynesia, Guam, India, Indonesia, Iran (Islamic Republic of), Kiribati, Lao People's Dem. Rep., Malaysia, Maldives, Marshall Islands, Micronesia, Federated States of, Mongolia, Myanmar. Nepal, New Caledonia, Pakistan, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Singapore, Solomon Islands, Sri Lanka, Thailand, Timor-Leste, Tonga, Tuvalu, Vanuatu, and Viet Nam.

FIGURE A. 1

VALUE-ADDED COMPARISION BETWEEN LATIN AMERICA AND THE CARIBBEAN AND EAST, SOUTH EAST AND THE PACIFIC, BY MAJOR SECTOR

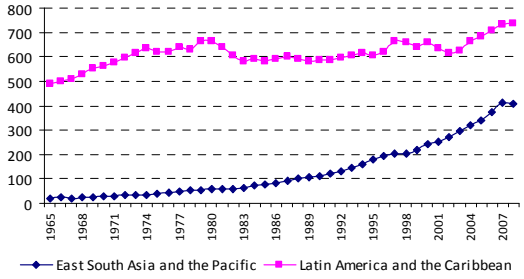
A: MVA 1965-2008

(Billions of Constant 2000 US Dollars)



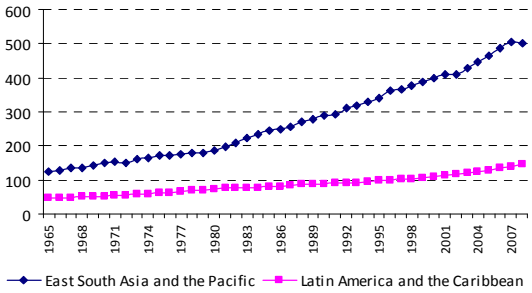
B: MVA Per Capita 1965-2008

(Constant 2000 US Dollars)



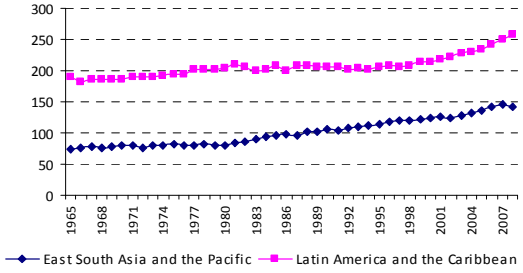
C: Agriculture Value Added 1965-2008

(Billions of Constant 2000 US Dollars)



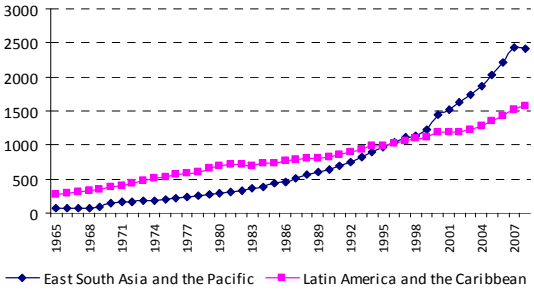
D: Agriculture Value Added Per Capita 1965-2008

(Constant 2000 US Dollars)



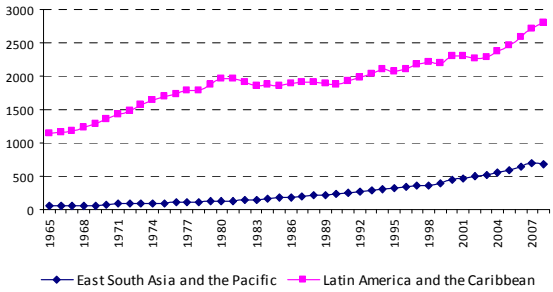
E: Services Value Added 1965-2008

(Billions of Constant 2000 US Dollars)



F: Services Value Added Per Capita 1965-2008

(Constant 2000 US Dollars)



Source: Calculated from Data provided by World Bank, World Economic Indicators.

Notes. East, South East Asia and South Asia excludes Australia, Japan and New Zealand and consists of 39 economies and countries; American Samoa, Brunei Darussalam, Cambodia, China, Fiji, French Polynesia, Guam, Hong Kong, China, Indonesia, Kiribati, Korea, Dem. Rep. , Korea, Rep., Lao PDR, Macao, China, Malaysia, Marshall Islands, Micronesia, Fed. Sts. Mongolia, Myanmar, New Caledonia, Northern Mariana Islands, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Thailand, Timor-Leste, Tonga, Vanuatu, Vietnam, Afghanistan, Bangladesh, Bhutan, India, Maldives. Nepal, Pakistan, Sri Lanka.

TABLE A. 2
VALUE ADDED GROWTH, BY PRINCIPAL ECONOMIC SECTORS, 1990-2005
MILLION OF DOLLARS AT CONSTANT 2000 PRICES
(Annual Growth %)

	Manufacturing	Agriculture Forestry	Mining	Services					
				Electricity Gas Water	Construction	Wholesale Retail	Transport Communications	Finance Insurance etc.	Community Social services
Antigua and Barbuda	0.8%	1.6%	3.3%	4.1%	5.8%	2.3%	4.6%	4.6%	3.2%
Argentina	2.6%	2.6%	3.8%	5.6%	5.3%	2.8%	5.7%	3.3%	2.1%
Bahamas	1.9%	0.5%	4.0%	4.0%	3.4%	0.7%	2.4%	4.7%	1.2%
Barbados	0.3%	-1.8%	0.7%	3.4%	3.4%	1.7%	1.9%	-	1.3%
Belize	3.5%	7.2%	4.4%	5.2%	2.3%	5.9%	7.7%	8.3%	3.4%
Bolivia (Plur. State of)	3.4%	3.2%	3.9%	5.0%	2.4%	3.0%	4.7%	4.7%	2.8%
Brazil	2.0%	3.4%	4.5%	3.6%	0.9%	2.3%	5.1%	1.3%	1.6%
Chile	4.2%	5.2%	6.0%	6.9%	4.8%	6.4%	8.0%	5.3%	3.3%
Colombia	1.6%	1.6%	4.1%	1.9%	2.7%	2.3%	3.6%	3.5%	5.2%
Costa Rica	5.5%	3.3%	2.5%	6.9%	2.3%	4.3%	9.2%	4.9%	2.8%
Cuba[b]	0.9%	-3.1%	7.8%	1.8%	-6.8%	-1.3%	0.8%	0.9%	1.6%
Dominica	0.3%	-1.3%	0.4%	4.4%	0.8%	3.1%	2.2%	2.3%	1.8%
Ecuador	1.4%	4.2%	4.9%	2.8%	2.4%	2.3%	4.3%	2.7%	1.7%
El Salvador	4.2%	1.3%	3.7%	0.1%	3.9%	4.4%	5.6%	3.1%	1.6%
Grenada	3.6%	-3.6%	6.8%	5.7%	9.4%	2.1%	5.8%	4.1%	-0.4%
Guatemala	2.3%	2.7%	8.1%	7.5%	1.6%	3.8%	6.5%	3.9%	3.0%
Guyana	2.8%	4.2%	2.1%	-	5.3%	3.1%	5.3%	3.1%	1.4%
Haiti	-3.5%	-1.2%	1.0%	-4.5%	-0.3%	1.1%	2.1%	0.8%	1.0%
Honduras	4.1%	2.6%	4.0%	5.8%	1.0%	3.5%	3.8%	4.9%	3.4%
Jamaica	1.4%	-0.5%	2.1%	3.4%	0.2%	0.7%	5.7%	3.1%	0.9%
Mexico	2.9%	1.7%	2.1%	3.4%	2.4%	3.0%	5.6%	4.0%	1.5%
Nicaragua	3.8%	3.9%	8.0%	4.1%	3.4%	3.8%	3.9%	4.2%	1.1%
Panama	1.3%	3.8%	17.2%	4.5%	15.1%	5.2%	6.8%	5.4%	2.2%
Paraguay	1.1%	3.4%	-0.7%	3.9%	-1.4%	1.4%	5.1%	1.0%	1.7%
Peru	3.9%	4.4%	6.8%	5.0%	5.4%	3.7%	4.4%	4.2%	2.6%
Dominican Republic	5.3%	3.2%	-1.4%	7.7%	3.7%	6.4%	11.1%	3.4%	3.8%
Saint Kitts and Nevis	3.4%	1.4%	1.9%	7.0%	4.1%	2.7%	5.8%	6.7%	2.6%
Saint Vincent and the Grenadines	0.3%	-2.6%	3.2%	6.3%	3.5%	6.1%	4.5%	4.1%	3.3%
Saint Lucia	1.1%	-7.2%	3.1%	6.2%	3.8%	2.2%	4.1%	5.8%	2.2%
Suriname	2.4%	0.6%	5.7%	2.2%	1.2%	1.3%	8.7%	1.6%	-0.4%
Trinidad and Tobago	4.3%	-0.7%	7.5%	6.0%	6.9%	4.8%	6.9%	6.9%	0.0%
Uruguay	0.2%	2.9%	5.4%	3.6%	1.0%	2.9%	6.3%	1.2%	0.8%
Venezuela (Bol. Rep. of)	1.5%	1.8%	3.0%	3.3%	2.0%	1.5%	2.9%	1.5%	2.1%
Latin America and the Caribbean[a]	2.4%	2.7%	4.0%	4.0%	2.2%	2.9%	5.4%	2.7%	1.9%
Latin America[a]	2.4%	2.8%	3.9%	4.0%	2.2%	2.9%	5.4%	2.7%	1.9%
Caribbean	0.8%	0.5%	6.8%	4.2%	3.2%	2.0%	5.1%	4.9%	1.0%

Source: Calculated by the Author using the ECLAC Statistical Yearbook 2006.

[a] Does not include Cuba.

[b] In the case of Cuba, only 1990-2003.

FIGURE A. 2
EVOLUTION OF HIGH TECH MANUFACTURING VA, HIGH TECH EXPORTS AND IMPORTS AND REVENUE, 1985-2005
(In Million Constant 2000 US Dollars)

Selected Asian Economies

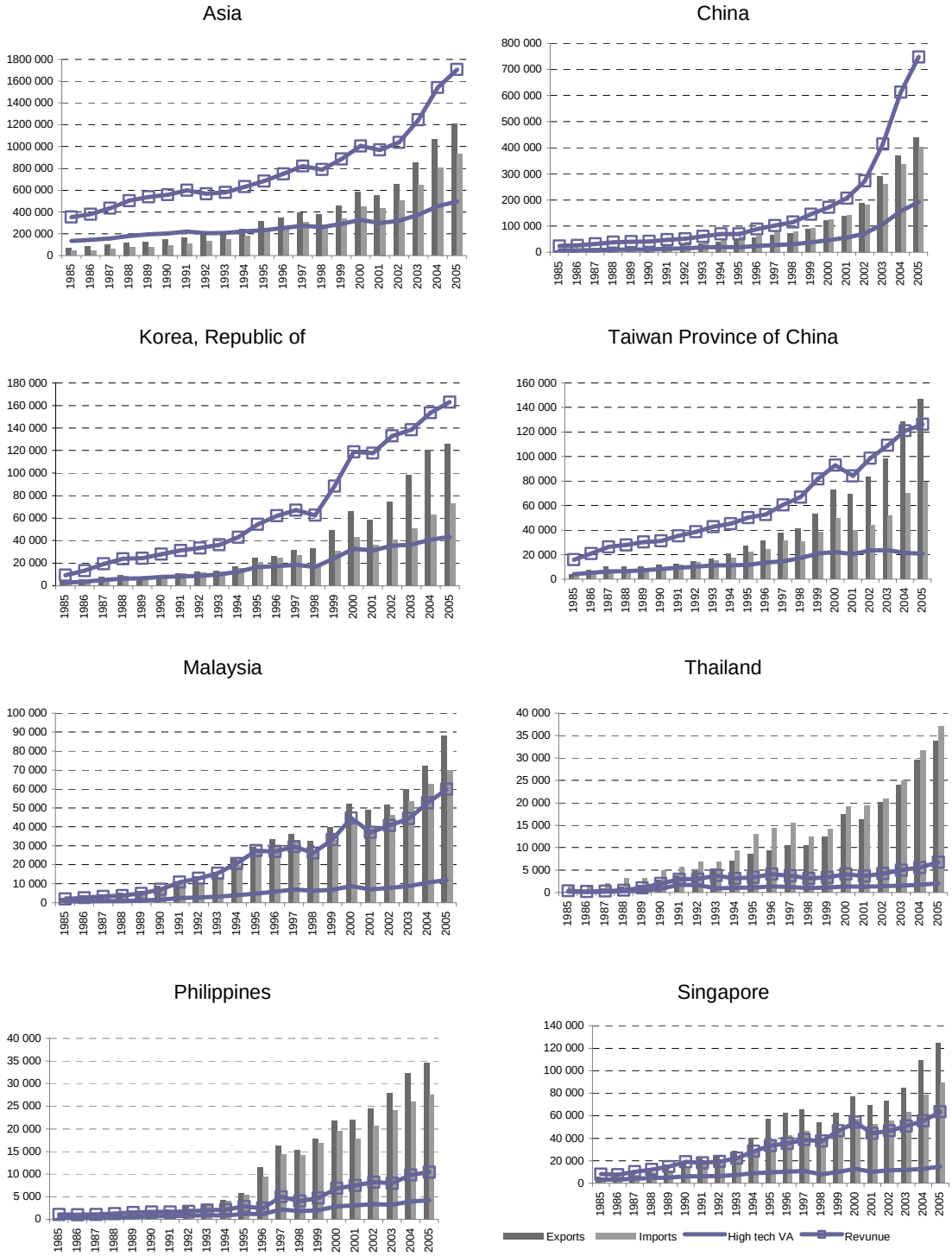
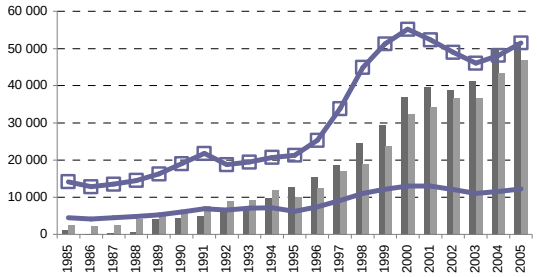


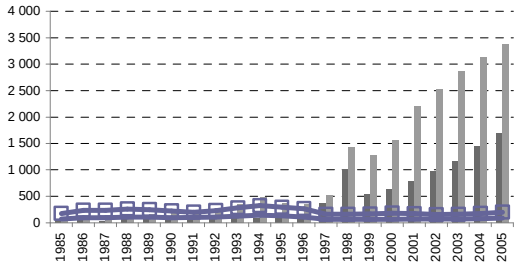
Figure A.2 (Continued)

Selected Latin American Countries

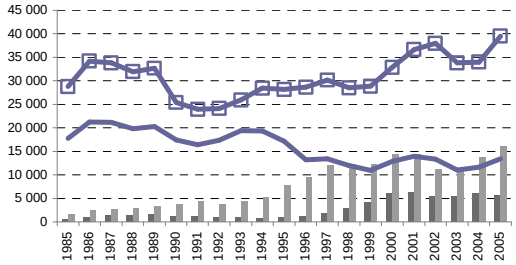
Mexico



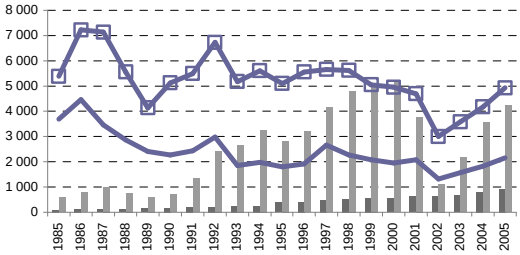
Costa Rica



Brazil



Argentina



Chile

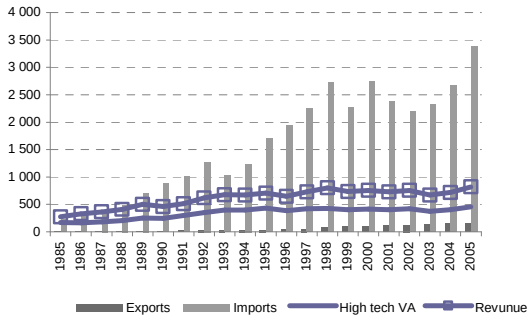
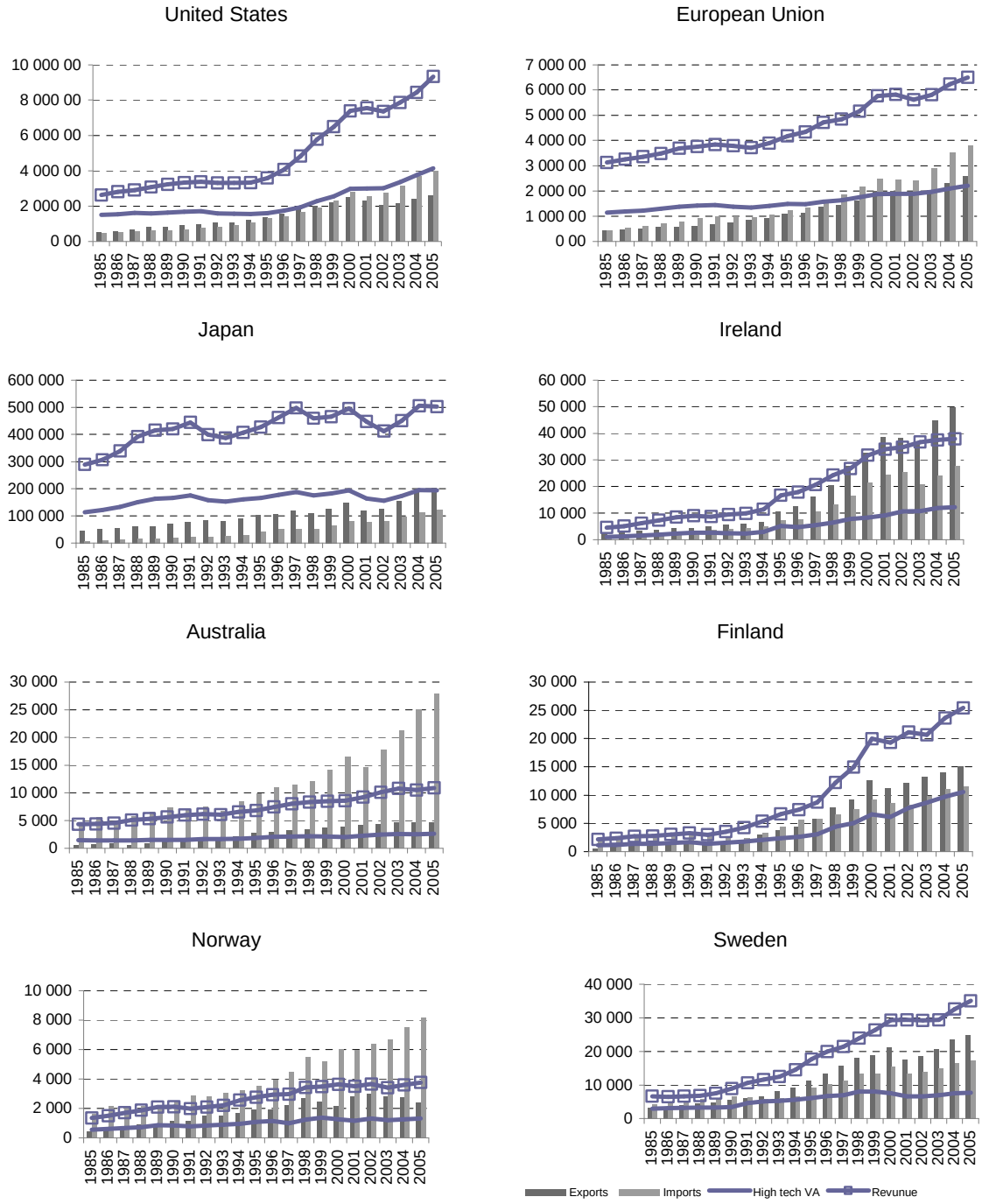


Figure A.2 (Concluded)

Selected Developed Countries/Regions



Source: ECLAC's calculation based on US Science and Engineering Indicators, 2008.

Notes: EU = European Union: excludes Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, and Slovenia. High-technology manufacturing industries classified by Organisation for Economic Co-operation and Development (OECD) and include aerospace, communications equipment, office machinery and computers, pharmaceuticals, and scientific instruments. Value-added revenue excludes purchases of domestic and imported materials and inputs. China includes Hong Kong. Constant dollar data for foreign countries calculated by deflating industry data valued in each country's nominal domestic currency with a sector-specific price index constructed for that country and then converted to U.S. dollars based on average annual exchange rates.

TABLE A. 3

BRAZIL AND KOREA, CONTRIBUTION OF MVA AND WAGE TO OUTPUT, 2005, BY INDUSTRY (ISIU REVISION 3)

(At current million US dollars and Percentages)

		Value added						Wages of employees				Exports as % of output, ISIC 4 digit code (In %)		
		Share in output (In %)		Per employee (In US$)		Share in manufacturing industry (In %)		Share of wages in value added (In %)		Wages per employee (In US$)				
Industry (ISIC Revision 3)	**ISIC**	**Brazil**	**Korea**	**Brazil**	**Korea**	**Brazil**	**Korea**	**Brazil**	**Korea**	**Brazil**	**Korea**	**Brazil**	**Korea**	
Processed meat,fish,fruit,vegetables,fats	**151**	33.0	31.0	27 005	56 393	6.2	1.1	17.0	27.7	4 446	15 634		Processing/preserving of meat (1511)	0.8
													Processing/preserving of fish (1512)	33.6
													Processing/preserving of fruit & vegetables (1513)	9.7
													Vegetable and animal oils and fats (1514)	1.1
Dairy products	**1 520**	30.0	42.6	26 584	229 758	1.2	0.8	19.0	12.6	4 894	28 900	1.7	0.3	
Grain mill products; starches; animal feeds	**153**	32.0	26.7	37 077	164 496	1.8	0.9	17.0	15.1	5 962	24 818		Grain mill products (1531)	1.6
													Starches and starch products (1532)	4.9
Other food products	**154**	45.0	44.8	18 498	83 439	5.4	2.0	24.0	22.1	4 348	18 423		Prepared animal feeds (1533)	0.6
													Bakery products (1541)	3.3
													Sugar (1542)	11.4
													Cocoa, chocolate and sugar confectionery (1543)	9.9
													Macaroni, noodles & similar products (1544)	10.2
													Other food products n.e.c. (1549)	5.2
Beverages	**155**	52.0	58.8	41 012	293 726	3.7	1.3	16.0	9.6	6 327	28 129			
													Distilling, rectifying & blending of spirits (1551)	7.1
													Wines (1552)	3.9
													Malt liquors and malt (1553)	2.6
													Soft drinks; mineral waters (1554)	2.2
Tobacco products	**1 600**	42.0	56.2	60 349	642 486	0.7	0.5	17.0	6.1	9 853	39 386	1.6	9.4	
Spinning, weaving and finishing of textiles	**171**	39.0	41.1	14 509	53 863	1.2	1.5	33.0	34.2	4 657	18 395		Textile fibre preparation; textile weaving (1711)	53.9
Other textiles	**172**	43.0	37.4	13 881	63 796	0.8	0.9	32.0	29.3	4 325	18 706		Made-up textile articles, except apparel (1721)	13.2
													Carpets and rugs (1722)	10.0
													Cordage, rope, twine and netting (1723)	36.4
													Other textiles n.e.c. (1729)	69.7

(Continued)

TABLE A.3 (continuation)

Knitted and crocheted fabrics and articles	**1 730**	37.0		12 456		0.2		34.0		4 167		15.2		
Wearing apparel, except fur apparel	**1 810**	43.0	50.8	5 968	58 453	1.5	2.0	47.0	27.4	2 780	16 020	6.0	13.8	
Dressing & dyeing of fur; processing of fur	**1 820**		47.5		98 077		0.1		20.8		20 356		4.9	
Tanning, dressing and processing of leather	**191**	31.0	34.5	12 168	67 596	0.5	0.3	31.0	28.7	3 697	19 386		Tanning and dressing of leather (1911)	61.9
													Luggage, handbags, etc.; saddlery & harness (1912)	12.9
Footwear	**1 920**	46.0	44.8	8 036	47 157	1.3	0.3	40.0	35.4	3 190	16 712	34.4	25.9	
Sawmilling and planing of wood	**2 010**	49.0	36.0	11 257	59 899	0.6	0.1	29.0	29.7	3 263	17 764	64.1	0.8	
Products of wood, cork, straw, etc.	**202**	44.0	33.4	13 302	59 859	0.9	0.4	30.0	34.8	3 939	20 823		Veneer sheets, plywood, particle board, etc. (2021)	3.1
													Builders' carpentry and joinery (2022)	0.7
													Wooden containers (2023)	0.8
													Other wood products; articles of cork/straw (2029)	9.1
Paper and paper products	**210**	46.0	36.0	33 944	89 007	3.6	1.7	20.0	26.6	8 788	23 705		Pulp, paper and paperboard (2101)	23.7
													Corrugated paper and paperboard (2102)	2.6
													Other articles of paper and paperboard (2109)	8.9
Publishing	**221**	65.0	59.7	18 307	91 571	2.3	1.5	27.0	27.8	8 864	25 410		Publishing of books and other publications (2211)	2.5
													Publishing of newspapers, journals, etc. (2212)	0.2
													Other publishing (2219)	17.2
Printing and related service activities	**222**	58.0	51.9	18 307	56 872	0.6	0.8	27.0	36.8	4 918	20 949		Printing (2221)	2.5
Reproduction of recorded media	**2 230**	61.0	58.4	96 734	96 395	0.3	0.0	12.0	24.1	10 934	23 206		Service activities related to printing (2222)	0.1
Coke oven products	**2 310**	40.0		65 432		-		10.0		6 203		0.4	...	
Refined petroleum products	**2 320**	67.0	18.2	845 948	1 165 647	12.3	3.5	5.0	5.4	37 222	63 455	7.4	26.1	
Processing of nuclear fuel	**2 330**	35.0	63.0	23 524	122 464	-	0.0	16.0	36.0	14 915	44 087		1.4	
Basic chemicals	**241**	29.0	26.1	94 086	284 430	4.7	4.2	25.0	13.2	12 568	37 617		Basic chemicals, except fertilizers (2411)	37.4
													Fertilizers and nitrogen compounds (2412)	16.7
													Plastics in primary forms; synthetic rubber (2413)	64.9
Other chemicals	**242**	45.0	50.4	51 488	160 621	6.4	4.0	21.0	16.2	11 133	25 987	22.3	Pesticides and other agro-chemical products (2421)	5.2
													Paints, varnishes, printing ink and mastics (2422)	16.1
													Pharmaceuticals, medicinal chemicals, etc. (2423)	10.1
													Soap, cleaning & cosmetic preparations (2424)	10.6
													Other chemical products n.e.c. (2429)	45.6
Man-made fibres	**2 430**	43.0	33.0	55 638	192 274	0.2	0.4	27.0	16.0	7 718	30 752		51.8	
Rubber products	**251**	44.0	47.2	29 007	99 269	1.3	1.3	30.0	23.7	5 707	23 518	4.9	Rubber tyres and tubes (2511)	56.9
													Other rubber products (2519)	8.9

(Continued)

TABLE A.3 (continuation)

Plastic products	**2 520**	38.0	36.9	19 479	68 145	2.5	3.5		30.1		20 497		13.1	
Glass and glass products	**2 610**	53.0	51.0	38 467	142 267	0.6	1.1	22.0	18.8	8 244	26 751	15.6	13.1	
Non-metallic mineral products n.e.c.	**269**	49.0	44.2	18 223	117 910	2.6	2.3	26.0	19.9	4 711	23 424		Pottery, china and earthenware (2691)	15.5
													Refractory ceramic products (2692)	4.1
													Struct.non-refractory clay; ceramic products (2693)	1.9
													Cement, lime and plaster (2694)	6.1
													Articles of concrete, cement and plaster (2695)	0.4
													Cutting, shaping & finishing of stone (2696)	1.4
													Other non-metallic mineral products n.e.c. (2699)	27.4
Basic iron and steel	**2 710**	44.0	32.2	11 4931	276 774	6.8	6.5	12.0	13.1	13 472	36 302	29.7	23.4	
Basic precious and non-ferrous metals	**2 720**	37.0	22.0	70 108	146 135	1.6	1.3	17.0	18.3	11 351	26 722	45.6	26.3	
Casting of metals	**273**	42.0	35.1	15 628	77 970	0.3	0.4	37.0	30.3	5 654	23 652		Structural metal products (2811)	6.6
Struct.metal products;tanks;steam generators	**281**	46.0	33.5	15 756	75 272	0.8	1.7	34.0	32.1	5 257	24 122		Tanks, reservoirs and containers of metal (2812)	20.1
													Steam generators (2813)	13.2
Other metal products; metal working services	**289**	46.0	43.2	22 420	61 157	3.3	3.4	28.0	33.6	6 119	20 558		Cutlery, hand tools and general hardware (2893)	32.7
													Other fabricated metal products n.e.c. (2899)	32.6
General purpose machinery	**291**	42.0	37.3	28 173	86 973	2.4	3.6	32.0	27.7	8 965	24 055		Engines & turbines(not for transport equip.) (2911)	19.0
													Pumps, compressors, taps and valves (2912)	38.8
													Bearings, gears, gearing & driving elements (2913)	22.6
													Ovens, furnaces and furnace burners (2914)	21.8
													Lifting and handling equipment (2915)	24.3
													Other general purpose machinery (2919)	21.7
Special purpose machinery	**292**	44.0	38.3	25 960	77 635	2.8	3.9	33.0	31.7	8 363	24 582		Agricultural and forestry machinery (2921)	14.8
													Machine tools (2922)	30.4
													Machinery for metallurgy (2923)	56.4
													Machinery for mining & construction (2924)	60.3
													Food/beverage/tobacco processing machinery (2925)	17.7
													Machinery for textile, apparel and leather (2926)	...
													Weapons and ammunition (2927)	5.0
													Other special purpose machinery (2929)	28.1

(Continued)

TABLE A.3 (Conclusion)

Domestic appliances n.e.c.	**2930**	36.0	35.9	30 115	111 465	0.7	1.2	27.0	20.0	8 083	22 330	16.9		35.2
Office, accounting and computing machinery	**3000**	31.0	37.7	40 568	112 841	0.6	1.0	27.0	21.5	10 645	24 274	13.7	...	
Electric motors, generators and transformers	**3110**	43.0	32.3	27 184	64 640	0.6	0.8	33.0	34.2	8 732	22 100	32.9		25.7
Electricity distribution & control apparatus	**3120**	51.0	38.5	31 322	75 677	0.5	1.0	34.0	29.0	10 545	21 946	15.2		17.9
Insulated wire and cable	**3130**	28.0	28.8	32 363	103 181	0.3	0.5	25.0	22.4	7 810	23 153	8.8		17.5
Accumulators, primary cells and batteries	**3140**	37.0	37.6	23 288	86 833	0.1	0.2	35.0	29.7	7 944	25 770	25.1	...	
Lighting equipment and electric lamps	**3150**	43.0	41.2	14 321	61 663	0.1	0.3	65.0	31.6	9 192	19 473	12.3		28.4
Other electrical equipment n.e.c.	**3190**	41.0	34.2	22 936	71 821	0.6	0.6	32.0	29.4	7 324	21 094	14.6		85.3
Electronic valves, tubes, etc.	**3210**	34.0	52.3	22 700	172 915	0.3	13.6	32.0	16.4	7 166	28 391	21.7		37.0
TV/radio transmitters; line comm. apparatus	**3220**	29.0	37.1	80 587	208 239	1.3	5.4	20.0	11.8	15 907	24 660	15.6		47.0
TV and radio receivers and associated goods	**3230**	32.0	36.4	50 579	89 819	0.7	1.6	17.0	33.1	8 230	29 711	12.3		
Medical, measuring, testing appliances, etc.	**331**	55.0	45.4	26 488	66 859	0.7	0.9	31.0	32.7		21 869		Medical, surgical and orthopaedic equipment (3311)	38.9
													Measuring/testing/navigatin g appliances,etc. (3312)	34.3
													Industrial process control equipment (3313)	15.6
Optical instruments & photographic equipment	**3320**	60.0	37.9	19 537	66 080	-	0.3	26.0	31.0	4 898	20 465	13.7		
Watches and clocks	**3330**	63.0	38.3	35 476	44 242	-	0.0	22.0	45.9	7 568	20 299	2.3		50.1
Motor vehicles	**3410**	29.0	32.4	7 6541	216 872	4.4	5.9	23.0	24.0	17 159	51 971	28.8		52.7
Automobile bodies, trailers & semi-trailers	**3420**	34.0	34.5	19 831	75 472	0.4	0.1	36.0	29.4	7 121	22 198	14.9		8.5
Parts/accessories for automobiles	**3430**	37.0	33.3	32 891	86 495	3.7	4.2	30.0	29.1	9 768	25 163	21.9		21.0
Building and repairing of ships and boats	**351**	39.0	31.3	19 460	100 261	0.2	3.0	40.0	40.4	7 766	40 539		Building and repairing of ships (3511)	57.9
													Building/repairing of pleasure/sport. boats (3512)	84.3
Railway/tramway locomotives & rolling stock	**3520**	50.0	43.9	38 009	156 416	0.3	0.2	24.0	22.7	8 836	35 435	13.8		4.2
Aircraft and spacecraft	**3530**	35.0	46.9	61 425	99 819	0.8	0.2	31.0	37.2	18 958	37 132	86.9		41.8
Transport equipment n.e.c.	**359**	31.0	35.9	40 988	59 511	0.6	0.1	22.0	38.0	8 689	22 608		Motorcycles (3591)	35.5
													Bicycles and invalid carriages (3592)	52.3
													Other transport equipment n.e.c. (3599)	9.9
Furniture	**3610**	38.0	35.9	9 721	62 608	1.0	0.9	39.0	30.3	3 706	18 997	21.4		5.9
Manufacturing n.e.c.	**369**	56.0	42.4	13 821	49 136	0.6	0.5	33.0	36.6	4 530	17 994		Jewellery and related articles (3691)	77.3
													Musical instruments (3692)	72.5
													Sports goods (3693)	39.5
													Games and toys (3694)	42.0
													Other manufacturing n.e.c. (3699)	45.2
Recycling of metal waste and scrap	**3710**	44.0	21.4	20 472	111 729	-	0.1	30.0	20.9	5 972	23 292			
Recycling of non-metal waste and scrap	**3720**	58.0	42.0	10 702	60 175	-	0.1	29.0	29.6	3 025	17 785			
Total manufacturing		**42.0**	**36.7**	**30 834**	**111 989**	**100.0**	**100.0**	**22.0**	**22.4**	**6 599**	**25 109**			

Source: UNIDO Industrial Statistical Yearbook 2008.

TABLE A. 4

ARGENTINA, CHILE AND COLOMBIA: SHARE OF SMES IN TOTAL EXPORTS AND MANUFACTURED EXPORTS 2004, BY AREAS/COUNTRY DESTINATION

(In million dollars and percentages)

				by SMEs	(C)/(A)	(C)/(B)			by SMEs	(C)/(A)	(C)/(B)			by SMEs	(C)/(A)	(C)/(B)
		Value (A)	Value (B)	Value (C)	(%)	(%)	Value (A)	Value (B)	Value (C)	(%)	(%)	Value (A)	Value (B)	Value (C)	(%)	(%)
Mercosur	Brazil	5 587	4 277	516	9.2	12.1	1 400	425	51	3.6	12.0	137	99	3	2.2	2.2
amplified	Argentina						438	331	56	12.8	16.9	35	34	2	5.7	5.7
	Chile	3 839	1 879	302	7.9	16.1						245	215	13	5.3	5.3
	Other	1 183	1 002	193	16.3	19.3	98	90	16	16.3	17.8	7	7	1	14.3	14.3
	Subtotal	10 608	7 158	1.010	9.5	14.1	1 936	845	123	6.4	14.6	425	355	19	4.5	4.5
CAN	Colombia	273	214	37	13.6	17.3	306	263	27	8.8	10.3					
	Ecuador	196	189	22	11.2	11.6	319	278	26	8.2	9.4	1 000	901	84	8.4	8.4
	Venezuela (Rep. Bol. of)	434	404	53	12.2	13.1	270	242	28	10.4	11.6	1 603	1 411	152	9.5	9.5
	Peru	495	355	55	11.1	15.5	506	440	71	14.0	16.1	532	434	21	3.9	3.9
	Bolivia (Plur. State of)	297	278	49	16.5	17.6	132	129	21	15.9	16.3	58	58	3	5.2	5.2
	Subtotal	1 696	1 441	216	12.7	15.0	1 532	1 353	174	11.4	12.9	3 194	2 804	260	8.1	8.1
NAFTA	USA	3 733	2 756	314	8.4	11.4	4 466	2 521	367	8.2	14.6	6 504	2 880	246	3.8	3.8
	Canada	177	147	29	16.4	19.7	769	165	31	4.0	18.8	155	93	4	2.6	2.6
	Mexico	1 035	1 004	105	10.1	10.5	1 286	772	116	9.0	15.0	508	497	56	11.0	11.0
	Subtotal	4 944	3 908	448	9.1	11.5	6 521	3 458	513	7.9	14.8	7 167	3 470	307	4.3	4.3
European Union		6 101	4 430	423	6.9	9.5	7 666	2 160	417	5.4	19.3	2 325	1 043	72	3.1	3.1
Rest of the Americas		784	753	116	14.8	15.4	678	609	60	8.8	9.9	1 912	1 337	146	7.6	7.6
Rest of Eruope		845	705	90	10.7	12.8	647	136	32	4.9	23.5	301	193	4	1.3	1.3
Asia and Oceania		6 583	3 895	172	2.6	4.4	11 157	2 945	253	2.3	8.6	809	628	25	3.1	3.1
Africa and others		2 988	1 638	94	3.1	5.7	505	472	29	5.7	6.1	350	327	24	6.9	6.9
Total		**34 550**	**23 928**	**2.568**	**7.4**	**10.7**	**30 641**	**11 977**	**1 601**	**5.2**	**13.4**	**16 483**	**10 157**	**857**	**61.6**	**5.2**

Source: ECLAC based on the information in Dario Milesi, Virginia Moori Koenig and Gabriel Yoguel Coodinators (2007),"Estudio comparado sobre el éxito exportador PYME en Argentina, Chile y Colombia", FUNDES.

TABLE A. 5
EVOLUTION OF VALUE-ADDED IN MARKET-ORIENTED KNOWLEDGE-INTENSIVE SERVICES, BY SECTOR 1985-2005

(In Million of 2000 US Constant Dollars and Percentages)

All market-oriented knowledge-intensive services	Average 1985-1990	Growth rates 1985-1990	Average 1991-1995	Growth rates 1991-1995	Average 1996-2000	Growth rates 1996-2000	Average 2001-2005	Growth rates 2001-2005	Share in 2001-2005
United States	1487 332	3.5%	1708 527	2.4%	2095 687	5.7%	2520 889	3.4%	40.3%
EU	845 825	5.6%	1067 581	2.7%	1293 941	4.9%	1581 246	3.0%	25.3%
Asia	536 124	8.4%	780 225	5.8%	1041 808	5.0%	1365 915	5.2%	21.8%
China	46 449	11.5%	75 379	12.4%	133 903	12.9%	259 872	14.0%	4.2%
India	14 254	11.5%	25 148	11.1%	40 457	10.9%	64 153	9.5%	1.0%
Japan	412 198	7.2%	561 753	3.6%	696 852	3.6%	822 238	2.0%	13.1%
Korea, Respublic of	22 184	16.8%	47 186	13.2%	65 340	0.9%	84 998	6.4%	1.4%
Taiwan Province of China	15 119	15.8%	25 904	9.8%	42 246	8.8%	53 665	3.9%	0.9%
ASEAN(5)	25 921	10.2%	44 853	10.7%	63 010	2.5%	80 988	7.3%	1.3%
Indonesia	5 900	7.1%	9 735	10.6%	12 029	2.4%	17 483	9.5%	0.3%
Malaysia	3 711	7.8%	6 525	13.7%	11 035	6.9%	16 465	8.1%	0.3%
Philippines	3 542	11.9%	4 786	3.9%	7 390	6.7%	10 607	12.4%	0.2%
Singapore	8 527	8.9%	15 224	11.1%	23 250	5.3%	27 259	3.2%	0.4%
Thailand	4 241	18.5%	8 584	11.9%	9 305	-11.2%	9 174	8.4%	0.1%
Latin America (5)	125 913	1.5%	185 544	7.4%	202 577	2.6%	220 896	2.2%	3.5%
Argentina	20 297	0.1%	29 191	11.5%	42 115	5.3%	38 677	-1.2%	0.6%
Brazil	73 535	2.1%	112 876	5.4%	100 985	-1.3%	104 082	2.3%	1.7%
Chile	2 907	9.1%	5 375	11.1%	10 624	5.1%	13 042	4.6%	0.2%
Costa Rica	1 077	4.1%	1 370	5.7%	1 768	6.4%	2 602	9.0%	0.0%
Mexico	28 097	0.2%	36 733	8.4%	47 085	7.9%	62 493	3.5%	1.0%
All others	295 759	4.2%	359 887	3.9%	444 118	5.4%	563 930	5.6%	9.0%
World	3290 953	4.8%	4101 764	3.4%	5078 131	5.2%	6252 876	3.8%	100.0%
Communication services	**Average 1985-1990**	**Growth rates 1985-1990**	**Average 1991-1995**	**Growth rates 1991-1995**	**Average 1996-2000**	**Growth rates 1996-2000**	**Average 2001-2005**	**Growth rates 2001-2005**	**Share in 2001-2005**
United States	165 008	3.6%	210 970	5.5%	281 874	7.9%	382 325	5.0%	38.5%
EU	88 169	5.4%	117 891	3.9%	159 714	9.3%	231 075	4.3%	23.3%
Asia	46 334	7.1%	66 332	8.4%	124 581	13.6%	216 467	8.0%	21.8%
China	3 049	15.9%	8 073	26.7%	23 433	21.8%	59 511	17.8%	6.0%
India	1 592	5.5%	2 421	13.4%	5 119	17.8%	14 006	21.6%	1.4%
Japan	32 808	5.1%	39 303	3.3%	67 523	11.9%	94 953	1.1%	9.6%
Korea, Respublic of	2 166	20.9%	5 282	15.3%	9 289	7.5%	17 450	6.8%	1.8%
Taiwan Province of China	1 474	11.8%	2 648	9.7%	5 283	21.4%	9 349	4.5%	0.9%
ASEAN(5)	5 247	8.9%	8 606	10.7%	13 933	7.8%	21 197	8.8%	2.1%
Indonesia	1 595	4.8%	2 342	9.6%	3 571	6.4%	5 975	15.7%	0.6%
Malaysia	640	6.9%	1 118	12.2%	2 039	10.8%	3 242	6.6%	0.3%
Philippines	463	11.0%	695	6.1%	1 334	17.0%	3 150	17.3%	0.3%
Singapore	2 023	9.9%	3 192	8.9%	4 829	7.9%	6 110	1.0%	0.6%
Thailand	526	19.4%	1 259	18.6%	2 160	2.0%	2 721	5.3%	0.3%
Latin America (5)	9 706	5.0%	16 781	13.3%	28 279	9.9%	44 042	6.2%	4.4%
Argentina	2 283	1.7%	3 792	15.8%	7 078	9.9%	8 834	3.3%	0.9%
Brazil	5 059	4.5%	7 942	11.4%	12 363	8.7%	18 385	5.8%	1.9%
Chile	297	9.8%	727	15.5%	1 256	11.9%	2 197	8.5%	0.2%
Costa Rica	388	6.0%	400	9.7%	568	6.5%	1 112	13.6%	0.1%
Mexico	1 679	9.7%	3 920	15.1%	7 014	12.1%	13 514	8.1%	1.4%
All others	75 638	7.9%	94 506	3.4%	118 392	5.6%	169 955	5.8%	17.1%
World	378 072	4.8%	493 620	5.2%	691 574	8.8%	992 037	5.7%	100.0%

(continued)

TABLE A.5 (Conclusion)

Financial services	Average 1985-1990	Growth rates 1985-1990	Average 1991-1995	Growth rates 1991-1995	Average 1996-2000	Growth rates 1996-2000	Average 2001-2005	Growth rates 2001-2005	Share in 2001-2005
United States	533 239	0.8%	579 126	0.7%	659 888	5.7%	813 414	2.6%	38.6%
EU	317 721	3.6%	359 077	1.0%	376 825	0.1%	409 375	3.6%	19.4%
Asia	255 191	13.8%	379 649	4.6%	471 762	3.6%	607 812	5.9%	28.9%
China	32 728	14.8%	50 095	10.0%	83 244	11.8%	152 307	13.0%	7.2%
India	6 334	17.9%	12 534	12.3%	19 981	8.7%	26 535	5.0%	1.3%
Japan	182 838	13.0%	252 527	1.4%	279 970	1.7%	322 152	2.8%	15.3%
Korea, Respublic of	11 460	17.9%	25 086	14.5%	33 027	-1.3%	41 847	7.5%	2.0%
Taiwan Province of China	11 112	18.6%	19 024	9.3%	29 978	6.9%	35 739	3.9%	1.7%
ASEAN(5)	10 719	13.4%	20 382	11.7%	25 562	-2.4%	29 232	6.6%	1.4%
Indonesia	1 989	9.9%	3 651	10.9%	3 687	-3.5%	4 571	5.1%	0.2%
Malaysia	1 251	8.3%	2 090	12.5%	3 474	7.3%	5 499	8.8%	0.3%
Philippines	1 380	18.9%	2 023	4.2%	3 219	5.5%	3 367	2.9%	0.2%
Singapore	3 297	9.2%	6 500	13.7%	9 703	4.3%	11 264	4.7%	0.5%
Thailand	2 802	21.5%	6 118	12.7%	5 478	-20.8%	4 532	14.3%	0.2%
Latin America (5)	53 802	2.2%	87 006	1.7%	59 756	-0.8%	67 946	3.1%	3.2%
Argentina	4 108	0.2%	6 041	13.4%	10 268	8.7%	7 902	-8.8%	0.4%
Brazil	40 087	2.4%	68 354	-2.0%	34 408	-5.9%	38 190	3.0%	1.8%
Chile	1 198	8.9%	2 185	11.3%	3 793	3.9%	4 555	5.2%	0.2%
Costa Rica	381	2.7%	527	3.8%	650	5.7%	874	7.7%	0.0%
Mexico	8 028	1.3%	9 899	7.7%	10 638	5.0%	16 425	9.9%	0.8%
All others	102 979	3.8%	129 557	5.5%	161 134	5.5%	207 076	6.8%	9.8%
World	1262 932	4.2%	1534 415	2.2%	1729 366	3.7%	2105 623	4.2%	100.0%
Business services	**Average 1985-1990**	**Growth rates 1985-1990**	**Average 1991-1995**	**Growth rates 1991-1995**	**Average 1996-2000**	**Growth rates 1996-2000**	**Average 2001-2005**	**Growth rates 2001-2005**	**Share in 2001-2005**
United States	789 085	5.4%	918 430	2.8%	1153 926	5.2%	1325 151	3.5%	42.0%
EU	439 936	7.1%	590 613	3.4%	757 402	6.4%	940 796	2.4%	29.8%
Asia	234 598	3.4%	334 244	6.7%	445 465	4.2%	541 635	3.2%	17.2%
China	10 673	1.2%	17 211	13.1%	27 226	9.1%	48 054	12.5%	1.5%
India	6 328	7.1%	10 194	9.1%	15 356	11.4%	23 612	8.2%	0.7%
Japan	196 552	2.7%	269 923	5.8%	349 360	3.6%	405 133	1.5%	12.8%
Korea, Respublic of	8 558	14.3%	16 819	10.6%	23 024	1.2%	25 701	4.5%	0.8%
Taiwan Province of China	2 534	7.2%	4 232	12.3%	6 985	7.8%	8 577	3.0%	0.3%
ASEAN(5)	9 954	7.5%	15 865	9.4%	23 515	4.8%	30 559	6.9%	1.0%
Indonesia	2 316	6.3%	3 742	10.9%	4 770	4.4%	6 937	7.3%	0.2%
Malaysia	1 820	7.8%	3 318	15.1%	5 522	5.3%	7 725	8.1%	0.2%
Philippines	1 699	7.0%	2 068	2.9%	2 837	3.4%	4 090	18.1%	0.1%
Singapore	3 207	7.9%	5 532	9.8%	8 718	4.9%	9 886	2.9%	0.3%
Thailand	912	9.8%	1 206	2.5%	1 667	5.7%	1 921	0.4%	0.1%
Latin America (5)	62 405	0.3%	81 755	10.4%	114 542	2.9%	115 132	0.4%	3.6%
Argentina	13 907	-0.2%	19 357	10.1%	24 769	-0.7%	23 643	0.2%	0.7%
Brazil	28 388	1.3%	36 579	12.4%	54 214	4.5%	49 448	0.7%	1.6%
Chile	1 412	9.1%	2 463	9.7%	5 576	7.2%	6 651	3.0%	0.2%
Costa Rica	307	3.5%	442	4.7%	550	7.9%	835	5.7%	0.0%
Mexico	18 391	-1.3%	22 913	7.6%	29 433	2.6%	34 556	-0.4%	1.1%
All others	123 924	3.6%	148 687	3.6%	185 856	5.6%	255 883	4.4%	8.1%
World	1649 949	5.3%	2073 729	3.9%	2657 191	5.3%	3155 216	3.1%	100.0%

Source: ECLAC's calculation based on US Science and Engineering Indicators 2008.

Notes: Knowledge-intensive services classified by Organisation for Economic Co-operation and Development (OECD) and include business, financial, communications, education, and health services. Market-oriented knowledge-intensive services exclude education and health services. Non-market-oriented knowledge-intensive services include education and health. Value-added revenue excludes purchases of domestic and imported materials and inputs. EU excludes Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, and Slovenia. China includes Hong Kong. Constant dollar data for foreign countries calculated by deflating industry data valued in each country's nominal domestic currency with a sector-specific price index constructed for that country and then converted to U.S. dollars based on average annual exchange rates.

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