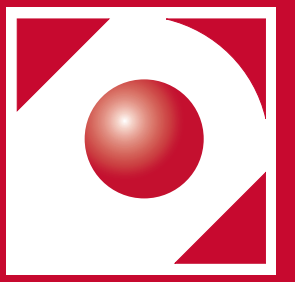

Emerging Markets Forum

Productivity and Competitiveness in Latin America: Policy Options to Close the Gaps

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Discussion Draft

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Productivity and Competitiveness in Latin America: Policy Options to Close the Gaps[1]

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1. Introduction

For the fourth consecutive year, Latin America continues to experience a buoyant economic performance, attaining its longest period of expansion in the last three decades. Such upbeat results are expected to continue in 2007 –when output is likely to grow by nearly 5%– and in 2008, although at a more modest pace. This extended period of high performance has been supported by the combination of solid global growth, favorable terms of trade (especially for South American countries), ample and cheap international liquidity, macroeconomic stability, all which resulted in booming exports, current account surpluses and thriving domestic demand.

Still, this recent performance has not been good enough to reduce the persistent income rift between Latin America and more developed economies, including emerging Asia. Despite the fact that the region has exhibited sustained growth over the past few years, the rest of the world has been growing at a steady path for a longer period, at higher rates, and with less volatility. At the beginning of the eighties, per capita output (in PPP terms) in Latin America was 35% of the average developed economy. Due to the rather poor performance of the region over that decade, this ratio dropped further in the early nineties. Thus, even if the region keeps growing at its current pace, within the next few years per capita income could reach a level as low as one fifth of the per capita income in developed countries.

The absence of sustained growth in Latin American economies is a consequence not only of low domestic investment, but of low productivity as well. While there have been some advances, frontier innovation is scarce and technology adoption has been limited, compared to other emerging economies. The evidence suggests that productivity gains in the region mostly stem from technological changes within sectors, whereas gains through factor mobility, from low productivity to high productivity sectors, have been limited. In contrast, factor reallocation has been a very important source of productivity growth in emerging Asia, and other successful European nations, such as Ireland and some Scandinavian economies in recent decades.

Low productivity makes it difficult for Latin America to compete in increasingly globalized markets and to participate in global value chains. In fact, multiple indicators suggest that Latin America lags behind in competitiveness. For instance, according to the latest competitiveness index of the World Economic Forum (WEF), Latin American countries fared poorly: the regional average ranking has been 81 in a sample of 131 countries (although there were great disparities between individual country rankings). Moreover, year after year, these results do not seem to improve as the region continues to be outperformed by more dynamic economies.

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1 This paper is based upon findings in CAF's annual Economic and Development Reports 2005 and 2006, and is prepared for the Emerging Markets Forum to be held in Montevideo, Uruguay, December 12-14, 2007.

2 Senior country economist and Chief Economist, Corporación Andina de Fomento (CAF), respectively.

The reasons for the income gap relative to successful global competitors thus seem to be rooted in productivity and competitiveness deficiencies. Latin American economies face the challenge of underpinning competitive sectors and enhancing productivity gains, an issue that is particularly pressing if current external conditions turn less favorable for emerging markets. This paper studies the factors that have hindered productivity and competitiveness gains in Latin America over time and, accordingly, poses some public policy recommendations.

A comprehensive policy agenda should contemplate policies that not only promote technological progress within sectors, but also facilitate a more efficient factor reallocation between sectors, and promote more competition. Nonetheless, it is also imperative that the strategy to improve competitiveness, increase productivity and generate high and sustainable growth, is accompanied by policies that guarantee poverty reduction and social inclusion, which no doubt remain the most pressing issues in Latin America.

The rest of the paper is organized as follows: the next section presents some stylized facts about competitiveness and productivity dynamics in Latin America, indicating the main sources of productivity gains in the region. In light of that, the third section discusses policy options and the fourth section closes with some final remarks.

2. Competitiveness and Productivity in Latin America

Competitiveness in Latin America

Efforts made to attain higher growth rates and further increase participation in international markets and global value chains, could be unfruitful without the support of complementary measures to improve competitiveness. Unfortunately, results are not very encouraging for Latin American countries, since they rank among the least competitive in the world. As was mentioned previously, according to the Global Index of Competitiveness of the World Economic Forum, the average ranking for Latin American and Caribbean countries was 81 in a sample of 131 countries, as can be seen in Table 1. This is in stark contrast, with the averages for OECD countries (18) and Southeast Asian countries (36).

Within the region, Chile continues to outperform its Latin American peers, holding position at 26, way above the Latin American average and even above certain industrialized countries, such as Spain and Italy. This performance can be attributed to its solid institutions, more efficient markets, and sound macroeconomic management, setting the right conditions for sustained and stable growth. Chile is followed by Mexico (52), Panama (59), Costa Rica (63) and El Salvador (67).

Latin America exhibits the smallest gaps with respect to the industrialized countries and emerging Asian economies in accomplishing the basic requirements for competitiveness (namely, macroeconomic stability, infrastructure, primary education and health), with the exception of institutional robustness, in which the region shows more deficiencies.[3] Moreover, in terms of market efficiency and innovation, the gap seems to be widening.

3 In fact, the region ranks 93, compared to the average for the OCDE (19) and South East Asia (46). In fact, Argentina (123), Bolivia (124), Ecuador (125), Paraguay (129) and Venezuela (131) are among the worst performers in terms of the quality of their institutions.

Table 1. Global index of competitiveness for growth and its components 2006-2007

Country / Region	Global index of competitiveness		Institutions		Infrastructure		Macroeconomic		Health and primary school		Tertiary school and training		Goods Market Efficiency		Labor Market Efficiency		Financial Market Sophistication		Tecnological Readiness		Market Size		Business Sophistication		Innovation	
	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*	Ranking over 131 countries	Index (/7)*
Argentina	85	3,87	123	2,99	81	3,03	64	4,91	54	5,61	51	4,22	115	3,53	129	3,49	114	3,49	78	2,96	23	4,83	75	3,97	91	2,91
Bolivia	105	3,55	124	2,97	118	2,22	49	5,11	91	5,11	91	3,42	125	3,26	121	3,65	106	3,64	126	2,25	96	2,79	125	3,05	128	2,25
Brazil	72	3,99	104	3,32	78	3,07	126	3,66	84	5,23	64	4,01	97	3,80	104	3,96	73	4,14	55	3,35	10	5,44	39	4,48	44	3,50
Chile	26	4,77	29	4,83	31	4,56	12	5,86	70	5,42	42	4,41	28	4,93	14	4,96	26	5,17	42	3,89	47	4,15	32	4,65	45	3,48
Colombia	69	4,04	79	3,67	86	2,87	63	4,92	64	5,47	69	3,88	85	3,93	74	4,25	72	4,22	76	2,98	30	4,52	65	4,10	72	3,11
Costa Rica	63	4,11	52	4,17	95	2,68	111	4,07	50	5,68	50	4,24	52	4,40	18	4,93	70	4,25	56	3,35	69	3,31	38	4,50	35	3,62
Dominican Republic	96	3,65	107	3,23	79	3,04	91	4,56	102	4,75	99	3,24	100	3,74	86	4,13	108	3,63	64	3,13	63	3,46	87	3,70	106	2,67
Ecuador	103	3,57	125	2,93	97	2,64	27	5,58	90	5,12	111	2,92	123	3,35	116	3,73	99	3,69	100	2,57	68	3,37	93	3,57	118	2,56
El Salvador	67	4,05	84	3,63	51	3,98	67	4,89	80	5,28	92	3,42	56	4,32	41	4,53	62	4,40	85	2,87	86	3,06	78	3,92	109	2,66
Guatemala	87	3,86	91	3,49	70	3,30	86	4,63	97	5,03	101	3,17	62	4,23	81	4,15	87	3,94	81	2,94	74	3,26	61	4,15	83	3,00
Honduras	83	3,89	89	3,58	75	3,18	71	4,82	92	5,11	96	3,30	87	3,91	61	4,33	81	4,01	98	2,62	94	2,81	84	3,79	101	2,75
Jamaica	78	3,95	87	3,61	63	3,54	120	3,78	72	5,38	71	3,83	57	4,29	53	4,42	49	4,66	43	3,89	113	2,34	69	4,04	59	3,27
Mexico	52	4,26	85	3,62	61	3,55	35	5,36	55	5,59	72	3,83	61	4,23	92	4,09	67	4,28	60	3,23	13	5,34	54	4,22	71	3,11
Nicaragua	111	3,45	108	3,22	116	2,27	115	3,96	100	4,94	108	3,04	111	3,61	97	4,07	92	3,87	120	2,32	97	2,76	110	3,31	124	2,48
Panama	59	4,18	66	3,85	50	3,99	52	5,06	57	5,56	73	3,81	54	4,33	70	4,27	23	5,20	61	3,18	93	2,85	49	4,27	87	2,97
Paraguay	121	3,30	129	2,67	126	2,02	117	3,85	89	5,12	112	2,87	116	3,51	114	3,74	95	3,82	128	2,21	90	2,96	122	3,18	130	2,11
Peru	86	3,87	106	3,28	101	2,56	78	4,70	95	5,07	84	3,63	67	4,14	87	4,12	46	4,68	80	2,94	53	4,01	63	4,11	100	2,78
Trinidad and Tobago	84	3,88	92	3,47	69	3,32	16	5,79	62	5,47	70	3,87	75	4,04	62	4,32	45	4,70	66	3,11	102	2,64	77	3,93	82	3,00
Uruguay	75	3,97	46	4,43	64	3,50	99	4,41	58	5,54	67	3,99	73	4,05	89	4,10	89	3,89	67	3,09	89	2,97	86	3,72	80	3,01
Venezuela	98	3,63	131	2,41	104	2,53	70	4,84	76	5,33	85	3,61	124	3,28	123	3,62	104	3,66	79	2,95	51	4,04	96	3,52	99	2,79
Andean countries Avg.	87	3,78	105	3,18	88	2,93	68	4,86	83	5,19	87	3,51	98	3,71	89	4,04	90	3,91	86	2,84	65	3,57	90	3,66	103	2,70
Latin America Avg.	81	3,89	93	3,47	81	3,09	73	4,74	77	5,29	80	3,64	83	3,94	82	4,14	75	4,17	78	2,99	68	3,55	75	3,91	88	2,90
OCDE Avg.	18	5,16	19	5,36	18	5,51	47	5,23	18	6,23	17	5,34	19	5,13	41	4,74	21	5,44	17	5,08	33	4,72	17	5,24	19	4,70
South Asia Avg.	36	4,70	46	4,57	48	4,39	53	5,12	54	5,65	43	4,54	29	4,97	32	4,90	40	4,97	46	3,86	27	4,70	32	4,73	38	3,96
China	34	4,57	77	3,71	52	3,97	7	6,03	61	5,49	78	3,77	58	4,26	55	4,40	118	3,35	73	3,00	2	6,80	57	4,18	38	3,60
India	48	4,33	48	4,32	67	3,45	108	4,21	101	4,92	55	4,13	36	4,66	96	4,07	37	4,93	62	3,17	3	6,16	26	4,81	28	3,90

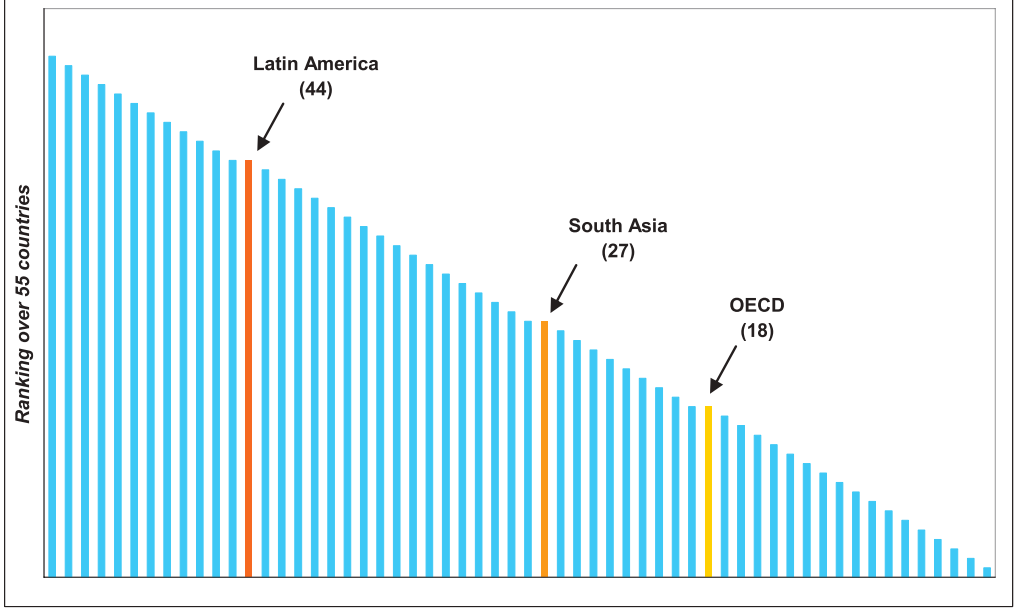
* Index out of 7 points where the more is the better.

Source: Own calculations, FEM (2007)

There are important differences across countries that the averages overlook. For example, in terms of macroeconomic soundness, although the Latin American average exceeds that of South East Asia (53), Chile (12), Peru (16), Ecuador (27), Mexico (35), Bolivia (49) and Panama (52) all outperform their South East Asian counterparts. In terms of market efficiency, business sophistication, and innovation, Chile, Costa Rica and Brazil closely follow the most competitive economies.

The results from the Competitiveness Index, published by the Institute for Management Development (IMD) show similar results for regional competitiveness (Figure 1). The average for the six Latin American countries included in the sample (Argentina, Brazil, Chile, Colombia, Mexico and Venezuela) in 2007, was 44 out of 55 countries in the sample; way below the OECD average (18) and South East Asia (27). Again, Chile ranks close to the most competitive economies in the sample. According to the methodology used by the IMD, the most important weaknesses for competitiveness in the region are poor technological endowments, insufficient basic infrastructure, ineffective health care systems, limited research and development, and slow productivity growth, among others.

Figure 1. IMD Competitiveness Index (2006)



Source: Own calculations, IMD (2007)

The World Bank publishes another indicator that ranks countries based on the cost of doing businesses. According to this classification, Latin America ranks among the worst performers in the sample, occupying position 91 out of 175 countries, only surpassing African countries. These poor rankings are attributed to cumbersome judicial procedures, complex and onerous tax systems, and labor market rigidities.

Therefore, exceptions aside, these indicators suggest that Latin American countries lag behind in competitiveness. Although these rankings should not be taken at face value given that they are based on qualitative and subjective surveys, these indicators serve as a reference to assess cross-country differences in competitiveness. A key element of competitiveness is, of course, productivity, which we review next.

The Dynamics of Productivity

Total factor productivity (TFP) has had a marginal contribution to growth in Latin America, and at times has even led to important GDP contractions.[4] Even though factor accumulation seems to be the main driver of growth in Latin America, investment rates are still shy of 20% of GDP.

This experience contrasts with that of the most dynamic and successful economies, such as the East Asian Tigers, Ireland, or Finland. During their initial stages of development, these economies posted high factor accumulation, which ultimately underpinned GDP growth[5]; nonetheless the contribution of TFP as an engine of growth gained importance over time. More recently, in the cases of Finland and Sweden, for example, TFP replaced factor accumulation as the main source of GDP growth, as shown in Table 2. The same thing happened in Ireland during the eighties. However, it is worth noting that productivity led growth in these countries has not meant a reduction of investment rates, but rather the opposite: investment rates remain fairly high in most cases.[6]

Table 2. Factor accumulation and TFP contribution to growth, selected countries and periods (%)

		Australia	Ireland	Finland	Sweden	Singapore	Latin America
1960-1970	Accumulation of factors	67.91	48.50	46.36	49.14	83.60	70.38
	TFP	32.09	51.50	53.64	50.86	16.40	29.62
1970-1980	Accumulation of factors	77.77	65.59	72.96	115.12	91.38	81.52
	TFP	22.23	34.41	27.04	-15.12	8.62	18.48
1980-1990	Accumulation of factors	93.37	46.21	74.01	61.64	81.01	301.78
	TFP	6.63	53.79	25.99	38.36	18.99	-201.78
1990-2003	Accumulation of factors	72.65	61.62	20.35	39.22	84.95	105.98
	TFP	27.35	38.38	79.65	60.78	15.05	-5.98

Source: CAF (2006), Bosworth and Collins (2003)

In contrast, productivity gains in Latin America have been somewhat scant and erratic. Figure 2 shows that labor productivity in Latin America has declined significantly since 1980 compared with that of the United States.[7] This stands in stark contrast to more successful developed and emerging countries, where labor productivity has increased systematically vis-à-vis that of the United States. The decline in Latin America's labor productivity has also widened the income gap with respect to East Asian and certain European countries.

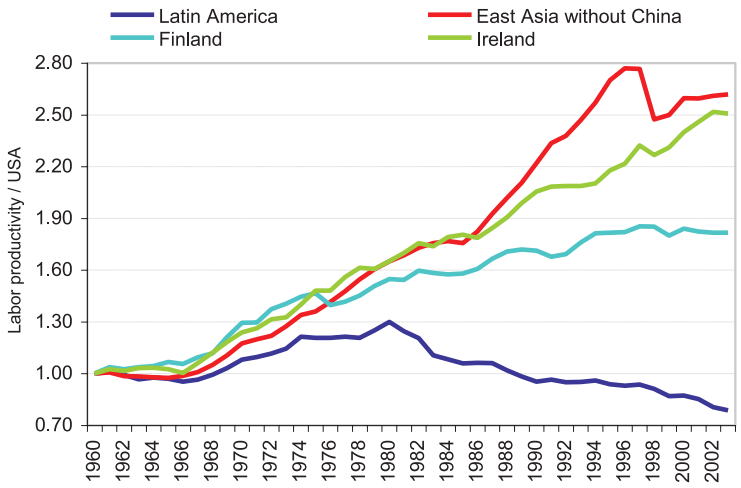
4 TFP is a broader indicator of productivity that measures the growth in ouput for given quantities of factors of production in a sector.

5 In Australia and Sweden, for example, during the sixties investment rates in physical capital approached 30% of GDP, while schooling rates exceeded eight years. In fact, factor accumulation was responsible for two-thirds of GDP growth in those countries during that period.

6 In Australia and Ireland, domestic investment amounted to 25% of GDP in 2003, while in the Asian countries, it stood at between 25 and 30%. Only in Sweden and Finland was investment as low as 17% and 20% of GDP, respectively, in 2003. In the Asian countries under study, factor accumulation continues to be the most important growth engine.

7 Labor productivity is defined as the ratio of output to number of workers.

Figure 2. Labor productivity relative to USA, by regions and selected countries (1960-2003)*

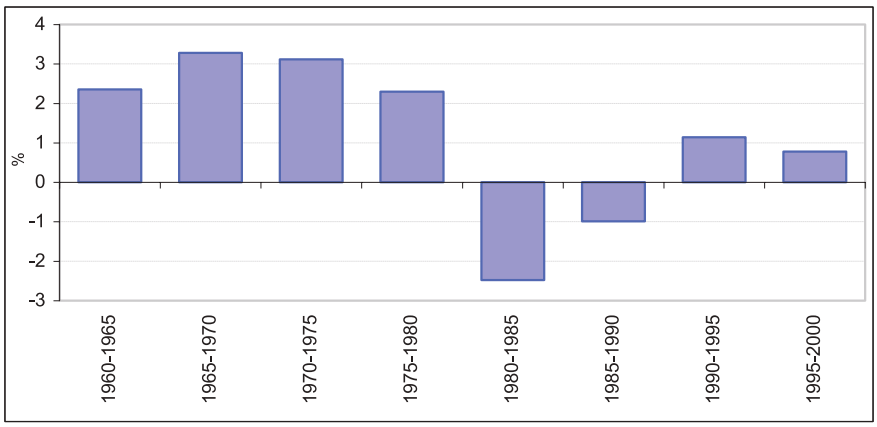


* Labor productivity index 1960=1

Source: CAF (2006), Bosworth and Collins (2003)

Two periods can be detected in the evolution of labor productivity in Latin America, one of slowdown and decline starting in the seventies, and even extending into the eighties, and another of incipient recovery as of the nineties (see Figure 3 showing the evolution of labor productivity in Latin America over the past 40 years).[8] Even so, as will be seen later, there are important differences in labor productivity trends among individual countries, particularly those that were hardest hit by financial crises in the late nineties or the turn of this decade.

Figure 3. Labor productivity growth in Latin America (1960-2000)



Source: CAF (2006), Bosworth and Collins (2003)

From a period with decreasing productivity gains (1970-1990), the region moved to a period of productivity recovery. The former corresponds to the period of import substitution industrialization, when, among other things, policies were adopted to protect the domestic economy by raising tariff barriers and through direct government financing of specific sectors. Even if Latin American industries did attain certain development and productive diversification, these improvements proved to be short lived, as the lack of market validation associated with protection only allowed low-productivity firms to survive (Edwards, 1994).

8 In fact, Latin American labor productivity dropped an average of 1.75% in the eighties, and in the nineties posted annual growth of only 0.95%, below the average rates of the fifties and sixties. The same pattern can be found when examining the evolution of total factor productivity.

Confronted by such disappointing results, Latin American countries embarked upon structural and market oriented reforms in the eighties and nineties. This policy shift produced an economic upturn in a number of countries during the first half of the nineties.[9] In fact, several authors have concluded that structural reforms had a significant impact on economic expansion in the region, with total factor productivity showing positive growth after decades of sluggish performance.[10]

A number of country level studies in Latin America shed more light on the different experiences, suggesting that trade openness and structural reforms may have contributed to productivity growth in Brazil, Colombia, Chile, Mexico and Uruguay.[11] However, recent productivity gains are still not enough to anchor sustainable growth and enhance participation in global markets. According to ILO (2004), by 2004 labor productivity in Latin America merely attained similar levels to those it observed in the early eighties.

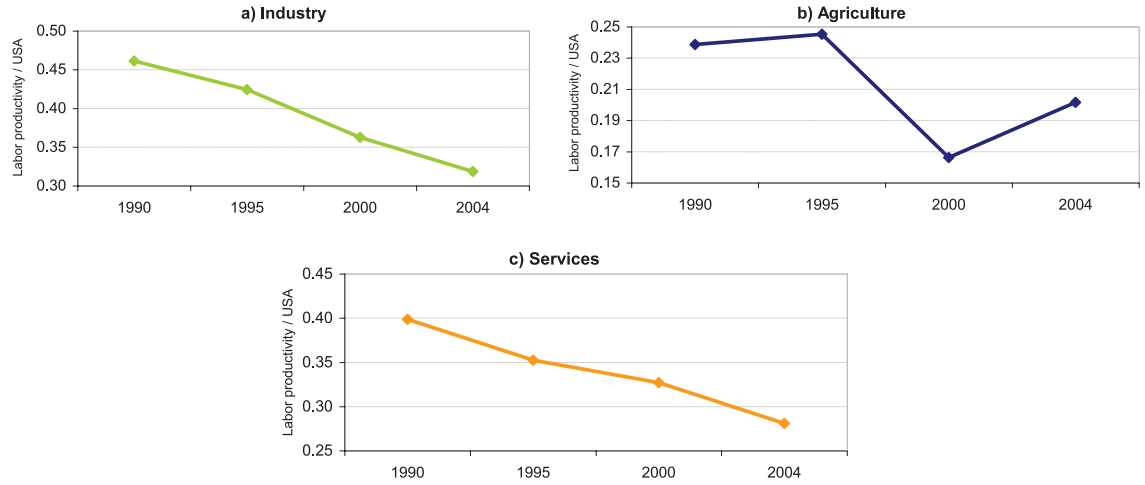
Labor productivity dynamics in Latin America contrasts with recent experiences in other countries. For instance, labor productivity in the United States exhibited a significant acceleration in the mid nineties, when non-agricultural labor productivity grew around 1.35 percentage points above the average in 1972-1995 (Jorgensen *et al.*, 2004). As a consequence, productivity in Latin America has declined relative to the United States. Figure 4 illustrates the evolution of labor productivity in the region in relation to the US for the industrial, agricultural and service sectors between 1990 and 2004. In each case, relative productivity has followed a clear declining trend.

9 Latin America's annual growth rate over the period 1990-1995 was 3.5%.

10 According to Fernández-Arias and Montiel (2000), the contribution of structural reform to long-term growth has been estimated at 1.63% for a typical Latin American country. The debate is still open, however, on the effective impact of the reforms, pitting those who consider the reforms were mistaken against those who consider the reforms were correct, but incomplete, inconclusive or poorly implemented.

11 Medina *et al.* (2003), for example, show that the decline of labor productivity in the industrial sector in Colombia during the second half of the nineties, was due to the reduction of technological progress, and that certain protectionist policies also seemed to have had a negative impact on industrial productivity. Casacuberta *et al.* (2004) study the evolution of industrial labor productivity in Uruguay and find that tariff reduction carried out in the early nineties was associated to a 3% increase in industrial labor productivity over that decade. On the other hand, Bonelli (2002) finds that trade openness and the changes in labor structure in Brazil had heterogeneous effects across productive sectors in that country. For the Mexican case, Diego-Baptist and Mendoza (2004) demonstrate that trade liberalization contributed to boost labor productivity growth in 1985-1998.

Figure 4. Labor productivity in Latin America (relative to USA) in agriculture, industry an services



Note: agriculture includes: agriculture, hunting, forestry and fishing. Industry includes: manufacturing, mining and construction. Services includes: financial services, electricity and water supply, commerce, hotels, communal services and transport.

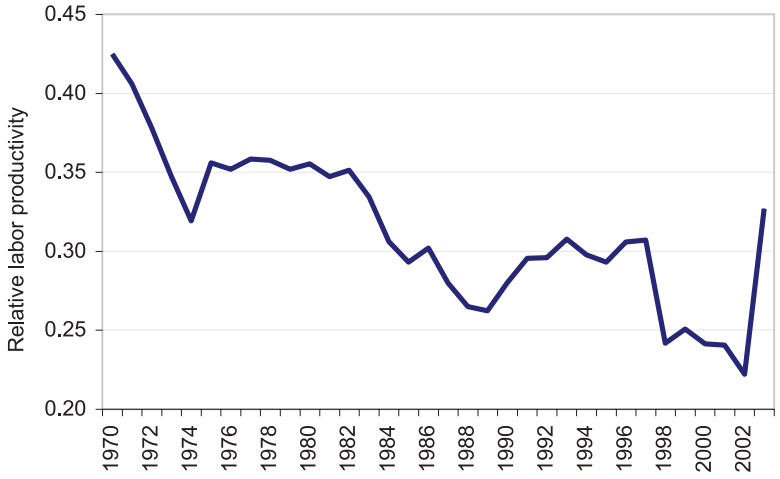
Source: CAF (2006), CEPAL (2005), World Bank (2006)

We next present a more detailed analysis of the evolution of industrial labor productivity in Latin America, since more data is available for this sector at a country level, allowing for a more comprehensive analysis.

Determinants of Industrial Labor Productivity in Latin America

CAF (2006) studies industrial labor productivity in Latin America using the PADI 5.0 data base compiled by ECLAC, which contains aggregate and industry level data per country since 1970. Figure 5 presents labor productivity in manufacturing for Latin America, relative to labor productivity in the United States.

Figure 5. Labor productivity in Latin America[a/] in manufacturing[b/]



[a/] Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, Venezuela. For Ecuador, Peru and Venezuela the data is available until 1994, 1996 y 1997, respectively.

[b/] Relative to labor productivity in manufacturing in USA

Source: CAF (2006), PADI (version 5.0)

Figure 5 reveals that labor productivity in Latin America relative to the US in the manufacturing industry has lost ground over time. It is worth mentioning though, that productivity in Latin America showed signs of recovery since the early nineties, but these gains were insufficient to match up to the spectacular increase in industrial productivity in the US after the second half of the decade. At a more disaggregate level, the sectors

with larger relative gains were tobacco, printing and publishing industries, chemical industry, iron and steel, and nonferrous metals. At a country level, Chile and Argentina outperformed the rest of their regional peers.[12]

Table 3 displays the rate of growth in relative labor productivity across Latin American countries for selected periods. The aggregate productivity growth rate in manufacturing can change due to modifications in sector level growth rates or due to changes in the allocation of resources (i.e. labor) across sectors. Thus, if labor is relocated in sectors with higher TFP growth, this would imply an overall increase productivity growth in manufacturing. In other words, cross-country variations in labor productivity growth can result from differences in average productivity across industries or from better factor allocation between industries within countries.[13]

Table 3. Decomposition of the differences in labor productivity growth in manufacturing in Latin America relative to USA

	Differences in the labor productivity			Participation in the explanation of the differences in labor productivity					
				1970-1980		1980-1990		1990-2002	
	1970-1980	1980-1990	1990-2002	Allocation of resources	Average productivity	Allocation of resources	Average productivity	Allocation of resources	Average productivity
Venezuela a/	-0.02	-0.02	-0.01	1.07	98.93	5.45	94.55	157.66	-57.66
Peru b/	-0.01	-0.03	-0.01	1.33	98.67	3.91	96.09	27.91	72.09
Mexico	-0.01	-0.02	-0.04	1.53	98.47	5.49	94.51	49.93	50.07
Ecuador c/	-0.01	-0.03	-0.01	1.48	98.52	3.67	96.33	31.57	68.43
Colombia	-0.01	-0.02	-0.04	1.38	98.62	6.26	93.74	64.70	35.30
Chile	-0.01	-0.02	-0.04	1.87	98.13	5.07	94.93	94.20	5.80
Brazil	-0.01	-0.02	-0.04	1.42	98.58	5.52	94.48	43.12	56.88
Bolivia d/	-0.02	-0.02	-0.03	0.85	99.15	4.35	95.65	64.05	35.95
Argentina	-0.01	-0.02	-0.02	2.03	97.97	5.79	94.21	67.47	32.53

Note: The last period ends in a/ 1997, b/ 1996, c/ 1994 and d/ 2001.

Source: CAF (2006), PADI (version 5.0)

According to this analysis, the differences in relative labor productivity growth predominantly stem from countries in the region having a lower average productivity compared to the US. Nevertheless, towards the nineties factor allocation gained more relevance, a fact which is consistent with larger productivity gains in those sectors with a larger share of employment.

One can still go a step further to assess whether changes in labor productivity growth are associated to technological changes within sectors, or to static and dynamic effects resulting from factor reallocation between sectors. Productivity growth can be separated into: i) within-sector growth, that is to say, changes in productivity due to firms in a particular sector becoming more or less productive; and ii) effects generated from structural changes, namely, effects stemming from static and dynamic changes derived from the reassignment of resources between sectors.[14]

Table 4 displays the decomposition of labor productivity growth for a sample of Latin American countries for the period 1970-2002. In general, productivity growth is mostly explained by changes that arise within sectors, that is to say, when companies within a sector become more productive (within-sector effect). Thus, within sectors changes explain more of 90% of overall changes in productivity since 1970 for most countries of the sample.

12 In both countries, over two thirds of the sectors analysed attained higher relative productivity in 2002 than in 1990.

13 One should expect a better resource allocation the larger the correlation between productivity and industries' share of employment.

14 Static effects measure the growth in productivity as workers move from low-productivity to high-productivity sectors at the beginning of the period. In turn, dynamic effects capture the impact on productivity of migration towards sectors with larger labor productivity growth rates in time.

Table 4. Decomposition of annual productivity growth

	Annual labor productivity growth	Percentage of the labor productivity growth explained by:		
		Intra-firm effect	Static change effect	Dynamic change effect
Argentina				
1970-1980	2.61	91.61	11.43	-3.04
1980-1990	1.09	84.51	7.39	8.11
1990-2004	5.04	108.64	5.60	-14.24
1970-2004	**3.18**	**97.68**	**5.76**	**-3.44**
Bolivia				
1970-1980	-2.64	138.29	-12.25	-26.04
1980-1990	-1.56	137.07	17.79	-54.87
1990-2001	3.65	129.32	-5.08	-24.24
1970-2001	**-0.07**	**285.49**	**-127.74**	**-57.75**
Brazil				
1970-1980	1.24	102.85	18.21	-21.07
1980-1990	1.22	71.43	21.29	7.28
1990-2002	3.49	104.35	2.86	-7.21
1970-2002	**2.19**	**99.54**	**5.58**	**-5.11**
Chile				
1970-1980	2.47	72.72	43.00	-15.73
1980-1990	0.10	930.59	-478.13	-352.46
1990-2002	3.93	85.71	20.45	-6.16
1970-2002	**2.40**	**96.30**	**16.04**	**-12.33**
Colombia				
1970-1980	0.88	74.90	26.54	-1.44
1980-1990	2.29	120.48	-3.86	-16.63
1990-2002	4.46	112.30	2.37	-14.67
1970-2002	**2.81**	**107.65**	**1.62**	**-9.27**
Ecuador				
1970-1980	0.93	76.88	7.29	15.82
1980-1990	-3.90	98.62	-2.59	3.97
1990-1994	1.52	111.37	12.36	-23.74
1970-1994	**-1.01**	**108.68**	**-16.21**	**7.54**
USA				
1970-1980	3.30	102.46	0.14	-2.59
1980-1990	3.34	99.83	4.44	-4.28
1990-2003	4.60	102.81	1.51	-4.31
1970-2003	**4.04**	**105.55**	**1.35**	**-6.90**
Mexico				
1970-1980	2.21	94.74	9.28	-4.02
1980-1990	1.28	84.74	37.01	-21.75
1990-2002	2.89	124.66	-7.70	-16.96
1970-2002	**2.30**	**108.93**	**6.62**	**-15.55**
Peru				
1970-1980	0.58	16.22	97.57	-13.79
1980-1990	-5.02	64.94	5.83	29.23
1990-1996	2.54	119.71	-11.84	-7.88
1970-1996	**-1.15**	**47.32**	**-28.81**	**81.48**
Venezuela				
1970-1980	-0.89	116.97	-33.37	16.40
1980-1990	0.62	45.05	2.71	52.24
1990-1997	4.21	110.42	-4.69	-5.74
1970-1997	**1.55**	**107.12**	**5.09**	**-12.21**

Source: CAF (2006), PADI (version 5.0)

Moreover, this effect compensated for the negative impact of structural changes on productivity.[15] In Chile, nearly 80% of labor productivity growth was explained by technological changes during the period 1991-2001, while 20% can be attributed to resource reallocation from less productive sectors towards more productive ones. It is important to mention, however, that results from labor productivity growth decompositions vary according to the specific periods selected, the temporal horizon, and the methodology used to compute labor productivity. Yet in spite of these differences, most studies conclude that within-sector or within-firm effects tend to be more relevant.[16]

Within-sector productivity growth has been sluggish in Latin America due to limited technology adoption and frontier innovation, compared to other economies. It seems that the region is not fully seizing the advantages of technological transfer through trade, foreign direct investment, and patent acquisitions. An indication of this is the

15 The only exception is Peru, where structural factors that explain labor productivity growth had a significant importance (they explain around 50% of growth).

16 For example, Foster *et al*. (1998) demonstrates that dynamic effects could take between five and ten years to materialize.

low investment rates in Research and Development (R&D) in Latin America, compared to emerging Asian economies, such as South Korea and Singapore, and Scandinavian countries (De Ferranti *et al.*, 2003). This is displayed in Table 5.

Table 5. R&D Expenditure as GDP % (2003)

Country	R&D Expenditure as GDP %
Argentina	0.5
Bolivia[a/]	0.3
Brazil	1.0
Chile	0.6
Colombia[b/]	0.2
Costa Rica[c/]	0.4
Ecuador	0.1
Mexico[a/]	0.4
Nicaragua[a/]	0.1
Panama	0.3
Peru	0.1
Uruguay[a/]	0.3
Venezuela, RB	0.3
Latin America[a/]	**0.6**
Australia[a/]	1.6
Canada	1.9
Korea, Rep.	2.6
Finland	3.5
Hong Kong[a/]	0.6
Malaysia[a/]	0.7
Norway	1.7
New Zeland	1.2
Singapore[a/]	2.2
Sweden	4.0

[a/] 2002
[b/] 2001
[c/] 2000

Source: CAF (2006), World Bank (2006)

If R&D investment is suggestive of a country's innovation efforts, the number of patents registered by the residents of a country is an indication of its success. Table 6 expresses the number of patents registered per million of inhabitants in Latin America, and a sample of other benchmarks. The table shows two measures: the number of patents registered by the residents of a country, and the number of patents registered by the residents of that country in the United States. The advantage of the second type of measure is that it abstracts from the possible different standards of patents granted across countries. In addition, the patents granted in the US can be considered a better indicator of frontier innovation, whereas the domestic patents are more related to technology adoption and adaptation.

Table 6. Registration of foreign and domestic patents (N° of patents per million of inhabitants, 1996-2000)*

Country	Domestic Patents (per million of inhabitants)	Registered Patents in EEUU (per million of inhabitants)
Argentina	4.7	1.8
Bolivia	0.4	0.2
Brazil	2.3	0.7
Chile	2.4	1.1
Colombia	0.4	0.3
Costa Rica	-	2.1
Ecuador	0.2	0.2
El Salvador	0.1	0.1
Honduras	0.3	0.5
Mexico	0.9	1.0
Nicaragua	0.4	0.1
Panama	2.5	0.5
Peru	0.4	0.2
Trinidad and Tobago	1.3	0.7
Uruguay	1.7	1.2
Venezuela, RB	1.6	2.0
Latin America	**2.1**	**0.8**
Australia	96.1	49.0
Canada	26.8	138.3
Korea, Rep.	283.6	81.0
Finland	133.6	160.0
Hong Kong	1.5	27.8
Malaysia	1.5	1.8
Norway	71.7	66.0
New Zeland	80.4	38.3
Singapore	113.1	48.4
Sweden	184.3	208.6
* Promedio anual		

Source: De Ferranti *et al* (2003)

There is little patent registration activity in Latin America compared to the other countries in the sample. Even in the four countries with more active patent development (Argentina, Chile, Costa Rica, and Venezuela), the number of registered patents in the United States is significantly inferior to that of South Korea, Hong Kong and Singapore. Additionally, most countries in Latin America have patent registration rates below the expected ones according to their income per capita (De Ferranti *et al.,* 2003). Thus, the region's performance on innovation in the last few decades has been disappointing, which does not do much in terms of closing the productivity gap.

On the other hand, structural factors constitute a more relevant source of productivity gains in other economies. For example, CAF (2006) finds evidence for Norway, Finland, Hong Kong and China, to support the claim that most labor productivity gains stem from structural factors, particularly dynamic ones. In addition, factor reallocation within economic sectors has been the main cause of labor productivity growth in manufacturing in India, Indonesia, South Korea, and Taiwan during the period 1963-1993 (Timmer and Szirmai, 2000).

Therefore, it seems that changes within sectors –the main determinant of productivity gains in Latin America– have not been sufficient to raise productivity and competitiveness to the standards achieved by other emerging economies. Therefore, it is imperative that countries in the region further increase productivity gains not only

through technological changes within sectors, but through structural margins, that is to say, through improvements in the allocation of resources between sectors. In this sense, the region faces the challenge of designing appropriate policies to increase productivity through a more efficient resource allocation as well, in order to reverse the declining trend in relative productivity. We will cover this in the next section.

3. Public Policy Options to Improve Competitiveness and Productivity

Latin American countries face important challenges to improve competitiveness and productivity, and ensure economic growth. Even though the main responsibility lies on firms, the State has a fundamental role in creating a competitive environment where firms can add value, appropriate the returns on their investments, and improve factor productivity. The provision of certain public goods is crucial to reduce transaction costs, correct prevailing market failures, and offer basic services not rendered by the market.

An indicator of the success of public policy intervention is its permanence in time. This, in turn, will depend on the institutional design underlying public intervention, the creation of proper incentives, and the provision of financial resources and managerial capabilities associated with policy implementation. In order for a particular public policy to persist in time it is necessary that it acquires the rank of State policy. In the case of the East Asian countries, for example, many development strategies were based on explicit agreements about the policy in question and its goals, pursuing consensus among economic agents, and ensuring its continuity over time.

In addition, effective public intervention demands fluid communication between the public and private sector, to reduce the probability of rent-seeking that may derive from a close relation between the government and private firms. In this sense, institutional checks and balances and greater accountability improve the quality of public intervention and reduce the chance of capture. Effective intervention mitigates coordination failures and generates mechanisms for information to flow among the agents involved.

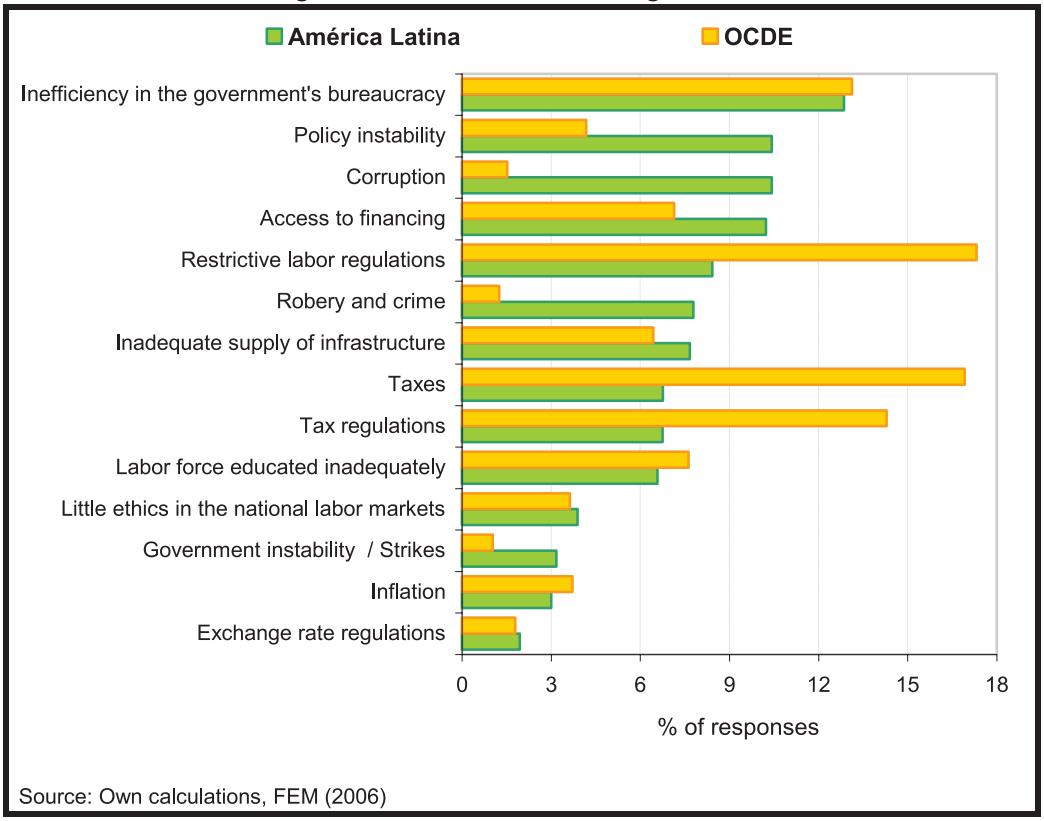
As was mentioned previously, the effects of trade openness have been extensively studied and the region has significantly advanced in this area. For example, CAF (2005) thoroughly studies the impact of trade liberalization on development in Latin America and suggests a policy agenda to strengthen competitiveness and further reduce barriers that hinder access to global markets. In this paper though, we want to center our attention on areas where the region still exhibits considerable gaps relative to emerging Asia and that have recently become the centerpiece of CAF's research agenda. Thus, we will look at public regulation to strengthen institutions, policies to encourage innovation and factor mobility, and to improve education, assessing in each case the actions to be undertaken so that improvements in these areas contribute to the further advancement of productivity growth and competitiveness in Latin America.

Building Institutions for Competitiveness

Regarding institutional development, Latin America considerably lags behind industrialized countries and even some developing regions. Red tape still implies substantial costs for firms in terms of time and resources. This especially affects small firms, since the workings of the legal system is complex, making the fulfillment of contracts more costly. The effectiveness of competition-promoting policies is also comparatively limited in certain Latin American nations than in other regions.

A problem frequently mentioned by Latin American entrepreneurs is that they face a series of regulatory barriers that hinder their growth potential. According to the World Bank (2000), regulatory problems, uncertainty and volatility of public policies, are among the main reasons for concern amongst firms in Latin America (Figure 6). Heavy tax burdens and high costs of complying with regulations are among the main concerns of medium and small sized firms; for 36.1% of these firms heavy tax and regulation burdens represent the larger obstacle (as opposed to 21.3% for large firms) and represent a larger share of the costs of smaller firms.

Figure 6. Critical factors for doing business



Source: Own calculations, FEM (2006)

One of the main concerns of entrepreneurs in the region is the instability of public policies, which is significant in Latin America (World Bank, 2000). Policy instability creates economic uncertainty, which is detrimental for investment because it generates high transaction costs for firms. Frequent and unexpected changes in public policies reflect institutional weaknesses. As may be expected, policy volatility is more pronounced in politically unstable countries, which signals the difficulty of undertaking long-term agreements between political and economic agents in society. This prevents adequate strategic planning by firms, and the consolidation of long-term relations between firms, suppliers, customers, and the government, which obviously takes a toll on productivity.

The development of appropriate institutions is crucial, considering that the institutional framework is a key element in the business environment. Depending on its design, institutions can stimulate productive activity or impose costs that inhibit it, or reduce efficiency and competitiveness. This usually happens in the presence of government failures.

Other fundamental institutional issues include the simplification and rationalization of administrative procedures, the formalization of companies, and easing of licensing permits. The participation of the private sector in simplifying administrative procedures is fundamental, as a source of valuable information and experience. The international

experience suggests that reforms must start by modest changes, i.e. the elimination of redundant procedures, form standardization, or information dissemination. Furthermore, it is necessary to guarantee property rights and contract fulfillment, complemented by adequate mechanisms that facilitate conflict resolution. All these are items of a public policy agenda oriented to improve the institutional quality to support competitiveness.

Public Regulation and Productivity Growth

In this section we discuss public regulation to enhance productivity growth. Competition benefits productivity growth through: i) the reduction of production costs by improving product and process innovation; ii) the reassignment of market shares from less dynamic and productive firms towards more innovating firms; and iii) the entrance of new and more competitive firms compared to already established ones (Aghion and Schankerman, 2004). In this sense, by establishing the proper incentives to promote innovation and more efficient resource allocation, regulation can enhance productivity growth. As was mentioned in the introduction of this paper, Latin America still lags behind more dynamic emerging economies in terms of competitiveness and, to a large extent, this has to do with regulation.

Innovation, Competition, Investment Environment and Regulation

Innovation processes, either by developing new technologies or adopting frontier ones, constitute an important source of productivity gains and competitiveness, by allowing more efficient production of goods and services. By altering innovation incentives, regulation also has dynamic effects that alter productivity trends over time.[17]

There is a consensus that regulation oriented to strengthening competition is compatible with higher productivity: competition-promoting policies help develop product and process innovation (Tolosa and Borrell, 2005). However, many barriers that hinder competition still prevail in the region relative to more successful industrialized and East Asian economies (Cole *et al.*, 2004).

Cross-country differences in productivity can largely be explained by differences in the investment climate and the microeconomic environment (political, institutional and regulatory) where firms operate. A better business environment should lead to improvements in firm performance and productivity, especially if the proper incentives are set in place, and property rights are protected.

Factor Mobility, Firm Turnover and Regulation

Regulation may also have an important impact on productivity by setting incentives that alter the efficiency of resource allocation within industries and firms, and between them. Policies oriented to reduce trade barriers may generate factor reallocation towards more competitive firms, the exit of less competitive firms, and an expansion in productivity growth (Bernard *et al.*, 2003). In contrast, cumbersome regulatory frameworks have negative effects on productivity, as well as on per capita output.[18] Consequentially, regulation can affect market structures and productivity. For example, a more competitive environment creates incentives to eliminate distortions and promote

17 Schumpeter (1942) indicates that market reform policies affect not only productivity levels, but also its rate of growth. This is due to the fact that competition stimulates innovation and elaboration of new products. Therefore, introducing regulations that alter the process of resource allocation between firms (mainly to more competitive ones) can generate adverse economic effects at the aggregate level. In the case of the monopolies, Schumpeter argues that excess profits generate additional incentives to innovation. In this sense, regulation that affect firm revenues may have negative effects on innovation and growth.

a more efficient resource allocation. This translates into productivity gains as long as the legal framework does not create undue barriers to factor mobility (Nickel *et al.*, 1997).

A recurrent question in the literature is whether productivity gains at an aggregate industry level stem from technological changes within firms (i.e., existing firms becoming more productive), from more productive firms gaining ground in market share, or rather depend on entry/exit barriers. With some exceptions, a common finding is that aggregate productivity patterns stem largely from within-firm productivity dynamics.[19] Another broad conclusion is that there are significant differences in total factor productivity across firms and that these differences are reflected in turnover patterns, which tend to differ across countries. For developing nations, the evidence suggests that exiting plants are less productive than surviving ones and entering plants are less productive than more experienced incumbents. However, as new plants mature their average productivity tends to increase for several years until they reach industry standards.

Regulation and the institutional framework also play a role in product and labor markets. For example, industrial productivity in OECD countries is negatively affected by strict product market regulations, especially if there is a significant technology gap relative to the leading technology. Likewise, high hiring and firing costs seem to hinder productivity, especially when these costs are not offset by lower wages or more training. Moreover, burdensome regulations on entrepreneurial activity and high costs of adjusting the workforce seem to negatively affect the entry of new small firms (Scarpetta *et al.*, 2002).

In this context, acknowledging the importance of flexible factor markets has been one of the justifications for the adoption of structural reforms in Latin America. In fact, many countries in the region introduced market reforms during the nineties that also extended to labor markets.[20] For example, in terms of the effects of labor market reforms on productivity at the country level in Colombia, Eslava (2005) finds that such adjustments seemed to be positively correlated with aggregate productivity, although results vary according to the different adjustment processes that took place across markets.

In light of these arguments, policy makers should keep in mind that in order to prop up productivity growth, regulation should create incentives for firms to invest in innovation, either by adopting frontier technologies or developing them. It should also be compatible with factor mobility, so that resources are efficiently allocated, thereby facilitating productivity gains and ultimately increasing competitiveness.

Innovation Policies

The fact that knowledge is a public good and innovation creates positive externalities, justifies public intervention in order to set appropriate incentives to increase investment in these activities. In developing countries, governments face the challenge to select public policies to overcome market failures that prevent innovation, without introducing new distortions. From this point of view, and given the increasing importance

18 In this sense, Blanchard and Giavazzi (2003) emphasize the role that regulation plays when it reduces entry costs. These policies permanently drive profit margins down, which increases employment and real wages.

19 Entry, exit, and market share reallocations across firms or plants within an industry contribute very little to productivity growth, generally because there are only small productivity differences between entering and exiting plants or these groups account for a very small share of industry output.

20 These processes generally included openness to trade, labor markets flexibilization, improving the institutional framework and better prudential regulation for the financial sector, among others.

of innovation systems, globalisation and production, and innovation networks, there is an important scope of action for public policies in terms of facilitating communication and organization between agents, and eliminating coordination failures.

Public policy options for innovation include three lines of action. In the first place, policies should strengthen the institutional and social capital of national and regional systems of innovation. The primary target must be to stimulate the links between all actors involved in the innovation process (namely, universities, firms, governments, among others) in order to improve efficiency. Government policies must also play a leading role in articulating national and regional innovation systems, so that regional firms get access to national and international innovation networks.

Second, public policies should be directed to build up innovation capacities by promoting scientific research and human capital formation, through schooling and job training. Third, the government can play an important role providing financial assistance for innovation. One of the main obstacles faced by research and development activities is the limited availability of formal financial sources. Information asymmetries and uncertainty are at the root of this problem, preventing highly innovative clients and start ups from accessing formal credit. Efforts should thus be oriented to develop more suitable financial mechanisms for these activities, namely venture capital investors, angel investors, and joint ventures. The use of direct fiscal incentives to promote innovation could also be effective in supporting innovation.

The Role of Education on Productivity

The effect of education on productivity and growth has been widely explored in the economic literature. The link between education and growth is based on the notion that education has spillover effects, i.e., the education of some members of society benefits not only them but the rest of society, by increasing productivity and thereby growth and social benefits.[21] Empirically, there is a positive relation between the human capital accumulation (education) and economic growth.[22] Moreover, high quality human capital accumulation seems to be one of the most relevant determinants of productivity.

Notwithstanding, Aghion *et al.* (2005) suggest that investment in human capital can have positive or negative effects on economic growth depending on the combination of two factors: the level of education and the proximity of a particular economy to the technological border. For the case of US states, these authors find that investment in high-level education (i.e., the type that generates innovation and shifts the technology frontier) has a positive impact on growth in states that are near the technology frontier. On the other hand, investment in technical-level education has a positive impact in those states further away from the frontier. Perhaps one of the most important findings of the study is that investment in high-level education in technologically backwards states has a negative impact on economic growth, basically because the effect on productivity is very small in comparison with its potential use in alternative activities (e.g. public infrastructure). In addition, individuals with sophisticated education usually migrate from backwards states towards the technologically more advanced states, where their human capital is more productive.

21 Romer (1986) and Lucas (1988).

22 Barro (1991) and Mankiw *et al*. (1992).

This evidence is highly relevant for Latin America, since it may well provide a rough blueprint to think about policy intervention. First, productivity-enhancing investment in education should not be generic. Instead, it should be country and sector specific, in attention to comparative advantages and the distance from those sectors to the technology frontier.[23] In innovation prone and technologically advanced sectors or economies, investment in high-level education will be most beneficial in terms of the higher impact that may be expected on productivity and growth. On the contrary, in sectors or economies that are further apart from the technology frontier, it will be more profitable to invest in technical-level education that facilitates imitation processes and technology adoption to accelerate productivity growth.

Successful experiences in East Asian countries began by processes of technology adoption (imitation), which was an important step to eventually reach the technology frontier in many sectors (Song, 2000). In sectors and activities where countries are near the technology frontier by virtue of their comparative advantages, public policies could contribute to the process of innovation by supporting specialized human capital accumulation in such areas.

Furthermore, a small number of professionals in science and technology may limit the process of technology adoption and innovation. The report on education and technology gaps of the World Bank (2002) shows the relationship between the number of engineers and scientists by each 10,000 workers and output per capita in a sample of 110 countries. It concludes that, in fact, there exists a positive and significant correlation between the number of professionals in science and technology and the level of development of the countries. In addition, it shows that Latin America has a very low number of scientists and engineers compared with industrialized countries.

The role of science and technology professionals in the process of economic growth has been emphasized when examining the successful experiences of South East Asian countries over the last 40 years. This has partly to do with the fact that industrialization processes in these economies initially implied strong investments in this type of human capital to underpin technology adoption; with time though frontier innovation took more prevalence.

The natural question at this point is whether Latin America has the appropriate combination of professionals nowadays to boost productivity and competitiveness in order to recover the lost ground in international markets. Table 7 shows the distribution of university graduates by specialization in Latin America and the US.

Although the categories are not exactly corresponding, the data allows for some interesting comparisons. A striking fact is that in Latin America 16.9% of the university graduates are engineers (or of a related profession), whereas in the US this number is just 6.2% for college graduates and 6.3% for individuals with masters degrees. Nevertheless, the United States is in the technology frontier of the world, while Latin America clearly lags behind in innovation. On the other hand –and here the categories are more diffuse– 27% of Latin American professionals are specialized in the social sciences and law,

23 A key issue would obviously be the determination of the appropriate technology frontier for Latin American countries. In the US, the technology frontier can be defined using the state with the highest income per capita. Nevertheless, it is not clear that the country with the highest per capita income is the most suitable reference.

Table 7: University graduates by area of concentration, Latin America and USA (%)

Latin America		USA		
Branch of Knowledge	**Bachelors (1994)**	**Branch of Knowledge**	***Bachelors* (1998)**	***Masters* (1998)**
Education	12,38	Education	8,95	26,66
Liberal Arts	7,03	Psychology	6,25	3,20
Social sciences and law	27,05	Social sciences and history	10,56	3,47
Economics and administration	15,49	Business, administratives services and marketing	19,68	23,75
Medicine and health	12,10	Health-related professions	7,12	9,13
Basic sciences	5,32	Biological and basic sciences	5,56	1,46
Engineering and technology	16,85	Engineering and related technologies	6,24	6,30
Agriculture	2,98			
Others	0,80	Others	35,64	26,03
Total	**100,00**	**Total**	**100,00**	**100,00**

Source: Schwartzman (2002)

compared to only 10% of American graduates. However, the category "others" accounts for less than 1% of the professionals in Latin America and more of 35% in the United States, which means the region has a limited range of professional degrees compared to that of the United States. Thus, the categories that embody 99% of the professions in Latin America, gather up to 65% of the options in the US.

This suggests that countries need not over-emphasize the importance of professionals in the fields of engineering and technology, but rather should concentrate on the complementarities between the productive process and the diversity of professional activities it demands. The United States has a well diversified economy, and many sectors and activities are in the technology frontier; therefore, it has a correspondingly diversified supply of professionals. On the other hand, Latin America, having a limited diversification of activities, has also a more concentrated professional supply.

Another element to consider is that the expansion of high-school and elementary education and in Latin America has dramatically increased the demand of college education. This demand has been partly satisfied by a substantial increase in the number of private universities. In particular, the International Institute for University Education for Latin America and the Caribbean of UNESCO (IESALC) indicates that whereas in 1994 around 38% of university enrollment in the region corresponded to private institutions, by 2003 this number exceeded 46%. In contrast, in 1960 private enrollment was only around 16% of total enrollment.

Human and physical capital are complementary in production. This means that high-skilled workers will generally be more productive in firms with better equipment and infrastructure. This implies that the strategies of professional training in lesser diversified economies, like Latin American ones, must put emphasis in the areas where the economy can really offer attractive job opportunities, and mitigate the incentives for human capital flight. This does not mean that professional training must be limited only to the economy's internationally competitive activities, but rather that emphasis should be put into improving the quality of professional training in areas where innovation and productivity gains are more likely.

The East Asian experience has been consistent with this logic. Human capital flight was significant in those countries until they managed to consolidate economic sectors that offered attractive professional opportunities, as was the case in South Korea and Taiwan. Initially, these posts aided processes of technology adaptation that in time became the basis for further development of production conglomerates and associations between research centers and the private sector, which eventually pushed the international technology frontier in those areas.

The evidence presented previously, suggests that in activities where countries are far from the technology frontier, policies should concentrate efforts to improve the quality of average high-school and elementary education in order to facilitate adoption of technologies and imitation. On the other hand, in sectors with great export potential and relative proximity to the technology frontier, countries must promote high-level education to support innovation and thereby enhance productivity and competitiveness.

4. Conclusions

This paper has presented a brief assessment of productivity and competitiveness in Latin America. In spite of the buoyant macroeconomic performance of the last few years, income gaps with respect to developed and emerging East Asian economies do not seem to be closing up. Instead, productivity and competitiveness breaches prevail and appear to be holding the region back.

On the one hand, Latin America lags behind emerging economies, not to mention developed ones, in technology adoption and frontier innovation. This limits productivity gains that may be attained via technological progress. On the other hand, productivity gains through factor reallocation across sectors remain bleak. This is in stark contrast with emerging economies that became global competitors over the last decades (e.g. East Asian countries, Ireland or Finland), where productivity gains have been remarkable.

In consequence, lower productivity makes Latin American economies less competitive, restraining their access to increasingly globalized markets. There is still an ample scope of action for public policies to circumvent these deficiencies. At a domestic level, efforts should focus on strengthening the institutional framework, since the region clearly shows deficiencies in this area. Regulation in the region is still associated to higher transaction costs and fewer incentives to invest in innovation.

In order to promote innovation, regulation should be conceived to set the right incentives to invest in R&D, without introducing new distortions. Public policies should also be oriented to mitigate coordination failures among agents that intervene in the innovation process (academia, research institutions, firms, among others). Appropriate formal channels to fund innovation should also be supported, particularly those directed to small innovating firms and startups.

Education obviously demands new lines of policy action. As was discussed in this paper, a generic approach to quality education is not good enough. Apart from being a public good by itself, there should be a strategy behind human capital formation if it is to enhance productivity and growth. This strategy should be designed taking into account the distance that separates countries from the technology frontier and that education achievement should be compatible with markets dynamics. Neither under qualified or over qualified

workers will effectively contribute to underpin productivity and competitiveness.

Finally, there is scope for a policy agenda beyond national borders. International cooperation to improve productivity and competitiveness is already taking place in the region through a number of agreements and organizations, spanning a myriad of issues. Among these are worth mentioning, the Iberoamerican Programs for Science and Technology, the Iberoamerican School of Government and Public Policies, Iberoamerican Program for Quality, regional programs to support small and medium firms, the South American Initiative for Infrastructure Integration (IIRSA), and CAF's Competitiveness Support Program, among others. All these initiatives clearly have a large potential to support and complement domestic efforts to promote competitiveness and productivity, and enhance welfare.

Issues for Discussion

1) Designing institutions and regulation that effectively stimulate productivity, efficiency and competitiveness, demands the interaction with the private sector. In this sense, the private sector can participate at different levels of public policy action such as:

   - The identification and definition of priorities for public policy action at a broad level, where input from the private sector is fundamental to recognize the most pressing issues to tackle in order to enhance competitiveness.
   - Consultation for the design or alteration of regulation affecting the business environment---e.g., anti-trust regulation, red tape, etc. ---.
   - Simplification and rationalization of administrative procedures through direct private management. For example, private entities such as FUNDAEMPRESA in Bolivia and the Chambers of Commerce in Colombia are directly in charge of procedures such as the formalization of companies, licensing permits, etc.

   In this regards, which mechanisms should be promoted to facilitate private sector partaking in building institutions for competitiveness at these levels? What does the international experience suggest?

2) Regarding innovation policy, there are two key issues of possible joint action between the private and public sector in the region to promote innovation that could be addressed:

   - How to encourage appropriate formal channels to fund innovation, particularly those directed to small innovating firms and startups (e.g., venture capital investors, angel investors, joint ventures)?
   - How to mitigate coordination failures among agents that intervene in the innovation process (academia, research institutions, and firms, among others)?

3) As has been argued in this paper, there is scope for international cooperation in the pursuit of competitiveness and productivity enhancing policies. What has been the impact of several Iberoamerican programs (Science and Technology, Government and Public Policies, Quality), regional programs to support small and medium firms, the South American Initiative for Infrastructure Integration (IIRSA), and CAF's Competitiveness Support Program, among others? What obstacles have they faced? How to get the critical agents involved?

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