Sistema Económico
Latinoamericano y del Caribe

Latin American and Caribbean
Economic System

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Système Economique
Latinoaméricain et Caribéen

Productive development and industrialization in Latin America and the Caribbean

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C O N T E N T S

F O R E W O R D

The Permanent Secretariat of SELA is pleased to submit this study entitled "Productive development and industrialization in Latin America and the Caribbean" to the Latin American and Caribbean governments, the international and regional organizations in charge of integration, trade, financing and development, academic institutions and all those persons interested in the development of Latin America and the Caribbean.

This document was prepared pursuant to Activity I.1.1. of the Work Programme of SELA for the year 2012 (Compliance with the tasks stemming from the mandates of CALC and CELAC) and Decision No. 527 (2011) of the Latin American Council, which requested to attach priority in SELA's Work Programme to the activities related to the Community of Latin American and Caribbean States (CELAC) and to the decisions to be adopted by the Heads of State and Government at the Latin American and Caribbean Summit, which will be held in Caracas on 2 and 3 December 2012.

As a matter of fact, the 2012 Caracas Action Plan adopted by the Presidents, in its section on "Complementarity and cooperation between regional and subregional integration mechanisms" makes a recommendation "to consider the possibility of holding a Latin American and Caribbean conference on productive and industrial development."

In view of such goal, this report is intended to provide conceptual and analytical elements that allow for assessing the productive and industrial development process that has been underway in Latin America and the Caribbean since the 1990s, in order to highlight its main characteristics and trends, so as to offer policy alternatives for regional cooperation actions to promote the generation and implementation of regional plans, programmes and policies.

The document has five sections. The first section reviews the conformation of the productive structure and its capacity to generate investment, and promote technology, trade and productivity improvements. The second chapter highlights the importance of productive and industrial development at the regional level, as a key element to deepen current integration. The third section provides some policy instruments that should be considered as part of a regional productive development policy. The fourth chapter suggests some sectoral niches to promote technological collaboration between two or more countries. And the final section contains a series of conclusions and policy proposals.

The Permanent Secretariat wishes to express its gratitude and recognition to Dr. Claudia Schatan for her dedication to the preparation of this study.

EXECUTIVE SUMMARY

The issue of regional integration in Latin America and the Caribbean is once again a topic of interest nowadays for different reasons: its potential has never been quite exploited; the current recession or stagnation in the developed world – with which there is a crucial relation regarding investments, exports, and participation in global value chains – an important progress has been registered in the interconnection among countries thanks to the development of several technologies, infrastructure, and transport; and finally, there is a much stronger regional market (as a result of its population increase and the expansion of its middle class).

Furthermore, in the 2000s there has been a revision of the economic politics implemented in the last two decades, and increasing importance has been given to industrial or productive development policy. This revision is the result of a search for alternatives to the policies of the Washington Consensus, given the limited impact that these policies had on development and growth in Latin America and the Caribbean. Overall, Gross Domestic Product (GDP) per capita in the countries of the region has not managed to initiate a convergence with the most developed countries throughout the last decades and the issues of inequality and poverty have not been solved.

In this study, it can be noted that the economies of Latin America and the Caribbean have had a low dynamics of economic growth over the last 21 years in comparison with China, India, and the Southeast Asian countries such as Korea, Malaysia, Indonesia, Thailand, and Vietnam. Their structure of GDP shows a great predominance of the service sector, which on average represents 67.8% of total GDP in the mentioned period, followed by the secondary sector, representing 21.2%, and the primary sector, with 11%. The countries of Latin America and the Caribbean were divided into four categories, according to the size of their GDP. The smallest economies had the worst economic performance during the last 21 years. Taking into account that most of these countries are particularly vulnerable to natural disasters, and, among other problems, they seem to require special attention when it comes to the development of the region.

The analysis also reveals that the productive structure of Latin America and the Caribbean has changed for the advantage of the service sector, which displays a very negative performance in terms of productivity. Despite the modernization the service sector might have had in financial intermediation, transport, and telecommunications; plus the creation of new service niches, for instance, business services, all these factors have not managed to thwart the performance of the wide sector of low productivity services. Indeed, this sector has been the recipient of the workforce that has shifted from the remaining economic sectors.

The overall slowdown of this group of economies in terms of productivity is due to low rates of investment in virtually all the productive sectors; the lack of expenditure on Scientific and Technological Activities (STAs) and Research and Development Activities (R&D); and finally, to the breaking up of productive chains.

As for the external sector performance of Latin America and the Caribbean, it has been variable during the period 1990-2011, showing a great dynamism in their exports during the first decade and a substantial slowdown during the second decade. However, the opposite was observed in imports. This fact, along with the imports ratio being higher that the exports ratio in three out of four groups of countries studied lead to a negative external deficit in most part of the region. Most of the countries feature a specialization in

exports, focusing on low technology products, followed by medium-low technology products, and very scarce exports of high technology products.

In order to set out a new course in the region in a cooperative way, a policy of productive development or a shared industrial policy is required. Such policy should underscore the fostering of technology in the different spheres of production by exploring new niches where progress in R&D can be harnessed; integration of productive chains within the region can be achieved; public-private partnerships are promoted; efforts are made to promote regional initiatives featuring further inclusion of the least developed regions; and finally, where funding of productive projects on a regional level is provided.

In many fields there are already important experiences concerning sub-regional productive development policies that could be duplicated in Latin America and the Caribbean in a more comprehensive manner. A shared strategic vision for productive development could contribute to: (1) fully harness the benefits of direct foreign investment (DFI), for instance, by encouraging the training of suppliers for DFI on a regional level; (2) promote public-private partnerships, whose presence is scarce on a sub-regional level (for example, infrastructure development, automotive sector), but it could be intensified by involving trans-latin companies and governments; (3) increase and/or unfreeze funding to productive sectors, especially the most vulnerable ones, such as Small and Medium-sized Enterprises (SMEs), and, at the same time, increase their associability and the establishment of productive chains beyond the national borders; (4) develop and make the most of the interconnectivity through Information and Communication Technologies (ICTs) in order to boost regional businesses, the creation of capabilities and R&D; plus, (5) fully harness new funding sources to develop environmental services that allow to protect the environment and, at the same time, generate employment in poor and remote areas, frequently located in border areas.

I. INTRODUCTION

Latin American and Caribbean countries have pass through all the stages of the economic policies applied since the 1950s in non-Asian developing countries. The process of import substitution developed from that time boosted national manufacture and from the 1980s, the adoption of economic reforms featuring openness, markets liberalization, and back-down of the State from the economic sphere resulted in a great rise in the region's foreign trade and changes in their economic structure. In the 2000s, the policies adopted over the last two decades have been readjusted because the strengthening of international trade has had a limited impact on development and growth. In general, Gross Domestic Product (GDP) per capita of the region's countries has not managed to meet the GDP of the developed countries over the last 30 years and the problems of inequality and poverty have not been solved.

The issue of regional integration in Latin America and the Caribbean is once again a topic of interest due to multiple factors, such as 1) its potential has never been quite exploited; 2) the recession or stagnation in the developed world – with which there is a crucial relation regarding investments, exports, and participation in global value chains – 3) the multiple new ways of interconnection among countries thanks to the development of several technologies, infrastructure, and transport; and finally, 4) the strengthening of the inter-regional market, as a result of its population increase and the expansion of its middle class.

The countries of Latin America and the Caribbean have made important efforts over several decades to achieve a deeper regional economic integration as one of the means to reach higher levels of development. Since the 1950s, Prebisch noted that inter-regional space was crucial to attain more diversification and technological sophistication in production and exports, in comparison with those offered by the of the primary-export model. Still, there was a limited progress in regional integration in the 1960s and 1970s due to several problems, and, paradoxically, to their own protection policy applied in those countries. (Ocampo, 2001).

Since the external openness adopted in the 1980s, there has been an increase of inter-regional trade among the countries of Latin America and the Caribbean. The greatest dynamism in inter-regional trade occurred between 1990-1997 in the Southern Common Market (MERCOSUR), the Andean Community (CAN), and the Central American Common Market (CACM). In the first two cases, trade multiplied by 5 and 4.2, respectively, during that period (Ocampo, 2001). Moreover, inter-regional trade included products of greater added value than those products exported to third countries. However, consistently with the rest of the world, inter-regional trade itself has not shown the expected results in terms of productive development. Besides, the backward countries of the region have not been able to bridge the gap with their more developed partners.

In Latin America and the Caribbean, the temptation to go back to specialization in natural resources without greater added value has been very strong over the last years, given the upward trend in the prices of these primary products (although their volatility continues) due to a shortage of these products in other regions featuring high growth, especially China; and also to the fact that the region has abundant reserves of these products. Worldwide, the region produces almost half of the world's soy, nearly a third of the world's meat, and about a quarter of global milk. In the minerals sector, increasingly demanded by several industries, the region produces 45% of the world's cupper, more

than 20% of total molybdenum, zinc, and tin, and 40% of the total international production of biofuels (ECLAC and AECID, 2011).

This document suggests that is it worth considering production options featuring deeper and long-lasting effects for the countries' development and that a greater productive and technological integration can contribute to that aim. In a world where technological innovation has become an important engine for the economies, it seems that cooperation in R&D among the region's countries might lead to a better exploitation of the scarce resources they have individually with the purpose of increasing their technological level through a shared effort. This is proposed in a large-scale scenario, with the aim of adding value to the natural resources, manufacture, and service, without leaving aside the less sophisticated technological advances required by local producers. The study is to present a variety of experiences concerning the implementation of productive development policies, their advantages, disadvantages, and the collaboration experiences on the subject of productive development policies among the countries of Latin America and the Caribbean.

In the first section, this document features an analysis of indicators of the structural changes of the economies and their dynamism over the last decades, the incorporation (or lack of incorporation) of technology into exports, the sectoral productivity, among others. Second, an analysis on trade and productive integration on a regional level is presented, taking into account aspects of the asymmetries and the role of foreign direct investment (FDI), especially in the trans-latin enterprises. The third chapter focuses on the productive development policies in the region, taking into consideration the experiences of previous periods and also more recent experiences such as the resurgence of development banking, establishment of suppliers, knowledge and foreign investment networks, and public-private partnerships. Fourth, an analysis will be made on the challenges the region faces in terms of technological innovation. Finally, some conclusions and draft proposals concerning regional policies will be presented.

1. Characteristics of the economies of Latin America and the Caribbean and the transformations during the period 1990-2011

The countries of Latin America and the Caribbean have very heterogeneous features, including the size of their economies, per capita income, the extension of their territories, income distribution, institutional environment, business climate, among many other aspects.

1.1 Evolution of GDP, productive structure and productivity

Despite the large asymmetries among the region's countries, some generalizations can be made when observing the evolution of Latin America with a long-term vision, with the exception of the Caribbean. The official statistics show that GDP in Latin America reached a 3.2% average annual growth rate between 1990 and 2011, that is to say, much lower rates than those reached by countries such as China, India, Korea, among others. The Caribbean reached a 2.4% GDP average annual growth rate, lower than that of Latin America and the Caribbean as a whole. It should be noted that Caribbean economies are highly vulnerable: their geographic location causes isolation; they feature high vulnerability to natural disasters, security weakness, and dependence on external capital. In addition, these economies are price-takers, lacking the ability to establish their own rules to insert themselves into globalization. (ECLAC, 2011). It is evident that economic reforms carried out during the period of trade openness did not have a satisfactory performance.

The GDP structure of Latin America and the Caribbean in the period 1990-2011 shows a strong predominance of the service sector, which accounted for 67.8% of total GDP

during the mentioned period (with commerce generating 14.4%, financial sector 15.7%, and health, education, security and defence items, as a whole, 18.2%); followed by the secondary sector, accounting for 21.2% of total GDP (the manufacture industry highlights, accounting for 16.6%), and the primary sector with 11% of total GDP (mining sector generates 6.7% and agriculture 4.3%)[1] (see Table 1).

TABLE 1
Average productive structure and structural change: 1990-2011

	Primary Sector	Agric.	Mining	Second-ary	Manu-facture	Services	Tourism	Finance	Trade	Total
Latin America and the Caribbean	11	4.3	6.7	21.2	16.6	67.8	2.9	15.8	14.3	100
Latin America	11.6	5	6.6	21.2	16.8	67.2	2.8	15.7	14	100
The Caribbean	18.9	5	13.9	11.5	7.1	69.6	11.8	16.9	18.2	100
Latin America and the Caribbean	-2.2	-1.44	-0.76	-2.13	-2.15	4.33	-0.14	1.45	0.09	
Latin America	-2.34	-1.42	-0.92	-2.23	-2.25	4.57	-0.07	1.47	0.13	
The Caribbean	9.68	-0.41	10.09	-2.33	-2.42	-7.35	0.12	-0.03	-2.5	

Source: http://websie.eclac.cl/sisgen/ConsultaIntegrada.asp

During the studied period, a relevant change in the productive structure was recorded in Latin America and the Caribbean (but not in the same sense as in the Caribbean). That is to say, the presence of the service sector increased 4.6 percentage points, while the secondary sector presence shrank – in which manufacture leads (-2.25) – as well as the primary sector's presence (-2.34), especially the agricultural sector (-1.42)[2] (See Table 1).

Although the productive structure of the developed countries has also change in benefit of the service sector, it entails a structural change in favour of the most productive sectors. The contrary occurs in Latin America and the Caribbean, where there is still low productivity in the service sector (as described ahead). The manufacturing sector has been and will continue to be a boosting agent for economy and employment because it can generate chaining, as proved by the Southeast Asian countries' case. The former does not mean that specialization in primary products is not a viable option for some countries, if at the same time high levels of productivity and productive diversity are achieved.

Taking into account the asymmetries in the countries of Latin America and the Caribbean that were already pointed out, they will be divided into four: very small countries,[3] small

1 In the Caribbean, the service sector is also predominant, but the secondary sector only accounts for 11.3% of total GDP, while the primary sector accounts for 18.9% of total GDP because of the mining industry.

2 The primary sector has raised its share in the Caribbean given an important increase in the share of the mining industry in GDP in the past four years.

3 The average annual GDP of this group amounts to up to US$ 10.99 billion from 2001 to 2010: Antigua, Barbados, Bahamas, Dominica, Grenada, Guyana, Haiti, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Saint Lucia and Suriname in the Caribbean; Belize, Nicaragua and Honduras in Central America; Bolivia and Paraguay in South America.

countries,[4] medium-sized countries[5] and large countries,[6] according to their GDP size (see Table 2).

The group with the smallest economies features considerable variations in its institutional environment and its growth experiences, as noted in a recent paper (ECLAC, |2011). Its dynamism in GDP growth was inferior to that of Latin America and the Caribbean between 1990 and 2011 (2.6%).[7] The manufacture sector share in the region's manufacturing GDP was barely 9%, despite the fact that the group is made up by 16 countries. This ensemble of countries can be subdivided into two categories: countries whose predominant exports are manufactures, and countries that export agricultural products or a certain mineral (*commodities)*. Regardless of their specialization, they are very open economies given their limited domestic market, which for some of them can result in elevated foreign trade shares, as it will be further discussed.

TABLE 2
Productive structure of Latin America and the Caribbean by GDP size: 1990-2011 (%)

	Agricul -ture	Mining	Manu-facture	Cons-truction	Tourism	Trade	Trans-port	Finance	Health, Sec. Def.	Others	TOTAL
Very small	7.7	2.6	9.0	2.8	4.3	16.8	9.3	15.8	18.2	12.9	100.0
Small	8.3	5.8	14.6	2.1	1.9	17.0	8.2	14.4	18.6	9.1	100.0
Medium-sized	6.2	12.9	16.3	2.3	2.2	12.4	6.9	14.9	17.3	8.6	100.0
Large	10.5	4.7	16.9	2.3	1.3	14.7	7.5	16.6	16.5	9.2	100.0

Source: http://websie.eclac.cl/sisgen/ConsultaIntegrada.asp

The group of small economies showed better economic performance in the studied period: its average annual GDP rate reached 4%, a higher rate than the whole region's rate. Even though they share some of the problems mentioned beforehand, their economies feature greater diversification, mostly in the agricultural and manufacturing sectors; and in Panama's case, in the service sector, particularly in the transport and financial intermediation industries.

The medium-sized economies group has also a 4% average annual GDP rate. Except for Venezuela, the remaining countries of this group – Argentina, Colombia, Chile, and Peru – recorded GDP growth rates over the average. Argentina has the most diversified economic structure, featuring relatively important agricultural and manufacturing sectors, whereas in the other three countries the share of the mining sector (including oil) is over the region's average.

4 The average annual GDP of this group ranges from US$ 11 billion up to US$ 80 billion in the last ten years: Jamaica, Trinidad and Tobago, Dominican Republic, Cuba, El Salvador, Panama, Costa Rica, Guatemala, Ecuador and Uruguay.

5 The GDP of this group ranges from US$ 86 billion to US$ 200 billion: Colombia, Chile, Peru, Venezuela and Argentina.

6 Their average annual GDP amounts to more than US$ 800 billion: Mexico and Brazil.

7 Only five out of 16 countries in the group with very small economies recorded a GDP growth over the region's average: Guyana, Nicaragua, Honduras, Belize and Bolivia.

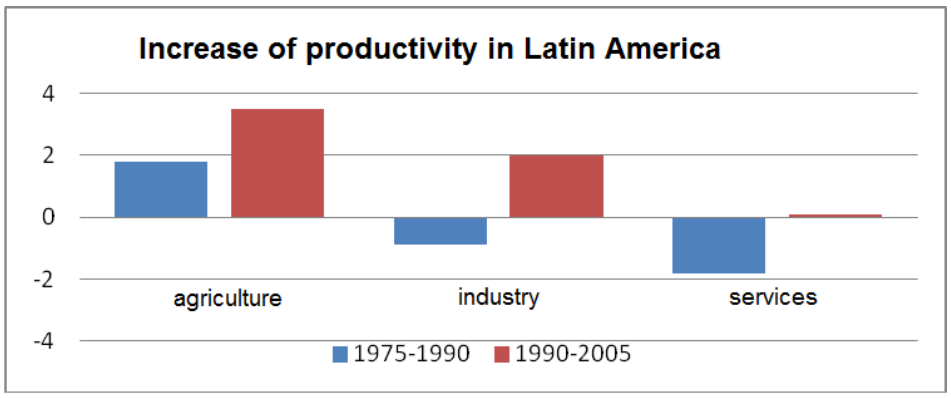
Finally, Brazil and Mexico, classified as large economies, feature a diversified productive structure, with a manufacturing sector with cumulative experience and higher added value than small and medium-sized economies. Brazil recorded a 3.1% growth rate in the total 21-year period analyzed, and a 3.6% growth rate from 2000 to 2011, both rates near the average for that period. On the contrary, Mexico recorded a 2.6% annual growth rate in the total 21-year period from 1990, but it shrank to 2% annually in the period 2000-2011. Nevertheless, Mexico records a higher average rate of GDP growth (3.1%) between 1990 and 2000, the period in which the Free Trade Agreement (FTA) with Canada and the United States of America (U.S.) was signed. That period also coincides with the economic boom in the U.S. (although that also made Mexico more vulnerable to the 2001-2002 recession and the U.S. financial crisis, which explains why its growth was one of the lowest in Latin America).

In brief, the small and medium-sized countries recorded a better performance in terms of GDP growth, in comparison with the very small and large countries.

A third important subject to understand the performance of Latin American and Caribbean countries is the productivity of their economies. Overall, and despite their structural heterogeneity, it can be asserted that in Latin America and the Caribbean, productivity increases in their most modern sectors have not manage to spread throughout the economies. Indeed, the growth of this indicator was very low in the period 1990-2011. Still, the indicator improved in comparison with the period 1975-1990, as shown in Figure 1.

A recent study by the Inter-American Development Bank (IDB) shows that between 1990 and 2005, there was a 3.5% productivity increase in the agriculture sector, which had grown 1.8% annually between 1975 and 1990. In that period, the debt crisis and the lost decade stressed the stagnation of productivity in Latin American and the Caribbean. For its part, the industrial productivity during the first period grew 0.9%, and 2% in the second period. Finally, the productivity of the service sector shows the worst scenario. It went from a -1.8% negative growth between 1975 and 1990, to 0.1%, a slight improvement, but still it shows a state of stagnation.

CHART 1
Increase of productivity in Latin America and the Caribbean



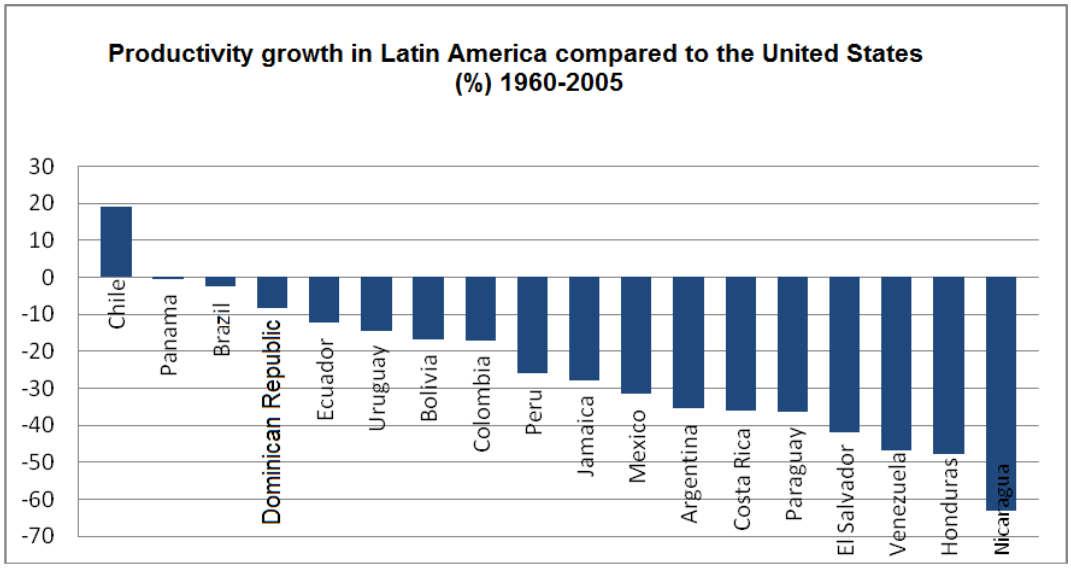
Source: Pages, IDB, 2010

As for the performance in productivity of Latin America in comparison with international standards, the United States serves as a useful point of reference. The IDB (Pages, 2010) offers information on this matter by reporting the productivity growth rates of Latin American countries and the Dominican Republic. In the period 1960-2005, only Chile exceeded the growth in productivity recorded by the U.S. (18.9%), although Chile had a much lower level of productivity as point of departure. The remaining countries had an

inferior dynamics in terms of productivity, in comparison with that registered in the USA, which resulted in a wider productivity gap with that country. (See Chart 2). The same IDB study indicates that China recorded a 219.4%, Hong Kong a 136.1%, Hungary a 131.9%, and Singapore a 102.8% progress in comparison with the United States.

It should be underscored that behind these averages there are great differences on the macroeconomic level. A duality in the economy persists and it is translated into productivity gaps among enterprises and industries, or among sectors and regions in the countries.[8]

CHART 2
Productivity growth in Latin America and the Caribbean compared to the United States



Source: Pages, IDB, 2010 p. 42.

In summary, as it has been observed, Latin American and Caribbean economies have had a reduced dynamics of economic growth over the last 21 years, particularly in the smallest and largest countries (although Brazil's performance has really improved over the last few years, unlike Mexico's). Also, the productive structure has changed in benefit of the service sector, which shows a pretty negative performance in terms of productivity. This change is probably due to the fact that the service sector has become a recipient for informal employment in low value-added activities. Hence, despite the modernization the service sector might have gone through in financial intermediation, transports, and telecommunications, and despite the establishment of new service niches, such as business services, all of this has not managed to offset the performance of the large sector of low productivity services. Without a doubt, the minor role of the primary and secondary sectors, and the substitution of workforce by new technologies used in agriculture and manufacturing have contributed to this outlook.

8 For instance, in 2003, in Mexico, labour productivity in a large enterprise was four times higher than that of a small enterprise (Brown & Domínguez 2010).

1.2 Foreign trade, exports specialization and levels of technological sophistication

In the period 1990-2000, Latin America and the Caribbean recorded a 8.1% average annual growth rate (AAGR) of exports, however, it shrank by half (4%) between 2000 and 2011. The export's dynamics was higher in the first period because it coincided with a boom in the North American and European economies, but it considerably declined in the following decade because of the 2008-2009 recession and economic crisis. Nonetheless, in the Southern Cone, several countries had a positive performance in exports to China during the second period.

Although exports dynamics in Latin America and the Caribbean has been outstanding, imports have sharply grown, even more than exports, as shown in Table 3 (data for the Caribbean are incomplete). Such phenomenon is a reflection of the globalization process of Latin America and the Caribbean, based on the fragmentation of the productive processes of the large transnational enterprises; and trade openness that has reduced transaction costs and has also fostered the search for external suppliers in countries with lower costs. This situation has generated a growing trade of intermediate goods, which at the same time has translated into the disintegration of productive chains in the countries, especially in those countries that had been able to build up an industrial sector. Besides, imports of final consumer goods rose.

TABLE 3
Exports and imports: 1990-2011

	AAGR Exports %			AAGR Imports %		
	1990-2000	**2000-2011**	**1990-2011**	**1990-2000**	**2000-2011**	**1990-2011**
Latin America and the Caribbean	8	4	5.9	10.4	6.2	8.1
Latin America	8.1	4.2	6	10.5	6.3	8.3
The Caribbean	5	....	....	6.4	5.7	5.7

	Exports/GDP % 1990-2011	**Imports/GDP %** 1990-2011
Latin America and the Caribbean	20.3	19.5
Latin America	20	19.3
The Caribbean	49.4	40.8

*The Caribbean up to 2008
Source: http://websie.eclac.cl/sisgen/ConsultaIntegrada.asp

The very small countries are the most export-oriented, that is, the highest export ratio to GDP (34.4%),[9] exceeding the average for Latin America (20.3%), however they recorded the lowest exports growth rate (4,4%) in comparison with the other groups of countries (See Table 4).

9 Belize has a 62% export-orientation, Paraguay (66%) and Trinidad and Tobago (52%).

TABLE 4
Latin America and the Caribbean. Economic performance indicators: GDP / External Trade Ratio according to the countries' size 1990-2011

	AAGR/ GDP	AAGR/ EXP	EXP/ GDP	AAGR/ IMP	IMP/ GDP
Very small	2.6%	4.4%	34.4%	6.0%	50.3%
Small	4.0%	7.2%	21.0%	6.3%	38.3%
Medium-sized	4.2%	7.2%	28.1%	10.0%	20.2%
Large	2.9%	7.3%	16.6%	9.0%	17.0%
Latin America and the Caribbean	3.2%	8%	20.3%	8.1%	19.4%

Source: http://websie.eclac.cl/sisgen/ConsultaIntegrada.asp

Small countries' exports increased by 7%, with a 21% export orientation (Table 4). This group includes successful exporting countries like Costa Rica, El Salvador and the Dominican Republic, which have *maquila* enterprises; and Uruguay, with meat and dairy products.

On the contrary, the medium-sized group of countries, which includes Venezuela, Colombia, Chile, Peru, and Argentina, features very high GDP growth (4.2%), and a 28.1% export orientation. These countries export mostly natural resources-based products. The group's most export-oriented countries are Chile and Peru.

Finally, Brazil and México record the highest growth in exports, but a relatively low GDP growth.

A considerable portion of exports, in particular manufacture exports, has been highly correlated to imports. The region's average ratio of imports to GDP is 19% in the corresponding period (Table 4). Imports increased an average of 8.1% between 1990 and 2011, with the smallest countries featuring the most reduced growth (6%), and the medium-sized countries featuring the highest growth rate (10%) (Argentina, 12%, and Chile, 10.4% stand out within the group). It seems that there is a correlation between the countries' size and the imports ratio. The smallest countries record a 50% average ratio, followed by the small countries with 38%, the medium-sized countries with 20%, and the largest economies with 17%. Nevertheless, only a small group of countries feature a ratio of imports to GDP below the average, outstandingly, Brazil (11%), Cuba, Colombia (17%), Venezuela, Argentina and Peru (18%). At the other end of the spectrum are Mexico (22.3%), Chile, Uruguay, Ecuador (27%) and the Central American and Caribbean countries (77%). As shown in Table 4, in the three groups of countries the ratio of imports to GDP is higher than the ratio of exports to GDP; therefore, there is an external deficit in most part of the countries.

Two important aspects concerning the development strategy of Latin America and the Caribbean during the last two decades should be analyzed: composition and destination of exports (Table 5). As for the composition of their exports, it is mostly based on their natural resources: extractive and agricultural industries that in the last years have gained increasing demand from Asia. Out of the total Latin American and Caribbean exports, 39% come from primary products, and 19% come from natural resources-based manufactures (altogether they make up almost 60% of total exports). Low and medium-

technology manufacturing exports represent 7% and 20% of total exports, respectively. Only 10% are high technology exports.[10]

When identifying the countries with the highest percentage of primary products in total exports (59% on average), it can be noted that medium and high technology are hardly relevant, with the exception of Argentina and Brazil, whose exports of medium technology represent 22% and 19% of total exports, respectively (See Table 5). The reduced percentage of Brazil's high-technology exports (4%) should be toned down in light of its exports in the aeronautical industry. In contrast, the remaining countries' exports of low and medium technology products account for 48%, while exports of high technology products account for 16%. The former featuring some exceptions based on subassemblies and complete assemblies with high imports content. This strategy has been adopted by Mexico, Costa Rica and Panama in the case of high technology.[11]

As for destination of exports, the United States ranks first with 35% of exports and a predominance of low, medium, and high technology manufactures. The Asian countries rank second (27%), which mostly receive primary products exports, followed by the Latin American and Caribbean region (19%), with a combination of natural resources-based manufactures and medium and low technology manufactures: Next comes the European Union (12%), with exports of primary products, medium technology manufactures and natural resources-based manufactures.

TABLE 5
Exports by destination and type of product of Latin America and the Caribbean
Millions of dollars

	LAC	U.S.	EU	Asia	China	Japan	Total	Avg.	1	2
Primary Products	44704	82999	59825	103198	57877	18941	374766	39%	59%	17%
Natural resources-based manufactures	40610	40255	26916	33847	19316	2737	185578	19%	23%	22%
Low technology manufactures	23357	31411	4861	2590	923	179	64848	7%	5%	21%
Medium technology manufactures	58673	101178	15025	10142	3174	1461	196264	20%	6%	21%
High technology manufactures	15146	68581	5454	3954	1420	578	99829	10%	1%	13%
Other transactions	2453	10336	3559	366	200	20	42472	4%	6%	6%
Total	184808	334716	115081	153882	82771	23918	961680	100%		
	19%	35%	12%	16%	9%	2%	93%			

Source: http://www.cepal.org/comercio/SIGCI/

1: Countries whose primary products exports account for 40% or more of total exports: Guyana, Saint Vincent, Argentina, Honduras, Brazil, Uruguay, Nicaragua, Venezuela, Belize, Paraguay, Ecuador and Bolivia.

2: Countries which export less that 40%: Saint Kitts, Cuba, Antigua, Barbados, Panama, El Salvador, Dominica, Haiti, Mexico, Bahamas, Costa Rica, Dominican Republic, Grenada, Trinidad and Tobago, Chile and Guatemala.

10 Four percent of total exports are referred to as "other transactions".

11 It seems that the cases of very small economies with exports of high and medium technology are atypical, given the presence of one or two subsidiaries of transnational enterprises producing or assembling a certain component.

It can then be asserted that Latin America and the Caribbean recorded a variable performance in the external sector over the period 1990-2011, featuring great dynamism in their exports during the first decade and a deep slowdown during the second decade, with imports showing the opposite scenario. This situation, in addition to an imports ratio higher than the exports ratio in three out of four groups of studied countries, results in a negative external deficit for most part of the region. The smallest countries are the most vulnerable regarding these indicators. Another factor that should be taken into consideration is the exports specialization, featured by most part of the countries. This specialization focuses on the sector of raw material and raw material intensive products, in other words, low technology products, followed by medium-low technology products, with a reduced focus on the high technology segment.

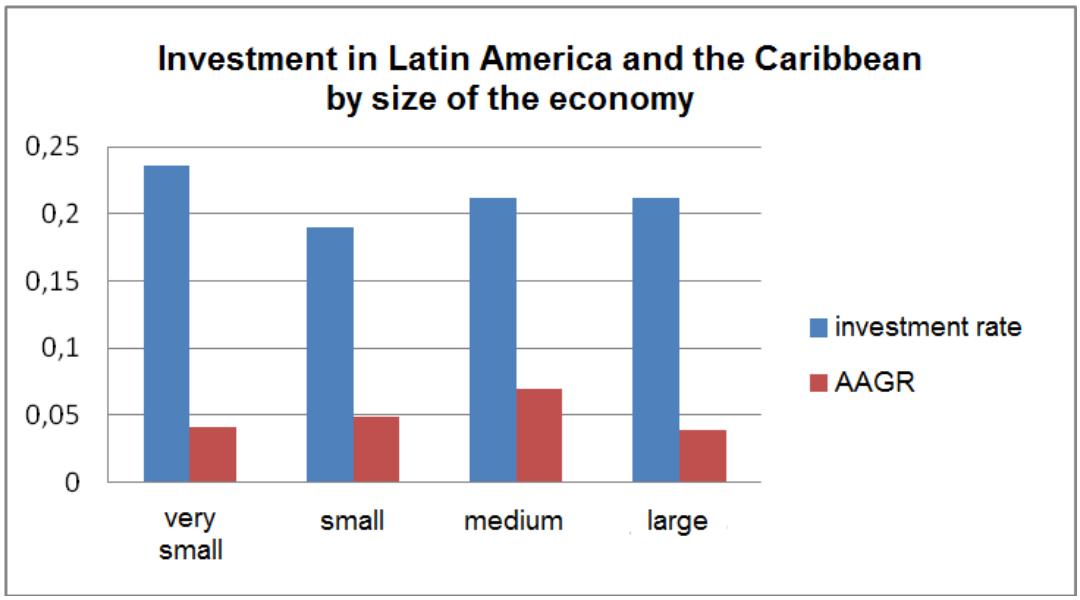
1.3 Indicators on investment capacity and technological progress in Latin America and the Caribbean

On average, in the period 1990-2011, the investment to GDP ratio of Latin America and the Caribbean was 21%. However, this rate was lower in comparison with the rate registered in the region between 1960 and 1970 when it hit about 25%. The fall started with the debt crisis and apparently it hit rock bottom in 1990, with a 19.5% investment rate, bouncing back to reach a 23.2% rate in 2010. Therefore, investment registered a higher growth than GDP, as shown in CE variable in Chart 3. The medium-sized countries reached the highest annual growth rate of investment (6.9%), followed by the small countries (4.9%).

As stated by Katz (2007), the Achilles heel of Latin American economies is precisely the low relative level of productivity and the fact that the pace of technological change is neither enough, nor properly distributed throughout the productive structure (regions, types of enterprises, industry sectors) to allow that the economy's average productivity as a whole progressively approaches to that of the developed world.

As it will be noted, the most important difference between East Asia's and Latin America's successful experiences is that the first ones managed to accomplish a clear transition towards the capacity to generate knowledge, whereas this process has fallen behind in Latin America.

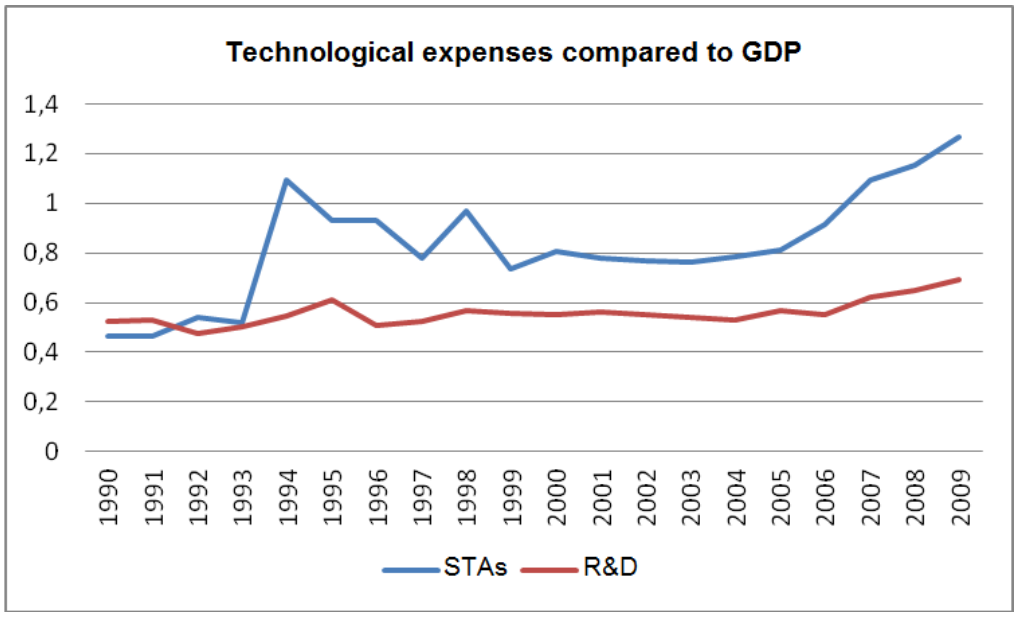
CHART 3
Investment in Latin America and the Caribbean by size of the economy



Source: *http://websie.eclac.cl/sisgen/ConsultaIntegrada.asp*

The expenditure of Latin American countries on R&D activities has been traditionally low (See Figure 4). Only Brazil reached 1.1% in 2009, followed in the distance by Argentina (0.5%), Uruguay and Mexico (0.4%) (Ricyt 2001). In contrast, Spain spends 1.4% of its GDP, Canada 1.9%, and the United States 3% (ECLAC 2007).

CHART 4
Technological expenses compared to GDP



Source: RICYT, Ibero-American and Inter-American Network on Science and Technology. 2001.

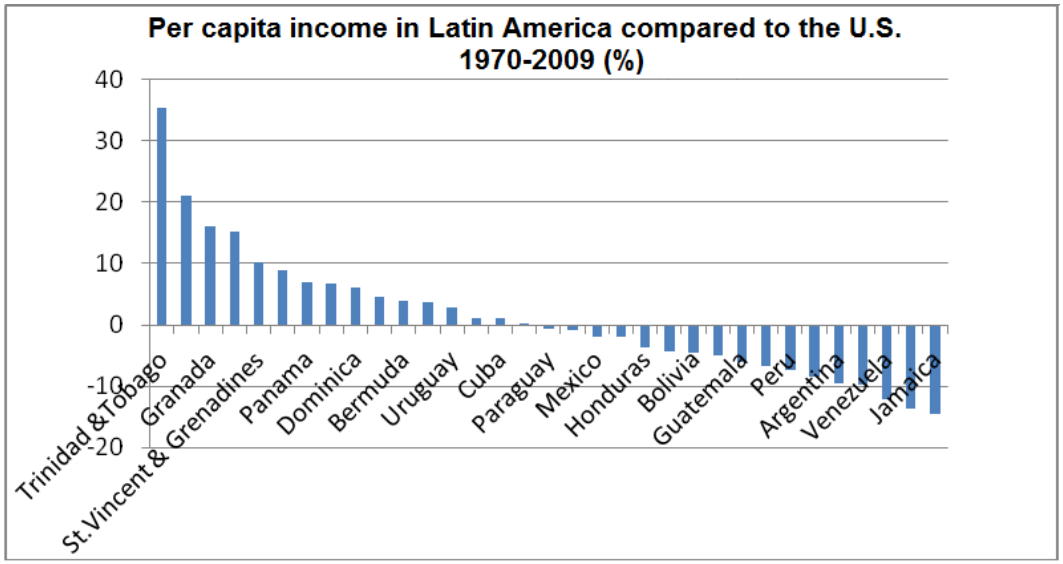
The new model favoured the importance of technology in Latin America and the Caribbean over efforts to adapt and generate technology to the extent that even

laboratories or divisions in charge of technological tasks within public or private enterprises were dismantled or sold to public or private enterprises.

As Katz (2007) remarks, technological efforts in Latin America and the Caribbean do not have a scale or depth – in both terms of "levels of inventiveness" and the amount of resources firms allocate to that purpose – allowing to state that the region's enterprises are truly interested in exploring the universal technological frontiers, seeking for processes or products in that area, and allocating the required amount of resources to that purpose. The causes of this little inclination towards innovation are found in the lack of an adequate incentive regime and in the absence of public goods and public-private coordinating efforts that motivate the private sector to go in that direction (see Chapter 4).

As a result of the previously analyzed phenomena, it can be noted that per capita income of Latin America and the Caribbean accounted, on average, for 25% of the US' per capita income in 2009 (Chart 5). When comparing per capita incomes throughout the recent period, no approach to the US' figures is registered either between 1970 and 2009: the average strayed -1.2% from that country's per capita income. The countries that approached the US the most were Trinidad and Tobago (35.4%), Grenada (16.1%), and Antigua (15.3%). The greatest decreases occurred in Jamaica (-14.5%), Nicaragua (-13.5%), Venezuela (-12.1%), and Argentina (-9.5%).

CHART 5
Per capita income in Latin America and the Caribbean compared to the U.S. 1970-2009 (%)



Source: http://pwt.econ.upenn.edu/php_site/pwt_index.php

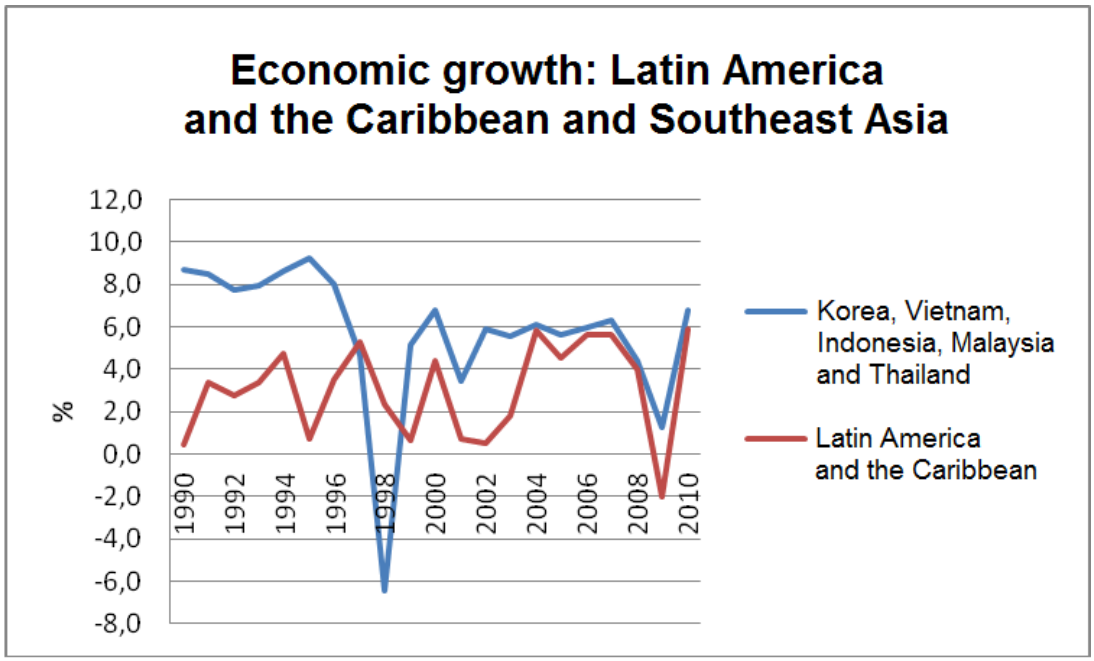
In short, the slowdown in the investment rate in Latin America and the Caribbean, alongside their low investment on STAs and R&D have contributed to backwardness in productivity in most of the region, which also leads to an increasing deficit in per capita income between the studied countries and the developed countries, such as the United States.

1.4 Comparison between the change in the productive structure in Latin America and the Caribbean and that of other regions of the world, especially Asian countries

The economic performance of Latin America and the Caribbean, measured in terms of GDP growth has been deficient in comparison with the economic performance of China, India, and some countries in Southeast Asia like Korea, Malaysia, Indonesia, Thailand, and Vietnam (5.7%), despite the fact that these countries suffered a major downturn in 1997: the Asian economic crisis, which they recovered from pretty quickly. Later on, these countries were less hit by the 2008-2009 financial crisis than Latin America and the Caribbean (Chart 6).

Using five countries of different size in Southeast Asia as references, we note that structural change has been different to that of Latin America and the Caribbean. In Southeast Asian countries, the economic growth was accompanied by a high rate of investment (30.6% of GDP); whereas the rate of investment in Latin America was lower by nine percentage points. An important feature for the selection of countries in Southeast Asia was the increase by five percentage points, from 22% to 27%, between 1990 and 2010 in the share of the manufacturing sector in GDP, in addition to a 6.3% manufacturing GDP growth rate. In short, while Latin America and the Caribbean suffered a deindustrialization, the opposite occurred in these Asian countries.

CHART 6
Economic growth: Latin America and the Caribbean and Southeast Asia



Source: http://databank.worldbank.org/ddp/home.do

TABLE 6
Economic performance indicators in selected Southeast Asian countries: 1990-2010

	AAGR/ GDP	Manuf./ GDP	AAGR/ Manu	F.Cap/ GDP	Imp/ GDP	AAGR/ Imp	Exp/ GDP	AAGR/ Exp
Korea	5.4	27.34	6.4	32.3	35	9.1	36.6	12.3
Thailand	4.8	32.16	6.4	30.9	54.6	5.6	57.1	7.8
Vietnam	7.3	17.88	9.8	30.1	60.6	15.5	52.9	15.9
Malaysia	6.1	27.85	6.2	28.7	88	8.0	100.7	8.0
Indonesia	5	25.71	5.2	26.6	27	6.1	30.9	6.5
Weighted average	5.3	27.3	6.3	30.6	42.4	8.2	45.2	10.4

Source: http://databank.worldbank.org/ddp/home.do

A second feature taken into account was the leadership in exports orientation (on average, 45.2% of GDP between 1990 and 2010), with a 10.4% annual growth. Their imports level grew sharply, but they reached a lower rate (8.2%) and 42.5% of GDP on average. In other words, the imports ratio remained lower that the exports ratio. This suggests a greater share of their exports in GDP, especially in manufacturing, which is the base of their exports (Table 6).

In these countries' case, the importance of the manufacturing sector is one of the main causes of the rise in productivity, given both its intrinsic effect and its steady capacity to generate employment. The study conducted by ECLAC (2007) remarks that the "catching-up" process in terms of the industrial sector productivity has been deeper in Asia than in Latin America and the Caribbean. The same authors point out that given the fact that in Asia the commercial services sector manages to increase its labour productivity, without much growth in the volume of employment,[12] it generates a virtuous circle between the growing industrial dynamism and the modernization of the service sector. This outlook contrasts with that of the service sector in Latin America and the Caribbean, previously analyzed. Indeed, according to a study by the IDB (2010), in Asia, the productivity of the service sector recorded a 2.4% growth rate between 1975 and 1990, and a 2.5% growth rate between 1990 and 2005, whereas in Latin America and the Caribbean, the corresponding rates were -1.8% and 0.1%, respectively.

In other words, in Asia, the industrial sector performs a qualitative and quantitative function: the enterprises bridge the productive gap and gain external competitiveness, which allow them to export increasing added value products and generate a significant number of good quality jobs. Under these conditions, the industrial wage bill expands the domestic market and supports the dynamics of the service sector. In Asian economies, tertiarization complements the industrialization process, to the extent that these economies remain focused on the industrial sector. On the contrary, in Latin America and the Caribbean, increasing tertiarization is translated into the incapability of the manufacturing and primary sectors to reach adequate competitiveness and markets.

The question is: Could the Asian countries' success be replicated? After a diligent analysis on the Asian success, several authors (Pérez 2010; Katz 2007; Hobday 2011) reply that there is a reason why there are not either unique or universal models or recipes that can be followed. Each country must establish its own development agenda based on its

12 However, they make clear that this increase is lower than the increase in industrial productivity.

natural resources, participation in new productive niches in the industry, its institutional framework, and according to its level of development and capabilities.

2. Regional Integration

2.1 Intra-regional trade and productive integration

The outlook presented in the previous section leads to the search for "new ways" of productive development. One could be greater integration between Latin American and Caribbean countries. The present conditions are very conducive to that: not only is there a revolution in information technologies and telecommunications, as well as in transportation, but Latin America and the Caribbean have a much more solid market, which could be a destination for the region's production much more so than up to now.

In fact, the region has strengthened its domestic market through the expansion in absolute and relative terms of its middle class. According to a recent study by Franco, Hopenhayn, and León (2011) covering ten countries in Latin America and the Caribbean (including large, medium, and small economies) which account for 80% of the total population of the region, the number of middle class homes increased by 56 million between 1990 and 2007. In Brazil, for example, the number of persons in that social level went from 23 to 61 million between 1990 and 2007. The study also found that within the middle class of the countries studied, there has been an increase in the number of families in the lower middle class that rise to a higher middle class. More than half of the population belongs to this social group in countries such as Chile, Brazil and Mexico, according to a study by the OECD (2008).

Although not completely consolidated,[13] this sector is a new and dynamic market niche for the consumption of local and imported goods and services, and with increasing sophistication, which is encouraging for the region's productive sector.

On the other hand, a greater cooperation between Latin American and Caribbean countries in a range that goes beyond trade seems more urgent than ever, since changes in production systems, which are increasingly high tech, fragmented and globalized, pose significant challenges that these countries have not been able to face properly. It is very likely that they may face this challenge more effectively if they cooperate and coordinate to jointly reach more sophisticated levels of production.

The idea that the economic integration of Latin America and the Caribbean may help the economic and social development of their countries dates back to the 1960s. During the six decades in which regional and sub-regional integration schemes were applied, two stages can be distinguished: the old regionalism, and the new regionalism (Giordano and Devlin 2011) Ocampo, 2001). Old regionalism was promoted in the 1950s and 1960s, when the norm was national protectionism to achieve the industrialization of the region's countries, and the insertion of manufactured products in the international market. Having agreements to mutually reduce tariffs between the region's countries would facilitate the diversification of production and exports, while taking advantage of the economies of scale. In this first stage, however, there were no significant advances in the commercial integration between the countries, even less in production integration, although the

13 This middle class is still vulnerable, since a significant portion is underemployed in the informal sector, so it isn't fully covered by social protection, and doesn't have the proper education levels. The middle class in Argentina, Chile, Ecuador and Peru have on average eight to ten years of schooling, and in Mexico, 7.6 years. Very few have university degrees (OECD, 2008).

creation of the MCCA in 1960 did achieve some integration, since it included small and geographically close countries, and had some international cooperation.

It was the trade opening in general, including that within the region particularly since the nineties, which drove intra-regional trade and generated a "new" type of regionalism, originally called "open regionalism" by ECLAC. This approach, besides striving to have a closer economic relation between the member states of the different agreements, hoped that by doing it in a situation of greater openness towards third countries, and a greater deregulation, would reduce transaction costs and improve the competitiveness of their exports worldwide. This perspective included a transformation of production with equity, stressing technological innovation and its transmission to the region, to help foster economic growth and improve the social conditions of the poorest sectors (ECLAC, 1994).

Trade liberalization, whether through regional and sub-regional integration agreements, FTAs, or unilateral openings due to multilateral trade commitments (mainly with the WTO), resulted in a great increase of exports, including those destined to the region itself. The latter reached somewhat more than 20% of their total trade in the beginning of the 1990s[14] (compared to 15% in the 1980s) and at the sub-regional level it was more intense, reaching 25% in MERCOSUR and MCCA during that period. This last percentage is similar to that obtained by the Association of Southeast Nations between 2006 and 2009 (ECLAC, 2011). In their transit towards a greater regional opening, there have been exchange imbalances, and global financial crises which have affected the liquidity of the countries in the region, among other factors, so the path towards openness has not been linear.

There have been efforts complementing the trade opening in Latin America and the Caribbean, particularly those intended to facilitate trade through investments in physical infrastructure[15] and the simplification of customs procedures (the establishment of Single Windows for foreign trade, the automation of customs procedures, among others). DFI also flowed to the countries to take advantage not only of a cheap labour force, but also of the FTAs with the US that facilitated access to that market.

There are at least three characteristics to note in intra-regional trade. First, among the main exports are those from the automotive industry (passenger and transportation vehicles, as well as auto parts), chemicals, plastics, petrochemicals, electronics (ECLAC, 2009). In 2008 more than 80% of the intra sub-regional trade between MERCOSUR, CAN, CACM and CARICOM were manufactured products, and around one fourth of the exchange of products between three sub-regions, MERCOSUR, CAN and CACM, was a reflection of the intra-industrial trade between multinationals. This is the case of the most important sectoral trade, the automotive sector, and maybe a significant portion of the trade of chemicals and pharmaceuticals. This intra-regional trade is at least partially a reflection of a value chain of large multinationals within Latin America and the Caribbean, which is incomplete *per se*, since the links that correspond to the most sophisticated technology are outside the region.

Second, this type of trade offers SMEs opportunities to expand within regional markets, where they already have a greater participation than in the markets of third countries. These enterprises export products from the food, beverage, and tobacco sectors, chemical products, metal-mechanics, among others. SMEs have a diversity of exports and

14 Since then, the share of intra-regional trade has dropped in the total, but not significantly (18.2% between 2005 and 2007).

15 The projects of the South American Regional Infrastructure Integration Initiative (IIRSA) and the Mesoamerica Project are important for the development of the physical infrastructure.

are not labour intensive, so they help meet the most diverse and inclusive development goals. However, SMEs that can export at all are still a small proportion of the total.

Third, there is a significant trade exchange of raw materials or natural resource intensive products within the region, among them gas, crude oil, non-milled wheat, soybean oil, soybean cakes, copper and its alloys, steel ingots and bars, soy beans, alloys, among others. This characteristic shows that Latin American and Caribbean countries depend on each other to supply themselves of raw materials and food, essential for their production and food security. Incorporating more added-value to these products could help strengthen the production density of the region.

There are production integration initiatives in the subregion that could be an important benchmark for the whole region. Such is the case of the Production Integration Program of MERCOSUR of 2008.[16] It includes programmes to develop suppliers in the oil and gas sector for the Executive Group for Automotive Chain Production Integration. (GEIPA), the Program "Tourism Routes", the MERCOSUR Programme of Business Articulation for Production Integration, the naval sector, and the MERCOSUR Competitiveness Forum on the Audiovisual Productive Chain.

The purpose of this programme is to jointly develop new competitive advantages based on the complementation between Member States, deepening specialization within sectors. It also grants importance to the integration of SMEs in general and of enterprises in small economies in particular, into regional production processes, trying to reassign production resources to reach their objectives.

Thus, the regional policy should focus not only on reducing transaction costs and coordinating the supply of regional public goods (infrastructure R&D, and financing, among others),[17] but also in specific programmes to generate regional value chains in some particular sectors.

2.2 Winners and losers; policies to reduce asymmetries

Latin America and the Caribbean is the most unequal region in the world, according to the Regional Report on Human Development for Latin America and the Caribbean, 2010, of the UNDP. Although poverty has decreased in almost all the countries, and the Human Development Index (HDI) has improved, inequalities within and between countries remain or are getting worse.

Since the creation of the Latin American Free Trade Association (ALALC) in 1960, which became ALADI in 1980, the goal has been to reduce asymmetries through a greater integration of the region. For a long period in the last 50 years, integration has been conceived mostly as an increase in trade exchanges, which has come together with an insufficient stimulus for production and job creation. Even trade exchanges have been asymmetrical between some of the most advanced and the least advanced countries of the region, with significant trade deficits for the latter with respect to the former (for example, Honduras and Nicaragua with Costa Rica, and Guatemala within the CACM; and Paraguay and Uruguay with Brazil, and Argentina within MERCOSUR).

There are some positive signs. For example, there is technological improvement in products and some services traded between some of the more developed countries and

16 MERCOSUR/CMC/DEC. Nº 12/08, on line, http://www.sice.oas.org/trade/mrcsrs/decisions/dec1208s.pdf

17 Ibid.

others not as developed within the region, as a result of investments made by companies from the former group of countries in the second group, in the area of services or parts production for their main offices. This process is driven mainly through investments within the region itself (trans-Latin companies) or from multinational investors that establish plants in the region's countries, including some of the poorest ones (textile *maquilas* in Honduras, for example).

However, a specific effort to include the most disadvantaged countries into regional production integration schemes would be a valuable complement to overcome the aforementioned asymmetries.

There is a programme that has been specifically designed to that end: the Fund for Structural Convergence of MERCOSUR (FOCEM) (Decision 18/05, 2005). Its purpose is to reduce the asymmetries between the different Member States, so that the benefits of integration are more equitably enjoyed. This initiative is responsible for financing projects that benefit the growth of the more undeveloped regions in MERCOSUR.

FOCEM will remain in force for 10 years, during which the Member States must contribute 50 million dollars the first year, 75 million the second year, and 100 million dollars from the third year onwards. Contributions must be differentiated, according to the level of development of the country, and their use is also defined in this way: (a) Contributions: 27% Argentina, 70% Brazil, 1% Paraguay, and 2% Uruguay; and (b) resources are non-reimbursable, and each country has defined its access to the funds, thus: 48% Paraguay, 32% Uruguay, 10% Argentina, and 10% Brazil. The project areas are: Structural Convergence Program; Competitiveness Development Program; Social Cohesion Program; and, Program to Strengthen the Institutional Structure and the Integration Process (FOCEM, 2007).

The other subregional integration agreements, the Andean Community (CAN), the Central American Integration System (SICA) and the Caribbean Integration Agreement (CARICOM) have expressed their concerns regarding regional inequalities, and have had several types of integration programs. The sub region also had the support of the European Union (EU), the Inter-American Development Bank (IDB), and CAF-Development Bank of Latin America, among others, but these programs have focused mostly on facilitating trade, in some cases social development and environmental protection, but not so much on productive integration. (SELA, 2011; ECLAC, 2009).

These measures for trade facilitation, along with programs for multiple-type interconnection, are certainly very important for integration of production of tangible and intangible goods. Mention must be made of the achievements under the Mesoamerica Project (MP). This project includes the Mesoamerican Road Integration Corridor, on the Pacific side (where 95 percent of the land freight is transported), the Electrical Interconnection System for Central America (SIEPAC), plus the electrical interconnections between Panama and Colombia, and between Guatemala and Mexico; and the Central American Optical Fibre Network (REDCA), which will help build the Mesoamerican Information Highway (AMI), among others.

It is important to note that some land border regions between Latin American countries have the highest levels of poverty and marginalization. Frequently, there are indigenous people with little access to utilities and formal work, particularly in remote areas (Martínez-

Piva and Cordero 2009). There are some border development programmes in force in the region, reflecting the concern that some countries have about this issue.[18]

It is necessary to think about non-traditional activities in border areas that may be financed through regional and international funds. Considering that border areas are usually very rich in natural resources, particularly forests, programs could be designed for the production of environmental services. This could solve some sustainability problems, while the population in those areas could obtain jobs protecting those resources (forest protection programs for CO^2 recapture, reforestation, sustainable forestry, etc.). Another source that could have a more significant role is eco-tourism in remote areas where employment is scarce. One such initiative was adopted in 2003 (it should end in 2013) by the Central American Council on Tourism (CCT), as part of the Central American Integration System (SICA), with the approval of the "Strategic Sustainable Tourism Development Plan of Central America", which implied taking joint integration actions in planning, product development, training and institutional strengthening. Many Latin American and Caribbean countries, as in the case of Central America and the Caribbean, are rich in biodiversity, with large forests, water bodies, among other natural resources that may offer a series of activities and jobs, which used sustainably, may create additional wealth for those countries.

2.3 Trans-Latin companies

The increasing investment flows (FDI) originating in and destined to Latin America and the Caribbean have been a significant way to connect countries. Improvements in business, finance, and service networks among others, have led to a *de facto* integration between several countries in the region.

The dynamism of these flows has been exceptional, reaching 43 billion dollars in 2010, that is, 10% of the total FDI that the region received that year (ECLAC, 2010). A significant part of this FDI has been through mergers and acquisitions, and many have been between neighbouring countries, which gives an idea of the function of this FDI in regional integration. 47% of the total mergers of Latin American and Caribbean enterprises were with companies of the same region, and more than 50% of the investments in new trans-Latin facilities are also in the region.

The investments of trans-Latin companies have been mainly in basic industries: hydrocarbon, mining,[19] cement, cellulose and paper, and steel. There were also significant investments in food and beverages, and some public services such as

18 A recent SELA document (2011) mentions the following border programmes: Binational Development Plan of the Border Areas Ecuador – Peru; Cúcuta/Villa del Rosario – San Antonio/Ureña, in the Colombian-Venezuelan border; Plan Trifinio, between El Salvador, Guatemala and Honduras; Border area integration Brazil – Uruguay; border area integration between Costa Rica – Panama.

19 For example, Votorantim Metais Lmtda of Brazil acquired Cía Minera Milpo SA of Peru in 2010, and Río Tinto ALCAN of Brazil is planning to build an aluminium plant in Paraguay for US$ 3.5 billion by 2014, which would be one of the largest investments that the country has ever received (it would produce 670,000 tons of aluminium per year) (América-Economía).

telecommunications[20] and energy,[21] and others like the financial sector,[22] air transportation[23] and trade, like supermarkets.

The role of Latin American companies in infrastructure is very relevant[24] although usually is not an investment of the companies themselves[25] but of the governments, whether of the country where the work will be done, or the governments from where the companies originate (for example the 1.0 billion dollar loan that Brazil gave to Panama to build the Panama City Subway). The logistics platform that facilitate the transport and trade of merchandise, like the expansion of the Panama Canal, and Uruguay as a regional logistics platform, have marked a milestone in the capacity of some countries to enter massively into the international market with their products (ECLAC, 2010). Also very important is the investment in energy between the region's countries, for example the financing of investments in biofuels made by Brazil to other countries in Latin America and the Caribbean (for example, BNDES of Brazil authorized credits to produce biofuels in Paraguay for 22.10 billion dollars in 2011).[26]

Although still incipient, it is important to mention that trans-Latin companies have started operating in the software sector. In 2010, 10 out of 102 companies that invested in new software projects in the region were trans-Latin companies. Among the companies in Latin America and the Caribbean with investments in the region are SOFTEK of Mexico, Sonda of Chile, GLOBANT of Argentina, and TOTVS of Brazil (ECLAC, 2010). Finally, we must highlight the segmentation of some services, whose productive chains have relocated in different parts of the region, for example cultural services like the movie industry of in Mexico that frequently sends to Argentina or Chile some production processes that are too expensive to produce in that country (Martínez-Piva, Padilla, Schatan and Vega 2010); or the data processing services that public or private enterprises (banks, Ministries, etc.) send to other countries in the region where they are less expensive.

This dynamic movement of investments and credits between Latin American and Caribbean countries are undoubtedly a sign that the region is becoming integrated and consolidated in several areas, and that it is capable of generating its own projects and finance them within the region, making it less dependent on foreign resources. It is important to mention that these regional flows benefit the larger economies the most, but also the smaller ones are entering the scene as credit recipients from the region's larger countries.

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20 In 2010, the telecommunications company DirectTVLatinAmerica LLC of Mexico acquired the company Sky Brazil (ECLAC, 2010).

21 In 2010, companies in the energy sector were purchased, for example DECA II of Guatemala by the Colombian company EPM (ECLAC, 2010).

22 Banco Bradesco of Brazil acquired IBI Mexico in 2010 (ECLAC, 2010).

23 Tam and Lan Chile, 2011.

24 Odebrecht of Brazil, and ICA of Mexico in Panama, for example. (http://www.taringa.net/posts/noticias/3213105/Brasil-ofrece-credito-para-construir-Metro-de-Panama.html).

25 However, mergers and acquisitions of companies in Latin America must be mentioned. For example, in 2010, Cintra Concesiones de Infraestructura de Transporte of Chile was acquired by Interconexión Eléctrica SA of Colombia.

26 http://www.wwe.paraguay.com/internacionales/brasil-invierte-en-potenciar-los-biocombustibles-71653

In order to guarantee the proper performance of trans-Latin companies, the region must improve its institutional framework, for example, competitiveness. There are cases of companies that have monopolistic behaviors (for example, telecommunications, cement, and airlines, among others) and countries individually cannot control this situation, so a greater cooperation between the region's institutions on trade and competition could be very useful for the interaction through regional or international FDIs to be beneficial for Latin America and the Caribbean (Rivera and Schatan, 2008).

Although this section has focused on trans-Latin companies, the FDI coming from outside the region (90% of the total FDI) has a significant effect on regional integration. Frequently, multinationals invest in more than one country in the region, and thus a relation is established between them. It has already been mentioned that the automotive industry has already established a value chain among the different plants in different countries. There is also a trend for large companies to become conglomerates and operate in different countries as well as in different sectors. An example is the agreement between IBM and EBX of Brazil to purchase 20% of one of its suppliers, SIX Automacao (specialized in mining, hydrocarbon extraction, and shipyards). IBM will help generate integrated operations in oil and gas, with the purpose of increasing the life of oil reservoirs, and reducing costs, and will also create a new technological solutions center for industrial sectors that will serve Brazil, Chile, Colombia and Peru.[27] Even more so, it is betting on Brazil's development potential, since it installed in 2010 its first research laboratory in South America, the ninth of its kind worldwide, in Sao Paulo and Río de Janeiro.

The region's countries need to talk about the role of FDI from third countries, and from trans-Latin companies to evaluate the process of production integration that occurs through them, and the best way to take advantage of their presence (formation of suppliers, R&D contributions, training, etc.)

In sum, regional integration has moved forward, particularly through trade starting in the 1990s, and among the positive aspects is that products with a greater added value are being exchanged compared to those that go to third countries, and there is some room for SMEs to participate in these export activities. Integration mechanisms are now much more diverse as a result of regional and extra-regional investments. Moreover, in some cases progress has been made towards the creation of Latin American production chains, but they are still very incipient. The main actors in this integration process are large Trans-Latin enterprises or multinational corporations, while the participation of SMEs has been limited to intra-regional trade and regional value chains.

This is very good time for the countries of the region to hold a dialogue on their opportunities to achieve further integration in the production sector, considering that their markets have expanded and are considerably more dynamic than those of their developed partners. It would also be worthwhile for them to discuss the role of FDI coming from third countries and Trans-Latins, and the ways to take better advantage of it (training of suppliers, contributions to R&D, capacity building, etc.) so as to encourage productive development in the region. Cooperation between national, regional and international private and public sectors could further strengthen this momentum and contribute to the inclusion of sectors lagging behind (training suppliers, border programmes, among others).

27 biobiochile.clhttp://www.biobiochile.cl/2012/04/12/ibm-se-abre-paso-en-negocio-de-recursos-energeticos-en-america-latina.shtml

An agreement among the region's countries to better guide and regulate the markets in which the region's investors are operating, as well as to generate incentives so that the FDI from the region or from third countries can create new production niches, would help the region make a coordinated leap towards a more sophisticated basket of production and exports.

3. Production development policies in the region

At present, analysts have mentioned the need to modify the meaning and concept of "industrial policy". In the 1980s, the term meant the direct intervention of the State in the economy, and government control of significant parts of the productive apparatus, as well as a set of public actions aimed at limiting the scope of the market. As Bianchi and Labory (2006) state, today, the concept of industrial policy includes a variety of policies applied by several institutional subjects, to stimulate the creation of enterprises, favor their clustering, and promote innovation and competitive development in the context of an open economy. In this respect, it is said that new industrial policies pertain to industrial development, where the industry is considered implicitly as an organization, together with its services, managing human competence and technological capabilities. These policies are dynamic and their programs must evolve in time, according to changes in the economy and in its context.

The new industrial policy lies in the potential of inter-firm cooperation, and the generation of externalities and cluster economies. (Marshall 1890; Krugman 1998; Porter 1990; Brusco 1982; Becattini 1979; Marshall 1919). The implication is that work must be done in the social-relational nature of learning and knowledge. Thereby the importance given to the connectivity and the interaction between economic agents: brokers and intermediaries, business support institutions, business cooperation networks, and government development agencies. All these promote dialog and coordinate cooperation from top to bottom, and from bottom to top (Sepúlveda and Amin, 2006).

The new policy replaces the State as the main actor, and emphasizes the need to have diverse local and federal institutions working together in a less interventionist environment. However, since the State is still the main coordinator and regulator of economic activities, its political will to participate and help is fundamental for this policy to become a reality.

Although the maneuvering margins in Latin America and the Caribbean have decreased in the last 25 years due to the discipline established by international trade codes (WTO among others), there is some space for an industrial policy that has not been used. In this sense (Amsden, 2005) states that maybe the greatest obstacle for growth in the manufacturing sector in those countries whose industrial diversification is stagnated or just beginning, is more a lack of "vision" than the WTO's restrictions. There are some actions that could be used in the policy to promote technological change, environmental care, and regional development. With the same trade rules, the governments of various countries have taken advantage of the available space for a domestic policy of growth and productivity (Mercado, 2011). We must mention the experience of countries in South East Asia, Europe, and even the US government, which planned to spend 40 billion dollars only in its Energy Department, in loans and subsidies to encourage private companies to develop green technologies (electric cars, new batteries, turbines and solar panels).

As we will see later on, several countries in the region are starting to use the space available for action successfully, and we can talk about the implementation of a new industrial policy, incipient in some countries, and deeper in others. Besides the horizontal instruments adopted during the times of the Washington consensus, new production development policies are being implemented, like the energizing, and even re-

introduction of development banks, policies to create suppliers of networks of domestic and foreign producers, SME association programs, and a closer link between the universities and the industry. Also these policies are moving towards forging public-private cooperation and associations, to increase the competitiveness of enterprises. Several countries are making efforts to integrate the region's countries into global value chains.

Last but not least, are the actions that go beyond the borders which focus on economic integration in the Southern Cone and Central America, with increasing exports between the countries, suggesting a great potential for trans-Latin companies to play a more active role in the region's global production integration as was mentioned in the previous chapter.

3.1 Industrial and other production development policies in the 1950s and 1960s

During the 1950s and 1960s, the State assumed a central role in the economy of the region's countries. Following a development perspective (Prebisch 1949; Lewis 1954; Nurkse 1953; Hirschman 1958), it was thought that Latin American countries needed to change their productive structure through industrialization (a process that helped "disseminate technical advances", according to Prebisch) to close the gap with developed countries. According to this perspective, it was necessary to be better inserted in the international market, with a greater added value than that of the primary products in which they specialized, and with better exchange terms than these offered. The industrial sector, particularly manufacturing, was considered the driver of growth, stimulating the expansion of urban centers, technological innovation, and the gradual incorporation of large sectors of the rural population who lived in subsistence conditions, into production sectors with better remuneration.

The goal of this strategy was to change the production structure, using industrialized countries as a benchmark, and for which they would (1) plan the process to transform production; (2) create or strengthen large national companies, many of which emerged through State investments and its properties, and produced intermediate goods essential for manufacturing (steel, cement, chemicals, fuels, among others); (3) protect against imports, so that the emerging manufacturers could develop; (4) generate services and infrastructure to drive this type of development (telecommunications, electric power, roads, etc.); (5) create rules for the incoming FDI, attracted by the expanding Latin American markets, and protected by including domestic components to stimulate local manufacturing and the reinvestment of profits; (6) and finally, at least since the mid-1960s, export stimuli were created, a policy that deepened in the 1970s (and in many cases were still in force in the beginning of 2000).

This phase of the economic development policy entered a crisis in the seventies, and many of its instruments were almost completely abandoned in the 1980s, due to fiscal deficits and foreign debts. Nevertheless, the production structure in many of the region's countries changed during this initial phase. Many companies could not remain competitive during this opening and disappeared, and domestic production was replaced with imports, but the industries that were created during the period of import substitutions still persist, whether in the hands of the public sector or privatized. Those that were able to revamp and modernize themselves are presently very important enterprises, which have contributed to the development of their countries, like Petrobras and Embraer in Brazil, or CEMEX in Mexico, among others.

On the other hand, some sector policies implemented during the 1950s and 1960s didn't disappear completely, and some of them continued. In Argentina, Brazil, and Mexico policies were implemented to replace the import of cars, attracting FDI to the sector and

offering different types of fiscal, tariff, and/or credit incentives since the beginnings of the import replacement strategy.[28] Thus, many plans and policies emerged to develop this sector at the national and sub-regional level: there were agreements to develop this sector jointly within MERCOSUR starting in 1988, in the Andean Community since 1999, and the free trade agreement in the automotive sector between Mexico and MERCOSUR in 2011.

Within MERCOSUR, the more active policies were implemented in the mid-90s, but with constant starts and stops. This has been mainly due to the stimulus policies adopted in Brazil which created adverse reactions from the other trade partners, particularly Argentina, but also due to similar initiatives implemented in the latter country. Also, the asymmetries between MERCOSUR countries and the lack of instruments in the agreement to remedy this situation (or their ineffectiveness) have slowed down the integration process. Similarly, the great exchange problems that the different countries have faced in different times have hindered integration, since the lack of alignment of the exchange rates have drastically altered the competitiveness of the products of some countries in the market of others, and thus, some have obtained a market at the expense of others.

3.2 Horizontal production development policies adopted during the times of the Washington Consensus. Achievements and limitations

Since the 1980s, and particularly as a result of the foreign debt crisis of 1982, economic policies promoted the free market internationally, trade opening, deregulation, the elimination of trade barriers, and the establishment of clear non-discrimination rules in trade, which would consolidate with the creation of the WTO in 1995 (at the end of the nineties, almost all countries in Latin America and the Caribbean were part of the WTO). At the same time, most public sector enterprises were privatized, interest rates and exchange rates were liberated, many central banks became autonomous, and legal limits were established for public deficits.

Horizontal measures, like trade liberalization, and unconditional openness to FDI among others, should have helped lower costs for producers and foster their competitiveness in the domestic and international markets. This process triggered growth in these countries, but without the macro imbalances that had previously caused recurrent delays. Thus, the expectation was that the private sector would control economic activities and growth, while the State would focus on the basic tasks of security, overseeing the law, and the services necessary for the population.

The strategy adopted was summarized into 10 points, and in 1989 Williamson called it the Washington Consensus (Navia and Velasco 2003). This would be the essence of the public policies up to the mid-nineties: fiscal discipline; establish priorities in public spending, supporting the poorest segments in a more focalized manner, basic health and education; tax reforms, expanding the base and with moderate marginal tax rates; liberalization of interest rates; competitive exchange rates; trade openness; liberalization of FDI; privatization; deregulation; and the defense of property rights.

Horizontal economic policies had some tangible impacts on education and health, as mentioned by Ocampo and Ros, 2011, although in the 90s they fell back again. Openness and deregulation didn't have the expected results regarding GDP growth rates, while unemployment and poverty increased. The latter indicator increased from 40.5% to 48.3% of the total population between 1980 and 1990 in the region (ECLAC, 2009).

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28 Argentina promoted the first mixed capital company (domestic and foreign) IAME y Kaiser Motors Corp. in 1955; Brazil had its first automotive program in 1956 through Goal 27 of its Goal Plan; and the first decree in the automotive sector of Mexico was in 1962.

These results led to the adoption of "second generation" economic policies that consisted in a series of institutional changes that would allow "first generation" policies to work properly, including better regulations and laws, including the financial sector, the labour market, the creation of social security networks, and poverty reduction policies (Navia and Velasco, 2003).

These second generation policies had different characteristics in the different countries of the region, but many were repeated in several countries, and were backed by international financial organizations. Among them we can mention an increase in the social spending of governments to support the most vulnerable groups; a competition policy whose mission was to guarantee a truly competitive behavior between market actors; and intellectual property protection laws, to stimulate innovations and guarantee their property. Ocampo and Ros, 2011, consider the reemergence of regional integration agreements as part of these policies since strictly speaking in the eighties it was believed that countries should implement a unilateral openness, with no restrictions.

3.3 Policies to support SMEs

Among the policies that emerged when the Washington Consensus started to fail, was that in support of SMEs. These companies had traditionally been an important job generator: 43.6%, 42.6%, 47%, and 30.8% of the total formal employment in Argentina, Brazil, Uruguay and Mexico, respectively (Ferraro and Stumpo, 2010) and between 30% and 50% of employment in the whole region. (IDB, 2005). The presence of formal and informal SMEs was very high in some countries. For example, they represented more than 90% of the companies in Central America (SICE, SIECA and CENPROMYPE, 2010). The success of the SMEs is considered crucial to prevent the loss of more jobs, to generate new job posts, support the most vulnerable business sector, and fight poverty in the region, among others.[29]

The region's countries could have a more dynamic and inclusive development if their SMEs could have the proper momentum. However, this sector doesn't have the required support in many of the region's countries, as can be seen in the meager national budget they are assigned, 0.1% of GDP in the best of cases (Ferraro and Stumpo 2010). International cooperation has helped significantly to complement budgetary resources for SMEs, as can be seen in detail in a recent document (SELA, 2010). In Paraguay, for example, almost all resources destined to support SMEs come from abroad (Ferraro and Stumpo 2010). However, international funds are frequently assigned in a scattered manner, through different programs that are not coordinated between them, and sometimes, their purposes are not aligned with those of the countries. The fact that support funds come from very diverse sources leads to duplications, inefficient use of the resources, and lack of connection between the supply and demand of financing (SELA, 2010). Thus, a difference hasn't yet been made in the development of this large group of enterprises.

29 In the 1990s and the decade of 2000, a more solid legal and institutional framework was created to support these producers, but they were still very limited to really make a difference in the performance of these enterprises as a whole; nevertheless, the policy has been very dissimilar in the region. For instance, the Brazilian Service to Support Micro and Small Enterprises (SEBRAE), the Corporation for Production Development (CORFO), and organizations such as the National Commission for the Micro and Small Enterprise (CONAMYPE) of El Salvador, and the Fund to Support the Micro, Small and Medium Enterprise (Fondo PYMES), in Mexico, were much weaker. In a third group of countries, Argentina, Ecuador, Paraguay, Peru and Uruguay, efforts to support SMEs have been sporadic and uncoordinated.

Despite all these difficulties, we must not underestimate the development of more promising ways to support SMEs that focus not so much on the individual company, but on it within a *cluster* or production chain, as well as on its technological innovation. This makes such companies connect with others locally, which makes the productive web grow, and also with educational institutions, local governments, and other entities that are close by, which may create a context that fosters the success of the enterprise (Sztulwark 2011). These associations are made effective in joint purchases, joint exports, associations between enterprises to access credit, links associated to subcontracts, etc. (Ferraro and Stumpo 2010). Regarding financial support, new instruments have been created, but significant financing sources were lost due to the reforms in the eighties, and alternative mechanisms have been investigated, as we will see later on.

It is worthwhile to illustrate some of these changes with national experiences:

In Brazil, for example, there are many incentives for SMEs, some of which are relatively new and are directed to innovation and development activities. The "Ley del Bien" (2005) channels fiscal incentives for innovation, benefitting R&D activities implemented by SMEs together with science and technology institutions (Crocco and Santos, 2011). There are also stimuli for innovation, such as funds to promote the relationship between universities and enterprises, and programs to support enterprise incubators. There are others for technical assistance to innovation, and technical and financial support to promote exports from these enterprises. The Brazilian Service of Technical Solutions (SBRT) facilitates access to non-complex technical solutions for SMEs and even for individuals (Crocco and Santos 2011).

In Mexico (Domínguez and Brown 2008), where the Washington Consensus policies were strictly implemented, the industrial policy was replaced with policies supporting the entrepreneurial sector, and financing through development banks decreased significantly. The new policies supporting micro, small and medium enterprises (MSMEs) didn't materialize until 2002, when market failures, unemployment, and inequality appeared in public policy agendas. Within this approach, the initiative to foster productive chains emerged, to favor technology transfer to smaller enterprises, and foster the clustering of MSMEs so they could be more competitive in the markets or in productive chains (Domínguez and Brown 2008).

Mexico's effort to somehow compensate the policies that reduced financial support to MSMEs is noteworthy, particularly facilitating access to credit for these companies. To this end, a National Financing System (SINAFIN) was created, which includes three programs: (a) the National Program of Guarantees, which support SMEs to access credits in the commercial banks; (b) the National Program of Financial Outsourcing, which is a fund that hires financial executives to help SMEs access credits from the financial brokers authorized by the SME Fund; and (c) financing through seed capital schemes (Domínguez and Brown 2008).

The development of SMEs requires an increasing cooperation between them, to develop new activities and products, share computerized systems, achieve economies of scale, and share risks in new investments. Having access to a CIT system allows the establishment of links with other companies at the national, regional and international level, and obtain some benefits from them. An example is the case of the Taiwanese branches in China, which by investing in companies with modern computerized systems, have access to a modern computerized system in their home offices without having to make large investments (Ueki, Tsuji and Cárcamo 2005). According to this same study, there are significant advantages for SMEs to trade jointly, among them the travel sector in Mexico

and Vietnam, knitwear in the Republic of Korea, construction services in Japan, and precious stones in Thailand, among others.

A relevant experience in regional SME support initiatives is the Center for the Promotion of Micro and Small Enterprises in (CENPROMYPE) attached to the General Secretariat of SICA and the Secretariat for Central American Economic Integration (SIECA). The purpose of this regional institution is to "contribute regionally to improve the competitiveness of MSMEs and their access to regional and international markets, fostering Central American integration and the coherence of development policies for the sector". There are interesting projects at CENPROMYPE which could be a reference for other initiatives in other sub-regions of LAC. One is on "Inclusive Chains in Central America and the Dominican Republic" of the productive sector that promotes the creation of quality jobs, gender equality and environmental sustainability. The Project is expected to reinforce the organizational structure of two productive chains in each of the identified border territories: Wood and Furniture, and Community Rural Tourism. Another interesting program is the "Integral Central American Plan for Social Cohesion and Economic Development through the implementation of CITs in Nicaragua and El Salvador" aimed at improving the competitiveness of Central American enterprises, through access, implementation, and use of CITS in business processes.

The growing needs of MSMEs in the region to become competitive in the national regional, and international market require government support so that they can count on the necessary public goods; to develop the ICTs that may support their joint operations and facilitate access to financing those association processes, among other types of support. The possible agreements that could be made sub-regionally or regionally would be very helpful to achieve a more inclusive development and overcome the large inequalities within and between the region's countries

3.4 The re-emergence of development banks

Development banks emerge in the region due to the lack or meager development of capital markets to meet investment and financing requirements in the mid and long term. The crisis of the eighties questioned many import replacement policies, among them the financing programs of development banks, since it was considered that they interfered with market operations. Specifically, they were considered an obstacle for the development of capital markets, since they channeled mid and long-term resources to companies making capital markets redundant as financing sources (Calderón, 2005). In some countries, several intermediaries were liquidated, like the Banrural System in Mexico, and others were reoriented to complement instead of displacing commercial banks, like the case of NAFIN in Mexico. In fact, in the 1980s and 1990s development banks had little activity, and were confined to fill the gaps left by the market, like asymmetric information, and endogenous credit segmentation.

In reality, development banks, as financial savings and credit entities, gave way to development agencies which intervened temporarily in the markets and with the purpose of developing the markets. The financing of development banks to SMEs corrected some market gaps that prevented the access of these enterprises to bank credits. However, these were credits for working capital, so financing for capital formation continued being marginal (Morfín, 2009). In this sense, and following the functions assigned to development banks, their action was restricted, and relatively passive towards the development process, meeting a demand for funds generated by ongoing investments that were not satisfactorily met by the existing financing system. According to this approach, the main function of a development banks is to finance the "repressed

demand" for long term credit, so sector banks tended to predominate (agriculture, housing, exports among others) (Hermann, 2010).

Evidence shows that reforms did not achieve the desired depth of development of capital markets, and together with the lower activity of development banks in the eighties and nineties, contributed to worsen the long term financing problems, thus restricting economic growth (ALIDE, 1997). In some countries, the creation of long term financial instruments was incipient and occurred mainly through the bonds market, the risk capital industry, investment and guarantee funds, credit insurance, and the development of derivatives markets (Titelman, 2003). According to this author, the result was a high concentration of short-term financing with highly segmented credit markets, which translated into insufficient access to credit by SMEs, small farmers, and young people without credit history but with innovative projects. This led, in the end of the nineties, to once again promote development banks in some countries, with multiple functions linked to the development process (Hermann, 2010).

Several institutions made an innovative financial contribution to foster SMEs, for example, to create productive chains, facilitate financing between suppliers and users of products, and to try and share risks with government entities in very specific sectors. There are also examples where public enterprise issues have been guaranteed, allowing the replacement of domestic for external debt, or participate in the syndication of credits. Likewise, in some cases trust funds were created to negotiate foreign debt titles and monetize them to use those resources to finance enterprises in the short term; also to support export companies and provide resources to non-banking microcredit entities (Calderón, 2005).

Titelman (2003) mentions the importance of financial intermediation functions, such as factoring, financial leasing, asset-backed securitization, trust fund administration, and the provision of guarantees. Argentina, Bolivia, Brazil, Chile, Mexico, Colombia and Peru have made significant progress in the securitization of mortgage credits; Mexico, in the case of factoring and guarantee provision. Second, as the author states, it is essential to provide venture capital funds. Venture capital funds are instruments to finance the creation of enterprises in innovative areas, which are thus risky, and not all projects survive commercially, but those that do, have high rates of return. This industry, known as "venture capital" has played a significant role in the US, to finance new information technology industries, the development of Internet, e-business, and biotechnology. In Latin America, these funds are insufficiently developed, but there has been some significant progress (Rivas, 2004).

According to the broader approach, the functions of a development bank go beyond the repressed demand, and include more active actions in the development process. In this perspective, a development bank should anticipate demand, identify new sectors, activities, products and strategic productive processes for national development, and promote investment programs in those areas. Besides the typical activities of a financial institution, that is voluntary or mandatory savings, and channeling the resources to finance selected investments, this action also includes research activities, technical support, and eventually, the creation of investment and financing programs (Bruck, 2005).

Today, a prime case of this perspective is BNDES, in Brazil, which since the end of the nineties has had an interesting performance. This institution implemented a series of financing instruments and lines to cannel resources to large industrial and infrastructure enterprises; it also increased its participation in agriculture, trade, services, and for MSMEs. According to Hermann (2010), between 1990 and 2006 its anti-cyclic role predominated,

and the bank prevented an even greater retraction between credit and GDP, and probably of investment rates, and the growth of the economy itself.

Moreover, the case of BNDES is particularly important when it is integrated as an entity that aided the industrial policy in 2004 with the government of Luiz Inácio Lula da Silva. Together with other government entities, BNDES participated directly in the creation of the industrial, technological and foreign trade policy (PITCE), through which government programs supporting exports became part of the programs promoting industrial development, concentrated in sectors with a high capacity of innovation, and destined to increase competitiveness (Carvalho, 2005), becoming one of the main public financers (Hermann, 2010). Between 2004 and 2011 credits granted by BNDES went from 40 billion reals to 139.7 billion reals. In the case of Mexico, De María and Campos, Domínguez, Brown and Sánchez (2010) have urged to "reinvent" development banks in that country, to support sector and regional programs, emulating the role of those banks in countries such as China, India and South Korea.

Having mentioned the case of BNDES in Brazil, it is important to take into account that development banks may act at the global, regional, sub-regional, and national levels. The Multilateral Development Banks are characterized by operating in many countries. These banks have the capacity of obtaining resources in international financial markets, to them loan them to member states in more favorable conditions than those of private financial markets. Similarly, they mobilize official resources to cannel them towards beneficiary countries. In the sub-regional level, we must mention the Central American Bank for Economic Integration (CABEI), the Caribbean Development Bank (CDB), the Development Bank of Latin America (CAF), the Financial Fund for the Development of La Plata Basin (FONPLATA), the Latin American Exports Bank (BLADEX) and the North American Development Bank (NADB).

CABEI contributes with one third of the financing of the development banks in Central America and its strategic areas are social development, competitiveness, and Central American integration, which cross over the area of environmental sustainability. The strategic area of integration is of particular importance, since the efforts of CABEI are focused on the integration process, thus contributing to strengthen intra and extra regional trade, fostering development, and deepening the regional financial market, which benefits the physical integration of these countries and supports initiatives to strengthen community institutions.

Another interesting experience is CAF, a development bank created in 1970 and presently formed by 18 countries in Latin America, the Caribbean, and Europe, as well as by 14 private banks of the Andean sub-region. Specifically, this bank can finance the private productive sector through long term credits for companies, for construction and the purchase of assets (civil works, machinery, and equipment) for the production of goods or to provide services. It offers credit lines for working capital, which may be used for example, to purchase raw materials. It also supports the work of private enterprises in infrastructure, transportation, ports and airports, mining, electric power, oil and gas, among others, including those that require their support through financing those awarded public bids.

It is interesting that in many cases of long term financing, this bank doesn't act alone but in association, under the figure of co-financing, with other private, public, or multilateral financial institutions. These types of institutions should be strengthened and finance projects aimed at including countries of several sizes to help reduce asymmetries in the region, thus increasing their impact among smaller countries. Production integration in the

region is benefited by loans for multiple infrastructure projects in member states, but a greater number of projects that take into account joint production processes would be useful in the efforts towards regional integration.

3.5 Creation of suppliers, information network and foreign investment

The dismembering of production chains in Latin America and the Caribbean has made it difficult for several large local and foreign companies to find suppliers. For this reason, programmes focusing mainly on the creation of suppliers are very attractive.

Furthermore, the potential of small and medium-sized enterprises to become suppliers has increased thanks to ICTs, as they enable enterprises to establish a virtual connection with other companies and through this means receive training and transfer of technologies, and also facilitate the business of these companies. Although the majority of SMEs continue to be very basic, with precarious technology, unskilled labour, etc., a significant number are emerging with a different profile: these can be companies arising from business incubators, which are spin offs from other companies, or companies that are created especially as suppliers of other larger companies. In this regard, several of these companies emerge with an already defined insertion in the Global Value Chain or Regional Value Chain. The advance in technology allows several small companies to incorporate better into the complex productive processes and have the flexibility of adopting to the diverse and changeable needs in the market, particularly in the service sector, for example software, e-commerce, etc. (Sztulwark, 2011). Similarly, SMEs that are not so advanced in technology from their creation can aspire to strengthen their capacities by using these new means of communication.

In Mexico, the companies with a capacity to attract other companies, such as driving companies of those referred to as “gazelle” companies which have significant growth are identified. Therefore, the main objective of the National Programme of Driving Companies is to strengthen the value chain of the main driving companies in the country. This is fundamental when supplying, which the large purchasing companies offer to their suppliers in the gazelle category by responding in a competitive manner to the demand of products and services, with the capacity to attract hundreds or thousands of small and medium-sized enterprises. This strategy has identified five sectors for the strengthening of value chains in Mexico, which are: government purchases, makeup industry, transformation industry (automotive, aerospace, electronics, electro domestic, and food, among others); commercial chains; and hotel chains. In the case of the aerospace industry, a number of small companies are being incorporated as suppliers of this chain.

The policies for State purchases can play a transcendental role to the extent that the State has the capacity to promote development through the focalization of local sectors and those at a decentralized level with a high potential impact on the generation of products and employment, which, under equal conditions, with imported products of the same quality and price, should have an advantage at the time of evaluating the offers of public bidding.

As indicated by Ocampo y Martinez Ortiz (2011), the policies for suppliers of PETROBRAS is a particular case of success in respect of productive policies at the sectoral level with development in the petroleum industrial chain, which reproduced and surpassed similar schemes implemented by Malaysia and Norway, among other countries, (De Negri 2010). The instruments were the use of purchase power by PETROBRAS and the clauses of the local content. The result was a significant increase of the local contents which exceeded 25% and 54% in the exploration and production phases up to 69% and 89% respectively, reaching high levels for the international trends that surpass the goals. Following the

authors who studied 70.000 companies that have signed contracts with PETROBRAS since 2003 and compared them to others with no contract signed, the impact of this policy was noticeable. A recent study noted that the number of scientists, investigators and engineers increased in the supplying countries more than in the non-suppliers, and the companies with contracts grew and exported more after signing the contracts with PETROBRAS (De Negri 2010). It can be thought that countries like Mexico, Chile and others, such as the Central American countries that have signed FTAs with North America are prevented from having these types of programmes, but these agreements have an umbrella investment under which public purchases can operate in the manner indicated.

A relevant aspect of this policy of suppliers of PETROBRAS is that it demands the development of production capacities that did not exist, based on an integral policy that particularly includes a component of research. This policy also attracted Foreign Direct Investments towards this sector. The result of this strategy is that Brazil became one of the worldwide leaders in petroleum technology, consolidating a network of knowledge with universities around the world, typical of the mature innovation systems. By means of a succession of phases in which the participation of networks of information went from an assimilation level to an adoption level and finally to the generation level, PETROBRAS, a latecomer company into the petroleum industry, participated in complex and diverse growing networks and managed to complement their innovative works with that of their partners in the network (Dantas and Bell, 2006).

Recently, the FDI has had to look for more local suppliers and assist them in creating the necessary capacities. This phenomenon can be seen in the auto parts industry in Mexico, Brazil and Argentina. Also, there is a more active part by the State, since they are adopting a new focus on policies to attract the FDI to negotiate, for example, advance in the aggregate value scale by means of the local production of more complex components or design activities, among others. An example can be seen in the actions of ProMexico to attract investment in the aeronautic industry or the development of electronics in Costa Rica.

This type of relation between suppliers and multinational companies can also be seen in the agriculture sector. The case of coffee in Brazil is interesting. The actions of Illycaffe, an Italian company of high quality coffee, have had a great impact in Brazil as shown in a recent study (Cafaggi, 2012). By means of a programme the company contributed to the organization and establishment of logistic works and quality control, strengthened the relationship with the suppliers and created a bond with the University of Sao Paulo to access the best procedures to obtain high quality coffee. Likewise, the presence of Illycaffe in Brazil had fundamental impact on the sector, influencing new initiatives aimed at distinguishing products that resulted in the creation of a brand of the *Federación de los Cafeticultores del Cerrado*, and also the emerging of other high quality competitors. Finally, these strategies by Illycaffe[30] in Brazil changed the image of Brazilian coffee in the international markets since the large transnational companies did not consider Brazil as a potential supplier of high quality coffee.

The above suggests that it is important to have policies that are attractive to Foreign Direct Investment, oriented to the objectives of development and using the power of negotiation to obtain greater spillover technology and learning as practiced by China and other Southeast Asian countries.

[30] Illycaffe became the first company in the world to receive the certification Responsible Chain Supply of Det Norske Veritas (DNV) with focus on sustainability and their relations with the shareholders through the production chain, particularly with the suppliers of green coffee.

3.6 Public-private alliances

The new policy for production development has a more long-term vision than that which predominated during the 1980s and 1990s, which mainly focused on eliminating obstacles to the free functioning of the market, but the direction in which the economy should have advanced was not an area in which the government should have gotten involved. A new vision considered it important to have a joint strategy of the State and private sector to establish priorities and goals for development.

Although Latin America and the Caribbean have not yet reached the degree of maturity seen with the extra-regional experiences in matters of public-private alliances (PPA), there is a very rich experience in dialogue among the main economic and social participants and the State, who have played a significant role. This phenomenon has been seen globally with dialogues, special commissions, including permanent advisory organizations of the Presidency and interchange of ideas aimed at the definition of strategy, local planning of development or both. Also, public-private collaboration between sectors and regions can be observed, in some cases even more mature than in the global environment. Finally, there has been a certain incorporation of representatives of the private sector into the organizations governed by public policies.

In other words, these alliances are beginning to be outlined in the region as an "assembling tool" with the purpose of combining the interests of different sectors that put into effect the full capacity of the country, with the aim of consuming the economic transformation as indicated by Devlin and Moguillansky (2010) regarding this topic. These authors distinguish between: a) PPA in the global environment that can be advising committees of the presidency or even participate in the definition of strategies, b) public-private collaboration in sectors and regions and, lastly, c) PPA in public entities.

These alliances can be formal and structured or can be informal and understood. In certain countries the coexistence of various types of dialogue may prevail, which have been characterized as "hybrids". Examples of the first are those that predominate in Barbados, Colombia, Panama and Peru. In those countries, legislations have been made with respect to the procedure for public-private collaboration, granting a formal status that facilitates the legitimization of these alliances and their organization, at the same time, in a certain manner, protecting them from changes in government and their different conceptions.

Informal dialogues exist, for example, in Costa Rica, where the public and private sectors are permanent collaborators, but without formal instances that define this relation. There are also specific participations, such as in Mexico, originating from announcements by the government with specific duration and functions. Finally, in Brazil various types of dialogue co-exist, since at the highest level of the government there is a formal and structured alliance within the framework of the Economic and Social Development Council (CDES), whilst a special model of public-private collaboration still exists with respect to policies and specific plans, as for example, in the policy of productive development. In Chile, the predominant form is also hybrid, characterized by a formal and structured alliance in the cases of National Council of Innovation for Competitiveness (CNIC) the Regional Agency for Productive Development and in sectoral agglomerations defined by the innovative strategy.

In some countries of the region it has been particularly difficult to reach a common vision or there has been a lack of confidence between the public and private sectors in the local environment. However, there have been successful alliances – in specific cases – with respect to regional projects. As a reason, it has been credited that the participants

are more homogenic with a greater range of common objectives, which facilitates the construction of consensus. In other cases there are common ties among the members prior to the creation of the alliance, particularly when this involves the elite management. Lastly, in the larger countries with federated systems, the need to compete with the other states or provinces and with the federal government can be a unifying element. As examples, mention was made of Argentina and Mexico where important regional and local alliances have been established in respect of specific industries such as electronics and computer programmes in both countries, the coffee producers in Mexico, the wine industry in Mendoza, Argentina, and the agro industrial chain in this same country.

The authors emphasize that these public-private alliances will only represent a useful tool for the strategy of development if the State collaborates closely with the private sector, but retaining its autonomy with respect to safeguarding the public welfare or, what Evans (1995) – a pioneer in modern industrial policy – refers to as "deeply rooted autonomy". It is recommended that these alliances be based on three pillars: a strategic vision of a proactive country on a medium and long term, a decisive support by the State of the alliances and an efficient execution.

Finally, no country begins from scratch, since the countries in the region have experience in matters of horizontal intervention of the State, and several have advanced towards a more focalized industrial policy. Devlin and Moguilansky suggest that in order to have intelligent strategies for productive transformation, more capital should be invested in strengthening the institutional design and the execution of the public-private alliances, whenever they exist or not, it is required to implement experimental pilot programmes at the local or sectoral levels.

With an increasingly fragmented productive system, in which a growing number of participants intervene, the cooperation among these and a vision of shared goals seem to be indispensable in a new industrial policy. The current productive system operates with the intercompany cooperation, the generation of externalities and agglomeration economies. From there, the importance of the connection and or the interaction among economic agents: brokers and intermediates, institutions for company support, cooperative networks for companies and government agencies for development. All of these require dialogue and coordination in a horizontal and vertical manner (Sepulveda, 2006).

4. R&D policies to promote an increased added value and competitiveness

Previous chapters show the production structure towards the services sector, which is dominated by low productive activities, in general, have had to change the primary production as a proportion of the GDP, while there has been a tendency toward the deindustrialization and a retreat in that Latin American and Caribbean countries. Exports have been refocused in several countries and in general, have been located in markets of low added value. In this regard the region needs to make the effort to diversify their production and advance technologically in all sectors. Small and medium-sized enterprises that represent the sector offering the larger amount of employment (formal and informal) need to incorporate into the value chains that guarantee higher aggregate value. This chapter shows the advances made in matters of ICTs as a means of modernizing the productive system and the productive sector, and also the possibilities of endogenous generation of technology in environments such as the agriculture sector, among others.

4.1 Challenges in R&D and technological innovation in the Latin American and Caribbean region

The current technological revolution is the most radical in history and its dynamics have no precedents. The huge advances in information and communication technology (ICT) as well as in transport and satellite, among others, have permitted significant changes in the productive systems. This phenomenon has been manifested in the deverticalization of the productive processes and the delocalization of the various links of the productive chain in the manufacturing of goods as well as in services.

In practice, the developed countries have moved towards the new economy of information and thereof have created a constant source of technological innovation. The productive transformation segment – raw materials and labour – is approximately 20% of the total value of product currently in the industrialized countries, while the rest consist of non-material added value. The production has become more intense in knowledge and has increased the complexity of the productive processes. This new phase of the productive system has brought about new capacity requirements, including professionals and technicians that can make analysis of systems and models, specialists in information and knowledge, communications, among others (De Bandt, 2006).

Latin America and the Caribbean, since the end of the 1980s, have transited a "destruction" and "creation" process of productive, technological and institutional capacities, from which a new productive and technological situation has emerged, accompanied by a change in the structure and profile of the companies of the region, according to Katz (2006). The conditions under which these changes occur have not been very appropriate for catching up with part of the region similar to that of the Asian countries, given that due to international commitments for the protection of intellectual property, it is not easy to copy products and create reverse engineering. In this manner, carrying out investigations and introducing innovations is essential for the productive development of developing countries.[31] This has been understood clearly by China, which for several decades nurtured on the technology provided by the massive FDI that entered this country, but currently their priority is to create their own technology (their goal is to dedicate 2,5% of their GDP to R&D by 2020) (Dahlman, 2009).

In practice, there has been a deindustrialization in the regional countries, but under the current conditions in which a great diversity and segmentation of markets prevail, there is room for the production of a great variety of goods and services with a very ample range in technology, from the most traditional to the most sophisticated, intensive in knowledge; from artesian to well advanced technological services such as the interpretation of biological data and the detection of failures in sophisticated processing equipment (Perez 2010).

Within these conditions, new industries and new technological capacities have appeared in these economies: the natural resources processing industries are distinguished, such as processors of vegetable oil, metal industries, cellulose and paper, aquaculture, floriculture, among others, with very good results in exporting, particularly in the countries of the Southern Cone, while Mexico and Central America remain in the industrial production, particularly in assembling products, incorporated largely to the global value chains (Katz 2006). The Caribbean countries, with some exceptions, are in the service sector, especially tourism. To the above, we can add the multiple companies that have

[31] In fact, some authors sustain that the problems of coordination are more important than those of appropriation of new knowledge. According to this perspective, there are many new products and technologies that the countries of the region are in a condition to develop, but, as expressed by Hausmann and Rodrik (2003), much of these are yet to be "discovered".

emerged in the services area that are related to ICTs, of great dynamism, with more and more complex technology.

The possibilities for the countries in the region to collaborate or work jointly in productive activities have increased thanks to the advances in information technology. In 2012, 118 million persons had access to broadband, according to consultants ComScore.[32] The perspectives of acceleration in the incorporation of ICTs in the region have given rise to the entry of new participants that will help in this process. For example, the Japanese company Furukawa, manufacturers of optic fibre, structured cable and the installation of triple play, have constructed three production plants in Latin America, located in Panama, Sao Paulo (Brazil) and Berazategui (Argentina) and various commercial offices (in 2009 alone they increased their production capacity by 70% in Argentina).[33] The challenge for the region is to increase and to take more advantage of the connectivity than they are currently doing, and for this the collaboration among countries is essential. To date, the most important initiative in this regard is the Latin American Corporation of Advanced Networks (RedCLARA) created in 2004) and financed mainly by the European Union, although with local participation also. The objective of this programme is to interconnect, through the RedCLARA network, the academic and investigation networks of Latin America with GEANT, its equivalent in Europe.

For this purpose, in several countries, RedCLARA helped to create the National Network of Research and Education, an initiative that is contributing to reduce the digital gap within the region and between this and the developed world. This involves generating a regional capacity for scientific and technological collaboration, which is essential for creating a society of information in the region that would permit for development of its own technology (See Box 1).

[32] Infobae.com,http://America.infobae.com/notas/50626-America-Latina-cada-vez-mas-conectada-a-internet.

[33] Todo Logistica y Comercio Exterior, "Japanese export optic fibre cables to Uruguay from Argentina". http://www.todologistica.com/site/index.php/latinoamerica/uruguay/40-negocios-y-comercio-exterior/68-japaoneses-exportan-cables-de-fibra-optica-a-uruguay-desde-argentina.html. Consulted on18 May 2012.

Box 1
RedCLARA

RedCLARA was created in 2004 and its members are Argentina, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Chile, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Dominican Republic, Uruguay and Venezuela (although in 2012 five of these countries were still waiting to be connected). This Network connects 729 universities (more than 671.986 academics, 104.607 investigators, 3.763.142 student) at speeds of 622Mbps. RedCLARA has provided scientist and investigators in Latin America with a channel of collaboration with the global scientific community at a regional and international level, using the GEANTZ connections, in Europe, and Internet2 in the United States.

RedCLARA offers a series of services, including the integrated service of multi conferencing, video chat, and searches for partnership for projects, alerts for financial funding, alerts for events, services for events and academic activities, websites for communities and direct transmission.

Projects have been developed on climate change, telemedicine, radio astronomy, update of the Biodiversity Cosmic Rays Observatory, physics of high energy, providing learning and experiment environments.

Currently there is a series of projects that are significantly beneficial for R&D in the region, for example, the E-Infrastructure shared between Europe and Latin America.

Sources: portal.oas.org/LinkClick.aspx?fileticket=aSrfdKu2TDc%3D; URL: http://www.augeraccess.net/; http://www.eu-eela.org/

In addition to the CLARA initiative, there is CEPAL @LIS2, which is aimed at promoting the information society in the region, as well as getting closer to Europe in this matter. The CEPAL @LIS2 programme is focused on five priority areas, promoting ICTs: health, education, Access to broad band, electronic government, and productive sector, that is, the use of ICTs as a form of modernizing and upgrading Access to new markets, particularly the small and medium-sized enterprises.[34] Tied to this initiative is the Regional Dialogue on Broad Band which is a common space where the countries of the region interchange information and make a collective effort to spread the broad band to other territories in the region. The main idea is that, based on the information provided by the countries, the local demand is added and this gives rise to interchange of traffic of broad band regionally, which accelerates and reduces the costs of this service.[35]

Thanks to the improvement in the infrastructure of ICTs there are now several companies that have been able to locate in very sophisticated markets of technology from inside the ICT sector. This is the case of several production platforms: those of operating systems, which include microprocessors, internet search engines, and reproducers of communication networks, among other applications. The case of ARTech Consultores S.R.L. in Uruguay is a very interesting example of successful platform for development of software based on information (Box 2).

34 http://www.eclac.cl/socinfo/.

35 At the subregional level the construction of the Mesoamerican Highway of Information will be very useful to help Central American countries to reduce the costs and improve the offer of digital services, particularly broadband, thus opening new paths to a region which is lagging behind in terms of ICTs. This interconnection is being done with optic fiber and using the same infrastructure of the electric line of the Electric Interconnection System of Central America. The network extends from Guatemala to Panama, which will help to optimize resources and achieve greater convergence in electricity and telecommunications.

Box 2
ARTech Consultores S.R.L.

This company was created in 1988 by two computer engineers. They began automating the programming of a more efficient data base. They introduced the first version GeneXus in 1989, mainly in Latin America. Currently ARTech has offices in Chicago, Sao Paulo, Mexico and Shanghai, distributors in 28 countries and 4,500 companies use their software.

The main strength of GeneXus is the "administration of knowledge of business systems".

GeneXus Works with pure knowledge, which allows for several things: generate programmes (traditional software), understand such knowledge from individuals (does not require additional information), and operate automatically with this knowledge (integrating it with other knowledge from other sources, publishing it, granting licenses to third parties to integrate it to their applications)." GeneXus makes possible the "information business" as a step forward in respect of the "software business".

Another advantage of working with pure knowledge is the possibility of generating applications for multiple platforms and multiple applications and, very particularly, counting on a certain type of "safety" between the technological changes: for example, the users of GeneXus that have been developing applications for 8 or 10 years for an AS/400 with very primitive text screen and technology can now take advantage of the information on development of these applications by GeneXus except for easily developing Java and or .NET applications, despite the fact that when these applications were developed no one could think of anything so different with respect to the environment in which they worked.

Most important environments and languages

1. **Platforms**
- Execution Platforms: JAVA, Microsoft .NET, Microsoft .NET Compact Framework
- Operative systems: IBM OS/400, LINUX, UNIX, Windows NT/2000/2003 Servers, Windows NT/2000/XP/CE and Windows Vista
- Internet: JAVA, ASP.NET, Visual Basic (ASP), C/SQL, HTML, Web Services
- Mobiles: iOS, Android, BlackBerry

2. **Databases**
IBM DB2 for iSeries and UDB, Informix, Microsoft SQL Server, MySQL, Oracle and PostgreSQL.

3. **Languages**
JAVA, C#, COBOL, RPG, Visual Basic

4. **Multiple architectures**
Multiple layer, Web-based Architecture, Client/Server, centralized (iSeries), Mobiles.

Source: Visión General de GeneXus, GeneXus
http://www.genexus.com/productos/genexus/genexus-home?es
Consulted on 14 May 2012

Other relevant examples in matters related to information services and software in Latin America are the Chilean group Sonda, which specializes in providing integration services, consultation, software development on demand and which is present in ten countries in the region; the group ASSA in Argentina, specialized in consulting and maintenance of software packages for multinational companies such as SAP and Oracle (López, Ramos y Torre, 2009); AND Softek of Mexico, which is the largest independent provider of IT in Latin

America, with offices in several countries in the region and which offers services related to applications, outsourcing of business processes, support of IT infrastructure and software products and associated services. Some countries in the region are already important points for the location of offshoring of business processes or for shared service centres, but the possibilities of theses expanding are very large (López, Ramos and Torre 2009).

Additionally, it is a special challenge for Latin America and the Caribbean the importance of their traditional specialization of natural resources, where there is an abundance and comparative advantage. Although half a century ago being specialized in these resources was equivalent to being dependent on the export of goods with declining interchange terms, of products with low added value, and a variety of restricted products, currently this situation has changed. The large number of Asian countries, with abundant availability of labour, but no raw materials has caused a significant increase in the demand for these. The conscience of strategic value of these resources and the inevitable shortness of these, whether now or in the future, have awaken the interests to assure access to these by a number of countries, particularly the industrialized and emerging countries.

Therefore, for this advantage to make a real difference in the development of the countries of the region, this type of production must be incorporated into a more modern technological source, which helps to diversify production, adds value and has a more productive effect together with the economy (Devlin and Moguillansky, 2012), also jobs must be generated, instead of being expulsed from these. The jobs in Australia and New Zealand are interesting in this regard, since, being specialized in exporting natural resources they are in a state of development significantly more advanced than the countries of Latin America and the Caribbean.

In Latin America and the Caribbean, the higher demand for primary goods has encouraged greater production, but without the development of an important parallel technology. If a strategy is pushed, focused on works based on natural resources, to continuously improve technologies, creating niches of high added value, these countries can overcome their significant condition of disadvantage (Perez, 2010).

This focus requires an effort to assimilate and develop these technologies:

(1) Processing industries (direct transformation of raw materials); that is, homogenous products produced on a large scale (such as steel, aluminium, paper, refinery and hydrocarbons, beer, petrochemical and some food). (2) Products that are manufactured on an intermediate scale (chemical, biotechnology, nanotechnology). (3) Products that are manufactured on a small scale and other market products. Moreover, countries can open technological trajectories in the areas of materials science and sciences of life (Pérez 2010).

The technological proposal by Carlota Perez (2010) for Latin America and the Caribbean has an inclusive vision from the social point of view. It is based on a dual strategy in which there must be coordination among various productive agents. This strategy has two components: one "from above" that would boost the competitiveness in certain niches in the technological border worldwide. The other part of the strategy was conceived "from below" and would focus on a specific territorial level – local or municipal – and would require various supports to create a higher value added production. At this level specialized *clusters* are considered appropriate to benefit from local advantages (Pérez, 2010).

Within this dual vision, the strategy "from below" would point to the reduction of poverty and the action "from above" would help activate and strengthen the economy, which would provide resources required to finance the strategy "from below" (Pérez, 2010). The role of technological innovation in the primary sector of LAC, particularly in the agricultural sector, also has an important role in food security and as a supplier of energy products (biofuels). Its role in generating employment and improving these can make a big difference in the living conditions of sectors of the population that currently are among the poorest. To make a scheme of this type possible, it is necessary that the State intervenes to ensure that some of the benefits gained from the most prosperous sectors will help finance innovation in most disadvantaged sectors. Although not exactly designed in the proper manner, an important reference point for the financing of technological innovation is the creation of an Innovation Fund in Chile financed with the profit obtained from the copper mines (during the periods in which the price of this metal has risen considerably in the international market).

There are important experiences in this field, such as that of Brazil in the development of varieties of soybean in the Cerrado area in the northeast of Brazil (see Box 3). The impact of this monoculture in areas originally rich in biodiversity is currently an issue of much discussion because of their negative environmental effects. However, the ability to do R&D and apply new knowledge in the area of biogenetics is interesting to mention, because the gear between the innovative activity, capacity building, and the financing and technical assistance is very illustrative of the requirements for successful productive development in a specific sector. This scheme could be applied to the most varied and environmentally sustainable production in the region.

Box 3
Soy cultivation in the Cerrado areas

EMPRABA, The Brazilian agency for agricultural research, was created by the government in 1973, in order to increase food production to meet the growing demand in urban centers. The idea was to expand production to more arid regions. The soybean emerged as an attractive cultivation due to increasing demand in the international market as food for livestock.

New soybean varieties were created, adapted to these soils and technological packages were developed for farmers (via EMATER, the Technical Assistance and Rural Extension of the State of Minas Gerais), so that they could implement the new technologies. This company closed down in 1991, but the producers' cooperatives continued to offer this technical assistance, while the large producers managed to sustain direct contact with EMPRABA to keep updated in technological matters.

Throughout its existence, innovative efforts of EMPRABA were accompanied by the availability of financing, by various institutions that have helped modernize agricultural production, including machinery and equipment.

In this given case, the coordination between the various actors was essential for the success in the technological innovation in the soya cultivation. Currently, Brazil is among the four largest exporters of soybean in the world.

The efforts of EMPRABA in other areas of culture, such as wheat, considered vital to the nation's nutrition, was less successful than sorghum, due to the imposition of a series of restrictions on the producers.

Source: Sabel, Fernandez-Arias, Hausman, Rodríguez-Clair, Stein (Eds.) (2012), Self-Discovery as a Coordination Problem: Lessons from a Study on new exports in Latin America, IDB, Washington DC.

The experience mentioned in the production of soya is not easy to achieve, as documented in a recent IFPRI study (Falck-Zepeda, et al, 2009). The countries studied by IFPRI in LAC that have invented or developed new technologies, have barely been able to transfer them commercially, so that in practice, conventional technologies are adapted to local production. Among the obstacles to exploiting advances in local R&D are the limited capacities to assess the biosafety and its high cost, as well as the complexity of the regulatory processes. However, in addition to the aforementioned, the intellectual property rights on technology create great limitations for soybean seed management. It is a challenge to the countries that are planting soybeans to produce their own transgenic technology. Similarly, the development of other proprietary technologies linked to the value chain of primary products.

The joint effort by the countries of the region in creating R&D centres to develop biotechnology and laboratories that would assess biosecurity and food security would be of great utility, especially for smaller economies whose financial possibilities for these processes are still less than for other economies.

In this connection, it is worth mentioning at least two regional experiences in Science, Technology and Innovation (STI): (1) the Mesoamerican Network for Research and Development on Biofuels (RMIDB), which groups together public and private sector institutions and is aimed at generating knowledge and new products with a regional impact to meet the sector's demands for technology and prospections; (2) Network of Research on Biomedicine of MERCOSUR, with the participation of research centres of the four MERCOSUR countries. It is aimed at studying diseases of concern in this subregion (See Box 4).

Box 4
MERCOSUR Biomedicine Research Network

In January, 2012 Argentina, Uruguay, Paraguay and Brazil established the first MERCOSUR Biomedicine Research network. The network comprises the Institute of Biomedicine at the Ministry of Science and Technology in Argentina, the Oswaldo Cruz Foundation of Brazil, the Central Public Health Laboratory of Paraguay and the Pasteur Institute in Montevideo, Uruguay. This network will be financed by the Structural Convergence Fund of MERCOSUR (FOCEM), which is the entity created by the regional bloc to reduce regional disparities.

The first project which was launched was called "Research, education and biotechnology applied to health". The four research centres will coordinate their efforts to study diseases such as Alzheimer's, Parkinson's, diabetes, obesity and neurological diseases, such as dementia. They will also address parasitic diseases, such as Chagas' disease, which due to its incidence in the region, requires special attention.

The network will integrally and complementarily address training of human resources, purchase last generation equipment, and promote the design of innovative joint projects.

Source: http://www.abc.com.py/nota/paraguay-integra-red-de-investigacion-en-biomedicina/

The exchange of experiences and the joint efforts to simplify and optimize the regulatory frameworks would also be an important support for the countries. A restriction, often pointed out by studies on technological development in Latin America, is the lack of critical mass to achieve a breakthrough in science, technology and innovation (STI), even in the largest countries of Latin America, such as Argentina, Brazil and Mexico (Dutrénit

and Ramos, 2012). This critical mass should be generated through a greater public budget than that currently allocated by governments for R&D, so as to strengthen national innovation systems that in turn generate more solid achievements in science, technology and innovation.

But there are encouraging examples in the region regarding technological innovation. Of great interest is what is happening in the wine industry in Chile and Argentina thanks to the relationship among different agents (Giuliani, Morrison and Rabellotti 2011). The authors show us that traditional sectors are not necessarily low technology and low knowledge-intense sectors, but that they may be otherwise thanks to the acquisition of theoretical and practical knowledge of the dominant wine producing countries, which has made it possible to improve capacities, establish new routines and apply better practices. This case also confirms the scope of the networks of enterprises, with public actors and researchers. Universities and scientists have emerged as the major players, and the links between industry and research centres are becoming increasingly important, as they are being promoted by institutional changes. Producer associations, research institutions linked to government action through the political instruments focused on exports.

But such restriction on IP access leaves some gaps that developing countries can take advantage of. For example, in the pharmaceutical sector, when the patents expire, generic drugs can be freely manufactured. To take advantage of these opportunities, countries must have the laboratories and the required certifications. India has developed this sector enormously and is a major exporter (and has also purchased companies in many countries). Consideration should also be given to open source digital programs that can be used by the general public and that allow for innovations of software innovations and other very useful applications.

4.2 Productive development niches with potential for collaboration by two or more countries (cases)

Several of the areas in which joint activities have been developed were mentioned in previous sections and some of them have greater potential than what they have developed thus far. This is the case of the automobile sector, in which there are agreements between Argentina, Brazil and Mexico, but where, without formal agreement smaller economies participate to produce auto parts, as is the case of some Central American countries and Paraguay. These investments can somehow help overcome the asymmetries among countries, enabling production diversification in the latter countries.

In addition, there is an entire regional and international market in the field of software and associated activities where many Latin American companies based in several countries of the region are already participating and producing this type of services in a complementary or joint manner. This has also prepared them to compete in international markets.

There is also segmentation in the creative market, especially cinema and publicity in which several countries participate in the value chain, taking advantage of the existence of capabilities in various nations and creating well-paying jobs. LAC countries usually have very little public resources to finance film productions, but co-productions, between two or more countries, are a very useful way of financing a film.[36]

[36] This was the case of co-production between Ecuador and Colombia in the film “Fisherman” (financed by the National Film Council of Ecuador and the Film Development Fund of Colombia). This financing formula helps the movies to have greater distribution.

The supply of food products to supermarket chains, which have been progressively internationalized, together with the free trade agreements between the countries in the region have created a more efficient network to distribute products. The supermarket networks seek provisions in the local market especially in fruits and vegetables, but import from other neighbouring countries beef, seafood and other more elaborate food products, as well as household items. This type of trade has generated significant benefits in terms of technological diffusion in organization, processes, and in the transport chain (Stanley 2010).

It is interesting to note the case of the integration of the tourism sector in Central America. There is a Secretariat of Central American Tourism Integration (SITCA), which provides management and technical support to carry out integration programs and tourism sustained development in Central America. A program has been developed to benefit regionally from tourism and promote the countries with their own characteristics, differentiated from the rest of the countries, so that tourists are attracted by "multi-destination" travels to that area. This type of initiative could be very beneficial to other groupings of countries of the subregion. There is an emerging organization, the Organization of Latin American and Caribbean Tourism (OLACT), whose purpose is to promote cooperation in the LAC tourism industry (protecting the environment) improving the quality, bargain, promotion and exchange of tourist services.

III CONCLUSIONS AND POLICY PROPOSALS

The current milieu is very favourable for Latin American and Caribbean countries to propose an integration that goes beyond foreign trade and trade facilitation, which has been the keynote of regional agreements over the last two or three decades. Such approach is reinforced when considering the meager results in terms of economic and social development obtained with the development strategy driven by exports over the last few decades.

Strengthening productive relations in Latin America and the Caribbean – so as to help the region to promote its manufacturing sector, its agricultural sector, a truly productive services sector, and the integration of value chains – would be a contribution to the development of the region. A joint effort to generate R&D, educational and capacity building programs would be very positive within a context where technological innovation has become the main engine of worldwide development.

In the last two decades, the performance of Latin American and Caribbean economies has not been encouraging due to the following factors: (1) Insufficient GDP growth and a structural change of the adverse GDP (the manufacturing sector and the primary sector lost ground against that of services, very low productivity); (2) Exports growth that, while dynamic, did not contribute to economic development as was expected, nor managed to cover an external growing gap in trade in goods; (3) The imbalances within the region were not overcome and in some cases they even worsened, with the smaller economies being the ones that were faced with the biggest problems to enter a path of growth. In light of this situation, the strategy for better use of the region's potential takes on greater urgency, especially in view of the prospects of low growth in LAC partner countries in the coming years.

In order for the region to embark on a new direction in a cooperative manner, a productive development policy is necessary, or a shared industrial policy, which places special emphasis on a technological drive to the various productive areas, exploring new markets in which R&D achievements can be beneficial; integrate productive chains in the

region, promote public-private partnerships, make an effort to undertake regional initiatives that are more inclusive of the most undeveloped areas. It would all facilitate the financing of productive projects at the regional level. Specifically, this requires a regional policy aimed at the following purposes:

- Take the fullest possible advantage of the interconnection among countries to develop productive chains with greater added value. There are already examples thereof (automotive and pharmaceutical sectors, ICTs platforms, tourism, etc.).

- Combine efforts for joint advance of R&D, while bearing in mind the limited resources that countries have to do this individually.

- Use the virtual interconnection networks to develop plans for higher education and training in new technologies. This would help to compensate to some extent the scarce resources that are available to the countries for these purposes, and would help in training a critical mass of professionals for the entire region.

- Help develop the significant potential of productive chains in cutting-edge technology in service sectors, while taking advantage of the fast expansion of communication channels in Latin America and the Caribbean.

- Promote technological innovation in all areas of production, resisting the temptation of specializing in primary products of very little added value. Introduce new knowledge in the primary sectors (as in Australia and New Zealand).

- Take advantage of the successful periods of the prices of raw materials in the international market to create a regional fund for innovation (as in Chile with the Innovation Fund financed from copper).

- Help large manufacturers of some raw materials to become an axis around which national and regional suppliers are established (Petrobras in MERCOSUR).

- Encourage, at the subregional level – and in a coordinated manner between governments – the translatins and Foreign Direct Investment from other countries to incorporate small and medium-sized enterprises, such as suppliers, so as to generate local knowledge and transfer technology.

- Generate the necessary competition regulations to ensure that small and medium-sized enterprises can access the competitive market without having to confront barriers to enter and for local companies to compete with multinationals on equal terms.

- Develop subregional programs designed to overcome asymmetries among countries, with inputs according to each country's financial capacity and their usufruct differentiated in favour of the most decelerated ones (FOCEM, MERCOSUR).

- Encourage again development banking at national, subregional and regional levels.

- Facilitate access of small and medium-sized enterprises to the credit markets of commercial banks.

- Assist neighbouring regions that accommodate very poor populations with specific productive programs (border programs for production of Wood and Furniture, and Rural Community Tourism in Central America).

- Seek new sources of finance to develop environmental services designed to protect the environment and at the same time create jobs in poor and remote areas that are often located on border areas.

- Establish, in close collaboration between the public and private sectors, priorities and development goals at the regional level that allow a more strategic vision of the needs of investment, training, R&D, among others.

- Establish contact with the Latin American Diaspora to nurture the regional educational institutions and the R&D as well as to attract Foreign Direct Investment (contact with their Diasporas in India and China has been very important to these countries).

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