

Learning from China's Rise to Escape the Middle-Income Trap

A New Structural Economics Approach to Latin America

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Abstract

This paper discusses the causes of the middle-income trap in Latin America and the Caribbean, identifies the challenges and opportunities for Latin America that come from China's rise, and draws lessons from New Structural Economics and the Growth Identification and Facilitation Framework to help Latin America escape the middle-income trap. Countries in Latin America and the Caribbean are caught in a middle-income trap due to their inability to structurally upgrade from low value-added to high value-added products. Governments in Latin America and the Caribbean should intervene in industries in which they have a comparative advantage, calibrating supporting policies in close collaboration with the private sector through public-private sector

alliances. Through continuous structural upgrading in sectors intensive in factors such as natural resources, scientific knowledge, and unskilled labor, the region could achieve dynamic growth. This would require investments in education, research and development, and physical infrastructure. Therefore, industrial upgrading and diversification would be essential to avoid further de-industrialization arising from the competitive pressures of the rise of China, broaden the base for economic growth, and create the basis for further sustained reduction in unemployment, poverty and income inequality. Failure to do so would lead to a loss of competitiveness and risks of further de-industrialization.

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**Learning from China's Rise to Escape the
Middle-Income Trap**
A New Structural Economics Approach to Latin America

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I. Introduction

1. Since 2000, the world economy has experienced a burst of convergence, as developing countries have grown substantially faster than high-income countries. As a result, the world economy has entered a new era in which emerging market economies are the main drivers of global growth. This trend was reinforced after the 2007 global crisis by a recovery that has been characterized by a two-speed pattern, with growth rates in developing countries that have been more than twice those in high-income countries.

2. The dynamic growth of these emerging economies will engender tectonic shifts in the global economy that will provide new opportunities for both high-income countries and developing countries. For high-income countries, the growth of emerging economies will expand markets for their technology- and capital-intensive capital goods, intermediate goods, and services exports. For those developing countries that are major producers of agricultural and natural resource commodities, higher consumption and production levels will continue to support adequate prices for commodities and thus help their exports. Developing countries that are competitive in labor-intensive manufacturing are likely to benefit from higher demand for these goods in the new growth poles.

3. One of the most noteworthy features in the new world economy for Latin American and Caribbean countries is China's rise. This development has three major implications:

4. First, following years of high growth, China's wages in the manufacturing sector have been rising rapidly and its surplus labor has been diminishing. As a result, China's economy now faces pressure to upgrade its industrial structure and to enter capital and knowledge-intensive industries to maintain dynamic growth. As the industry of China upgrades to more sophisticated product markets, it will leave market space in labor-intensive industries that other developing countries could fill. In a repetition of the Flying Geese pattern that characterized the evolution of growth dynamics between Japan and the East Asian tigers on the one hand and the East Asian tigers and China on the other hand, enterprises in China are expected to relocate their existing production to other lower-wage countries as they upgrade to higher value-added industries (Lin 2011; Chandra, Lin, and Wang 2012).

5. Second, China's emerging middle class will give rise to a new and growing market for products from other countries. This boost in consumption will provide new export opportunities for both advanced and developing countries and could lead to an upward shift in the growth trajectory of the world economy.

6. Third, China's upgraded industrial structure may present growing challenges to the competitiveness of the manufacturing sector in other upper middle-income countries, particularly

those countries in Latin America. In fact, there is evidence that Latin America's manufacturing sector, especially Mexico's labor-intensive manufacturing sector, was crowded out by China's rising manufacturing sector in the past decades. Similar competitive pressures on the more capital- and technology-intensive manufacturing sectors that currently prevail in upper middle-income Latin American countries will inevitably emerge as China moves up the industrial ladder.

7. Since 2000, Latin America has achieved major progress in macroeconomic stabilization and structural reforms, leading to a period of sustained growth, declining poverty, and reduced inequality. Yet, many countries in the region remain trapped in a middle-income country status and challenges to sustained growth are emerging from the changing structure of the world economy. Against the background of these historic shifts in the global economy, this paper aims at proposing a growth strategy for Latin America based on New Structural Economics (NSE)² that would allow the region to confront the challenges and harness the opportunities of the new world economy.

8. The paper starts by reviewing the current state of the region's economy following the adoption of import-substitution strategies through the 1980s and policies under the Washington consensus since the late 1980s and contrasts the performance of Latin American economies to those in East Asia. It subsequently discusses key features of the rise in China and its impact on Latin America. Building on insights from New Structural Economics and lessons from the experience of East Asian economies in achieving industrial upgrading and diversification, it describes basic pillars of a growth strategy for Latin America that could lead the continent out of the middle-income trap and allow it to effectively counter the challenges and exploit the opportunities from China's ascent.

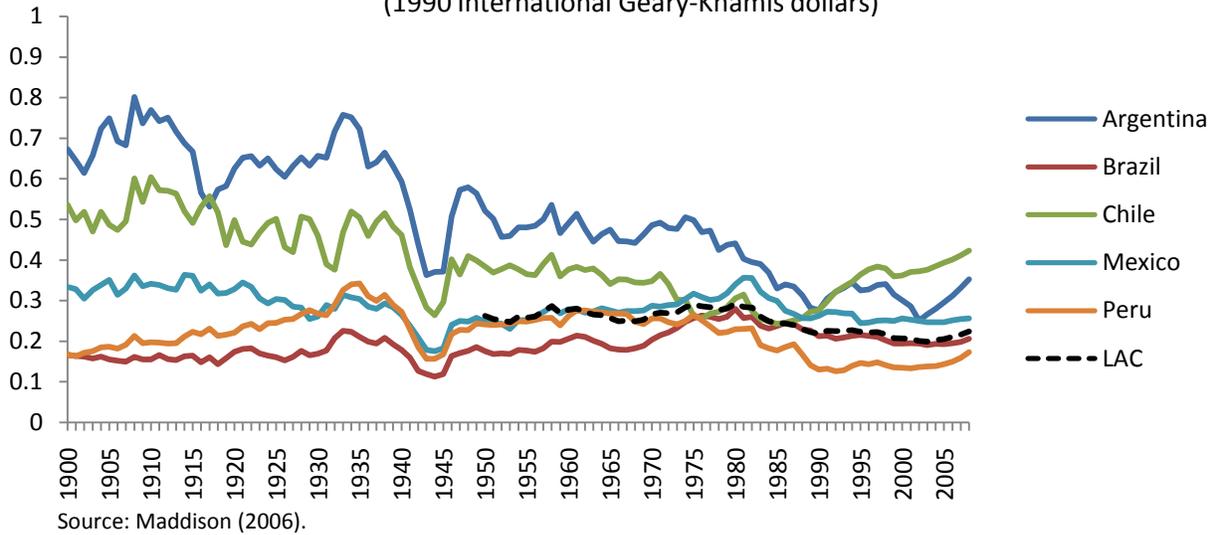
II. The Middle-Income Trap in LAC Countries

Latin America's growth performance in perspective

9. Although Latin American countries have made progress in recent years and improved their growth performance, they remain trapped in the middle-income status and have made little progress in converging to the per capita incomes of advanced countries. Figure 1 shows the ratio of per capita income in selected countries in Latin America to the per capita income of the United States. Following a decline for the region as a whole since 1982, the ratio has stagnated and only mildly risen from 2006. Yet, this development for the region masks sharp differences between individual countries. While the ratio of Argentina's per capita income as a percentage of the United States' showed a marked rise following the financial crisis in 2001 and the recent boom in commodities exports, the ratios of Mexico and Brazil stagnated. Chile's ratio rose largely as a result of the growth in natural resource exports.

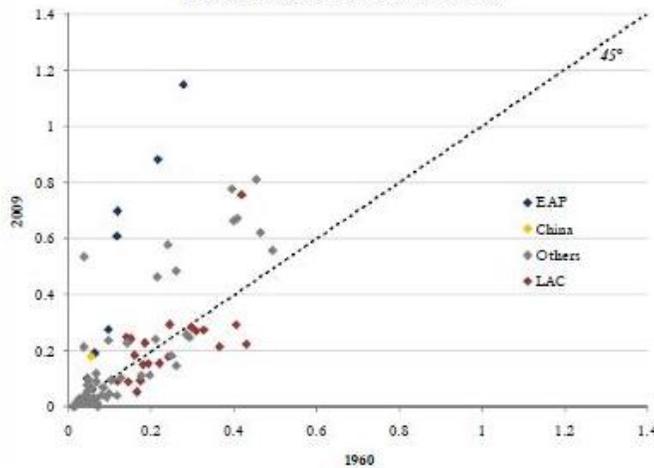
² New structural economics proposes to use the neoclassical approach to study the determinants of economic structure and its evolution in an economy. For further discussion see Lin (2012).

Figure 1: Ratio of Selected LAC Countries' GDP per capita to US GDP per capita
(1990 International Geary-Khamis dollars)



10. LAC's middle-income trap sets it aside from other regions, as illustrated by Figure 2 below which shows the PPP adjusted gross domestic product (GDP) per capita of several regions relative to that of the United States. While other regions, particularly East Asia, have made progress in closing the gap with the United States, LAC's ratio has progressed little from 1960 to 2009.

Figure 2: Middle Income Trap
PPP adjusted GDP per capita relative to the US
Countries with ratio lower than 0.5 in 1960



Source: Figure 1.7, Panel C from: World Bank (2011a).

What has been the cause of LAC's middle-income trap?

11. Economists have long been intrigued by the mystery of modern economic growth, typically observed through the seemingly divergent evolution of the change in per capita GDP among countries. Since 1820, the world growth rate has risen almost steadily, peaking during a “golden age” (1950–1973) when it averaged almost 3 percent per year (Maddison 2006). In the past two centuries, some countries have been able to catch up with the leading economies (such as Germany, France, and the United States in the late 19th century, and the Nordic countries, Japan and the East Asian Tigers in the 20th century). Moreover, in the 1980s and 1990s, the top five contributors to global growth were all G7 industrial countries, except for China. By 2009, however, all were emerging economies, except for the United States—with China the most important contributor (Lin 2011). This trend towards a multi-polar economy was further reinforced by the aftermath of the 2007–09 global crisis, recovery from which was primarily driven by the emerging economies.

12. One of the sources of this process of rapid growth was technological innovation. After the Industrial Revolution began in England in the mid-18th century, experiments became the major source of technological invention and innovation (Lin 1995). This was especially true for those macro-inventions that consisted of radical new ideas and involved large, discrete, novel changes, as defined by Mokyr (1990). For developed countries, these inventions were essential for technological advancement. With investment in research and development, innovation became endogenous. Industrial structures were upgraded continuously and productivity increased. As a result, developed countries began to take off and the divergence between the North and South appeared.

13. But such progress has been uneven across regions of the world, countries, and time. Sustained growth has led to improved living standards, first in Western Europe, North America, and Japan, and more recently in newly industrialized economies (NIEs) and other emerging market economies. Cross-country income distribution that initially widened (with the proportional gap between the richest and poorest countries growing more than fivefold from 1870 to 1990) has slowed in recent decades among groups of countries. With the narrowing of the top end of the distribution, there seem to be some “convergence clubs” among nations (Evans 1996). Still, many of the poorest countries—especially in Africa—are excluded from the convergence process.

14. Contrary to the prediction of most neoclassical models, convergence among world economies has been a limited phenomenon (Pritchett 1997). In 2008, GDP per capita in the United States (one of the world’s richest countries) was three times higher than per capita income in neighboring Mexico, 16 times higher than the per capita income in India, and 145 times the per capita income of the Democratic Republic of Congo (World Bank 2012a).

15. Modern growth theory has attempted to explain the diverging paths followed by world economies. Despite differences in approaches and methodologies, there is a wide consensus that the variation of living standards across countries and time mostly reflects differences in the rate of capital accumulation and the rate of productivity growth. Empirical studies carried out from the perspective of development accounting show that, productivity differences among countries

are the dominant explanation for income differences. Similarly, differences in productivity growth are the most important explanation for differences in income growth rates among countries” (Howitt and Weill 2010, pp. 43–44). Over the long term, productivity growth is associated with technological change³ and structural change—meaning that productivity growth is associated with reducing the costs of producing the same outputs using better knowledge and relocating resources from lower value-added industries to higher value-added industries.

16. It can therefore be said that continuous technological innovation, industrial upgrading, economic diversification, and an acceleration of income growth are the main features of modern economic growth (Kuznets 1966; Maddison 2006).⁴ But what are the factors that determine a country’s technology and structure of industries at any specific time and evolution over time?

17. The NSE postulates that each country at any specific time possesses given factor endowments consisting of land (natural resources), labor, and capital (both physical and human), which represent the total available budget that the country can allocate to primary, secondary, and tertiary industries to produce goods and services. The endowments in a country are given at any specific time but changeable over time.

18. Conceptually, it is useful to add infrastructure as a fourth factor endowment since it is an important additional component in an economy that is also fixed at any specific time and changeable over time (Lin 2012).⁵ Infrastructure includes hard (or tangible) infrastructure, such as highways, port facilities, telecommunications and power supplies, and soft (or intangible) infrastructure, such as law, regulation, and financial institution. Both these types of infrastructure are essential to the competitiveness of domestic firms because they affect transaction costs and the marginal rate of return on investment.

19. At any given point in time, *ceteris paribus*, the structure of a country’s endowment, that is the relative abundance of factors that the country possesses, determines the relative factor prices and thus the optimal industrial structure (Ju, Lin, and Wang 2011). With a competitive market system, a low-income country with abundant labor or natural resources and scarce capital will have a comparative advantage and be competitive in labor-intensive or resource-intensive industries. Similarly, a high-income country with abundant capital and scarce labor will have a comparative advantage and be competitive in capital-intensive industries. Therefore, the optimal industrial structure in a country, which will make the country most competitive, is endogenously determined by its endowment structure. For a developing country to reach the advanced countries’ income level, it needs to upgrade its industrial structure to the same relative capital-

³ Technology is defined here as knowledge (intangible intellectual capital) of how to transform basic inputs into final utility. It differs from human or physical capital by its non-rival nature. Efficiency is the way technology is used—with the goal of optimality, especially in the allocation of resources.

⁴ Maddison (2006) estimated that in Western Europe, the annual per capita income growth rate before the 18th century was about 0.05 percent, accelerated to about 1 percent in 18th and 19th centuries, and reached 2 percent in the 20th century. The required time for doubling per capita income thus reduced from 1400 years before the 18th century to 70 years in the 18th and 19th century and further to 35 years in the 20th century.

⁵ The difference between factors of production and infrastructure is that the supply and demand of the former are determined individually by households and firms, whereas the latter in most cases are supplied by the community or governments in a form that cannot be internalized in the decisions of individual households or firms, as they require collective actions.

intensity of the advanced countries. However, to achieve that, it must first close its endowment gap with that of the advanced countries. The strategy to get there is to follow its comparative advantage at each stage of its development. When firms choose to enter industries and adopt technologies that are consistent with the country's comparative advantage, the economy is most competitive. These firms will claim largest possible market shares and create the greatest possible economic surplus in the form of profits and salaries. Because of the competitiveness of its industries, re-invested surpluses earn the highest return, which allows the economy to accumulate even more physical and human capital over time. This dynamic can lead to a virtuous circle: it can upgrade the country's factor endowment structure as well as the industrial structure, and also make domestic firms more competitive in more capital- and skill-intensive products over time.

20. Latin American countries' middle-income trap is a result of their inability to continue the process of moving from low value-added to high value-added industries.

What have been the main features of Latin America's economic performance?

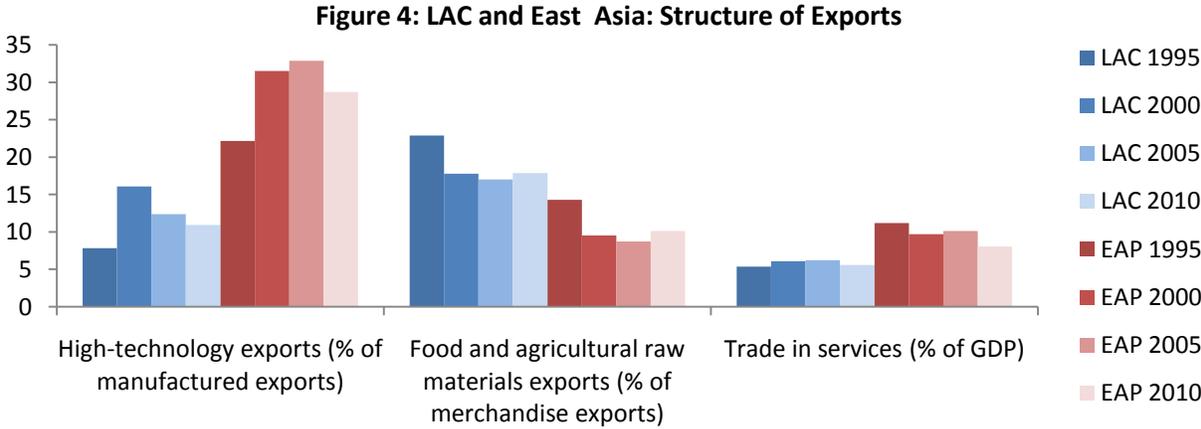
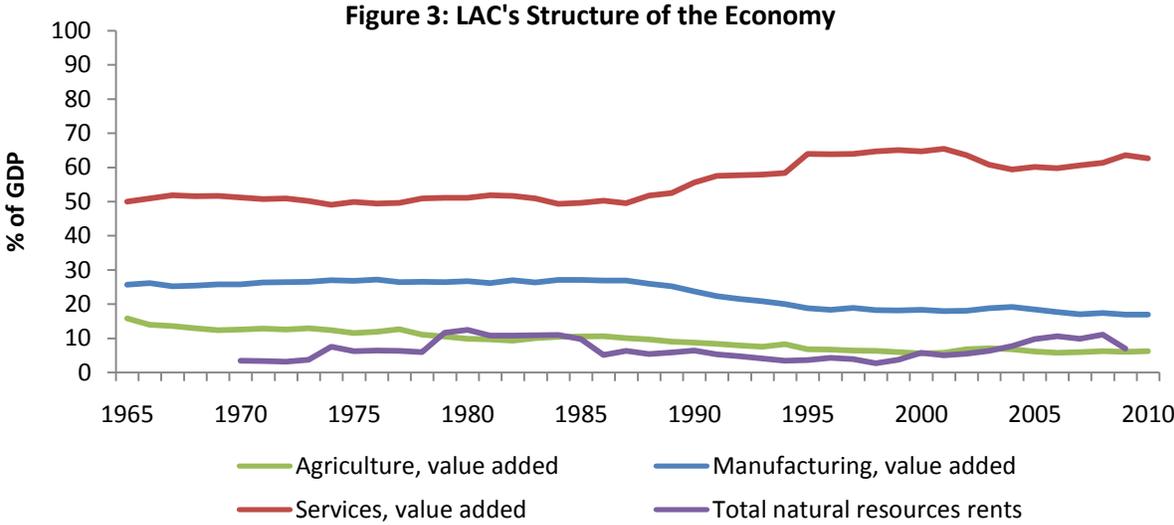
21. Since the financial crisis in many Latin American countries during 1998–2001, Latin America embarked on a new chapter in economic reform, resulting in macro-financial stability, relatively high growth rates and significant steps forward in achieving equitable growth. Driven by high commodity prices and capital inflows, growth rose above that in the G7 and also helped for the first time to reduce poverty and high income inequality. More than 70 million Latin Americans were lifted out of moderate poverty between 2003 and 2012 and at least 12 countries in the region experienced non-trivial declines in their income Gini coefficients (World Bank 2012b). In tandem, the middle classes expanded and, as a result, income inequality fell throughout the region. High growth was significantly driven by the commodities boom.

22. The effectiveness of Latin America's economic reforms since 2000 was evidenced by the resilience of its economies during the recent crisis. The region's recession was relatively short-lived, and with the exception of Mexico, remarkably mild, partly as a result of effective counter-cyclical monetary, fiscal and credit policies made possible as a result of the sustained macroeconomic stabilization since 2000. This macroeconomic stabilization was the result of stronger fiscal management, changes in exchange rate policies and sound financial sectors. Fiscal management improved as a result of the adoption of fiscal responsibility laws that supported consolidation of the budget, the strengthening of monitoring of contingent liabilities and the improvement of debt management. The adoption of more flexible exchange rate policies and inflation targeting also helped macroeconomic stabilization. In addition, stricter banking supervision supported the soundness of the financial system (Singh et al. 2005).⁶ The high commodity prices, boosted by strong demand from large emerging markets during the global crisis, also helped.

23. However, the region's achievements in the area of macroeconomic stabilization and higher growth since the beginning of the decade are attenuated by the fact that Latin America's economies are increasingly dominated by natural resources in South America, while the

⁶ Prior to 2000, inflexible exchange rate regimes had often led to large capital inflows that reduced fiscal discipline, allowed unsound financing of deficits and fueled lending booms that ultimately led to banking crises.

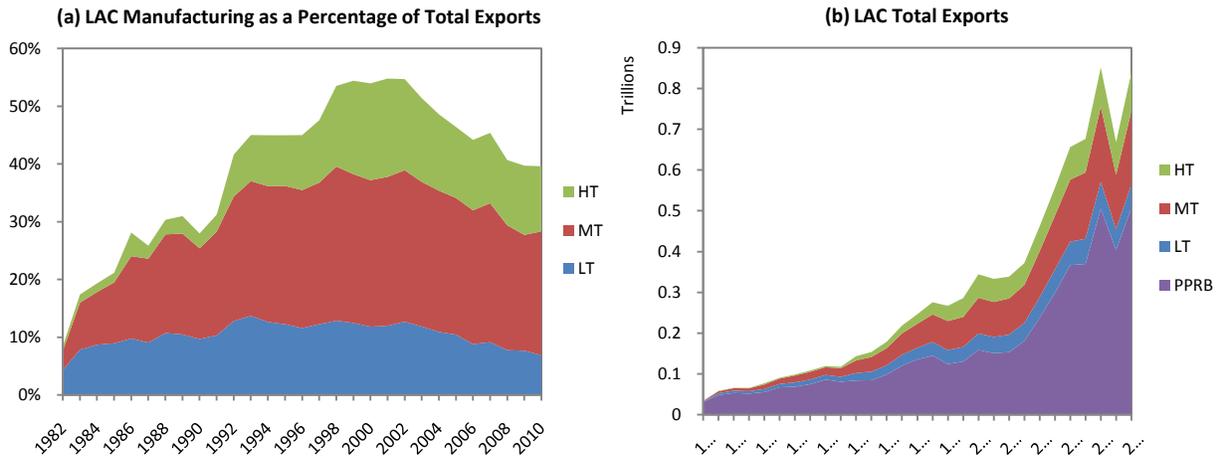
manufacturing sector continues to be dominated by low value-added industries, in particular in Central America (such as the maquilas in Mexico) (Figure 3). In fact, while the Washington consensus policies led to the demise of old and unsustainable industries, new ones did not emerge to a sufficient extent.⁷ The absence of development of new industries also undermined export performance (Figure 4). The lack of LAC's structural transformation is illustrated in figures 3 and 4 which show the evolution of East Asia's versus LAC's economy. East Asia has been increasing the share of high-tech and manufacturing commodities in its exports and in its economy. Latin America to the contrary has experienced a declining share of high-tech and manufacturing exports. Without diversification and structural upgrading, Latin America is less likely to sustain growth and is more exposed to downside risks in the global economy.



⁷ Some new industries have emerged, for example in Peru in the areas of agro-processing or pharmaceutical products.

24. The extent to which Latin America is experiencing deindustrialization can be illustrated by the rapidly declining share of manufacturing in GDP in these countries (Figure 5). Figure 6 gives an indication on the causes of this development showing that labor productivity in manufacturing has been increasing rapidly in China, but has not yet recovered to earlier peaks in Brazil and Mexico.

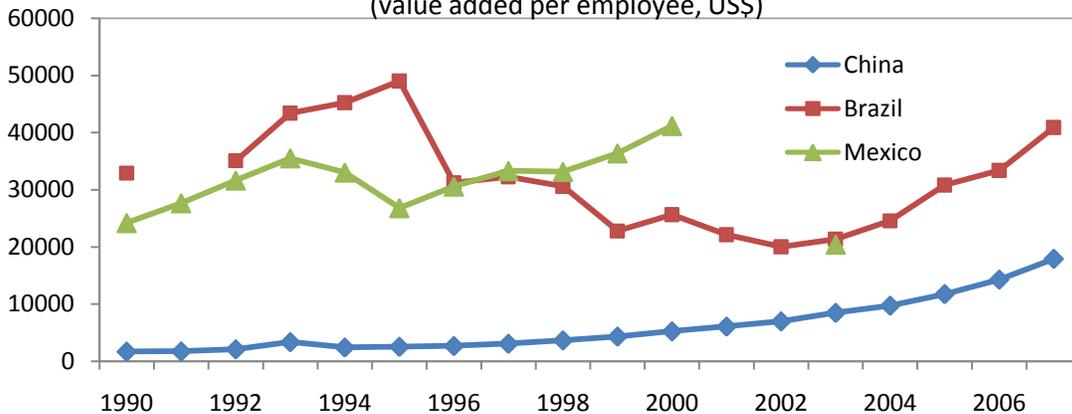
Figure 5: Manufacturing exports of Latin America and the Caribbean by technology level⁸



Note: Technology classification from Lall (2000). HT = High tech (electronics, scientific equipment, aircraft); MT = Medium tech (automobiles, processed chemicals and metals, and machinery); LT = Low tech (textiles, basic metal manufactures); PPRB = Primary products and resource based goods.

Source: Authors' calculation and WITS Comtrade SITC Revision 2.

Figure 6: Labor productivity in manufacturing
(value added per employee, US\$)

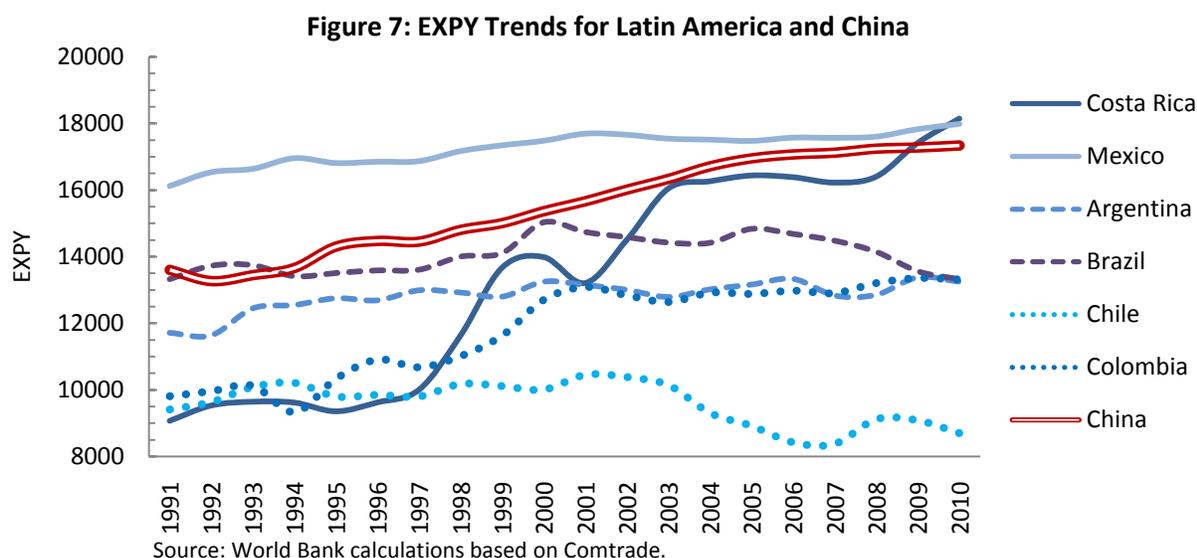


Source: UNIDO (2011).

⁸ The evolution of the share of manufacturing exports may be affected by the substantive increase in commodity prices over the past decade.

25. Differences in the economic performance of East Asia and Latin America can also be illustrated using EXPY and PRODY indicators.⁹ EXPY is a measure of the export sophistication of the product basket for each country. Technically speaking, it is the sum of the country's export share of each product weighted by the PRODY measurement for that product. The PRODY index is the sum of weighted per capita GDPs of all nations for each product, with the weight being the country's export share for the product divided by the aggregate of all nations' export share for the product.¹⁰

26. Figure 7 shows that China has been steadily upgrading their export basket during the past twenty years. The EXPY of Mexico, the highest in Latin America until 2010, slowly increased during the 1990s but stagnated in the past decade. Costa Rica, thanks to the establishment of the Intel semiconductor assembly and test plant in 1996 (Box 1), has leap-frogged all of Latin America to become the nation with the highest EXPY in the region. Colombia has also upgraded its export basket, achieving the same increase in EXPY as China and India but in less time. Argentina and Brazil's EXPY's, however, have stagnated during this period. On the bottom of the spectrum is Chile, whose EXPY has actually declined in the past decade, despite strong economic growth, owing to excessive reliance on copper and other commodities.



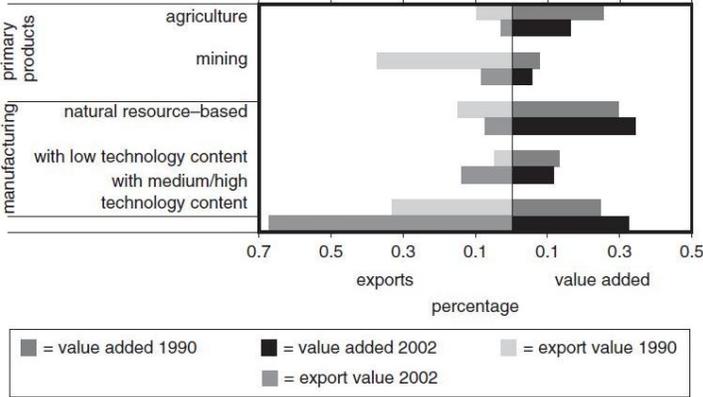
27. Also, in Mexico and Central America the value of medium and high tech exports as a percentage of total export value is considerably higher than their value added as a percentage of

⁹ The PRODY index is a weighted average of the per capita GDPs of countries exporting a given product, and thus represents the income level associated with that product. The index represents a weighted average of per-capita GDPs. EXPY is a weighted average of the PRODY for that country, where the weights are simply the value shares of the products in the country's total exports.

¹⁰ The intuition behind the PRODY index is that it would show which products are more 'sophisticated,' i.e. which products tend to be exported by higher-income countries. It is clear then that the EXPY metric would be highly coordinated with high-income countries. But there are outliers such as China and India, whose EXPY measurement is much higher than their GDP per capita measurements should indicate.

total export value added (Figure 8).¹¹ This reflects the reality that exports of many high and medium-tech products are the end result of processing imported parts and components where the main value added is cheap labor. Manufactures export processing has accounted for 50–60 percent and 70–80 percent of exports for Central America and the Dominican Republic and for Mexico, respectively. While export processing has been an initial platform for progressively adding value in many East Asian countries, that phenomenon has been slower to develop in Latin America.

Figure 8: Mexico: Participation in Exports and Value Added, by Type of Export, 1990-2002



Source: ECLAC (2008).

¹¹ Devlin and Moguillansky (2011).

Box 1: INTEL—Moving up the value chain in Costa Rica¹²

Since Intel's decision to invest in Costa Rica in 1996, the case of the global electronics giant choosing the tiny country to locate its \$300 million semiconductor assembly and test plant has been widely recounted in the field of investment promotion. Not only has Intel Costa Rica had direct impact on the country's economy in terms of GDP, FDI, and trade growth, but Intel's investment decision also served to elevate Costa Rica's global competitiveness as an investment location. This was accomplished with the active involvement of the highest levels of the Costa Rican government. Former Costa Rican President José Figueres took a personal interest in relations with Intel, appointing the Minister of Foreign Trade to head the engagement, which was a critical element of Costa Rica's eventual success. Committed to responding to Intel concerns, the Costa Rican government was ultimately successful in three main areas: (1) taking advantage of country factors (e.g. political and social stability, economic openness and liberalization, focused development of the electronics sector, and having a receptive investment environment); (2) employing negotiation tactics (e.g. unified government response and message, extensive personal involvement from the very top of government, speed in resolving problems, and refusal to engage in "extraordinary" measures); and (3) providing specific concessions to entice Intel (e.g. financial incentives such as full exemption from taxes, infrastructure improvements to the national airport, roads, and energy grid, enhancement in technical school curricula in line with Intel's personnel requirements). A fast-track permitting process was also designed for Intel, which segued into more comprehensive national legislation simplifying the procedures for establishing a business. Over time, INTEL's foreign direct investment has resulted in an improved investment climate, a more focused, strategic approach to investment promotion, a developing technology cluster, and new FDI projects in other targeted sectors.

Intel's initial \$300 million "greenfield" investment in Costa Rica established the 52-hectare campus for the testing and assembly of Intel's products. By 2005, when Intel invested an additional \$260 million to construct a third facility, the Costa Rica campus reflected an accumulated investment of \$770 million, employed 2,900 workers, and generated an additional 2,000 indirect jobs. The INTEL investment had considerable impact on Costa Rica's economy:

Foreign Direct Investment. Intel investment inflows started in 1997 and skyrocketed in 1998 and 1999, during which time Costa Rica received more than \$600 million in new FDI, an increase of about 50 percent over the average in 1996-1997.

Trade. Intel started exporting at volumes previously unknown in Costa Rica. For example, during 1999, Intel exported about \$2.4 billion in products, amounting to 36 percent of the country's total exports. Intel rapidly became the top exporting company, its chips became the top export, and electronic components became the top export category, leaving agricultural and agro-industrial products and apparel far behind.

Value-added. Intel's value-added has been estimated in the range of \$90-\$500 million per year, based on three different calculations: (1) as a percentage of the value of Intel's total exports; (2) as the difference between the value of Intel's exports and imports; and (3) as the amount Intel pays employees and local suppliers.

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Direct employment. Intel jobs are 50 percent better paid than traditional apparel or agro-industrial, and offer recent technical graduates a private-sector job option.

Cluster development. Intel's investment has had a "signaling effect," paving the way for other investors to follow the corporation's lead. Electronics is now Costa Rica's largest sector, comprising 55 companies that collectively employ about 12,000 workers and export more than \$1.65 billion in products per year.

¹² Spar (1998) and Multilateral Investment Guarantee Agency (2006).

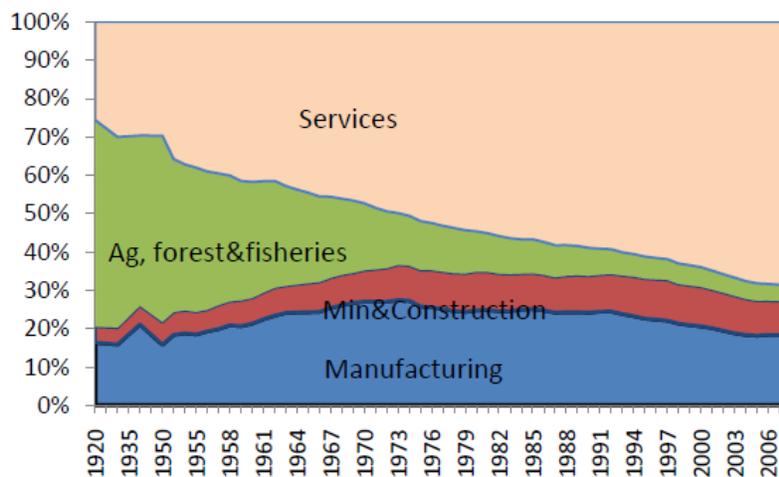
Successful industrial upgrading in East Asia

Japan

28. Latin America's challenge to bring about structural transformation and upgrade its industrial structure to more capital-intensive and skills-intensive manufacturing can be compared to that of East Asia 10 or 20 years ago—when many East Asian countries were on the verge of graduating from labor-intensive to more capital-intensive manufacturing. The NSE contends that the crux of Japan and East Asia's success was that their development followed closely their comparative advantage and that their governments played a facilitating role (Lin 2012, Lin and Monga 2012a, Lin and Monga 2012b). Just before WWII, textiles and other light industrial goods accounted for 60-75 percent of all Japanese exports. Japan's textile industry was at its peak before the Second World War (Ito 1992, p. 24). In the 1960s, when its per capita GDP was about 40 percent of that of the US and it had established a strong industrial base, Japan began to target U.S. industries. Japan's historical labor statistics record that a rising share of labor in Japan's manufacturing sector coincided with a declining share of labor in the US's manufacturing sectors. In the 1960s-1970s, Japan supported its heavy manufacturing sectors, including machinery and automobiles. In the 1980s-1990s, just as the US was upgrading its industrial base, Japan acquired shares in the home appliances, electronics and computer markets (Figures 9–11).

Figure 9: Structural transformation in Japan

Employment in manufacturing increased during 1920–1973, followed by a slow decline as the services sector expanded.



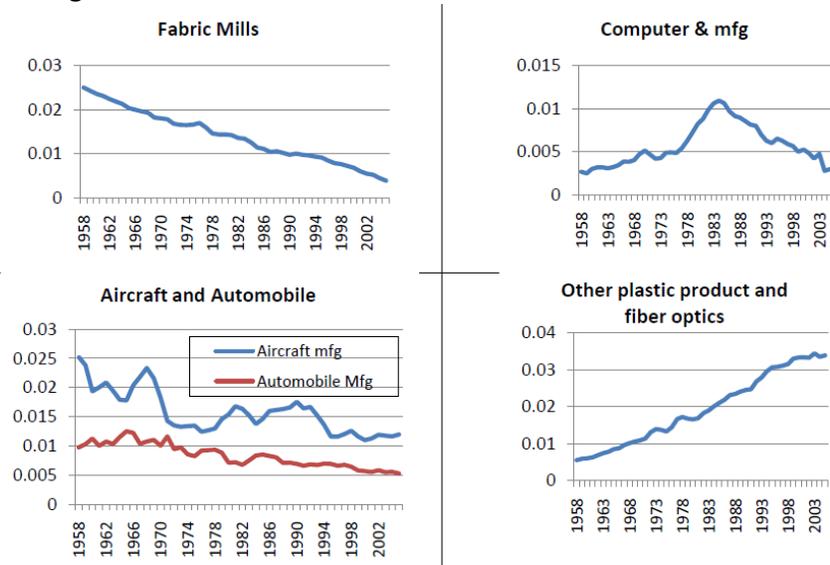
Source: Chandra, Lin, and Wang (2012)

29. The mirror image to these developments in Japan is the evolution of employment shares in the United States during 1958-2005. Figure 10 shows the employment share for five subsectors selected from 99 manufacturing industries, ranked from most labor-intensive to most

capital intensive. Overall, as the capital labor (K/L) ratio increased over time, the industrial and employment structures changed dramatically. Specifically,

- The share of labor employed in the most labor-intensive sectors such as fabrics declined monotonically in the period.
- In sectors such as computer manufacturing whose capital-labor ratio was mid-range, the share of labor employed first increased and then declined, showing a hump or inverse V-shape.
- In industries such as aircraft and automobile manufacturing that are capital-intensive, but subject to labor-saving scale economies, the share of labor showed a slow and declining trend.

Figure 10: The United States as the Leader of transformation¹³

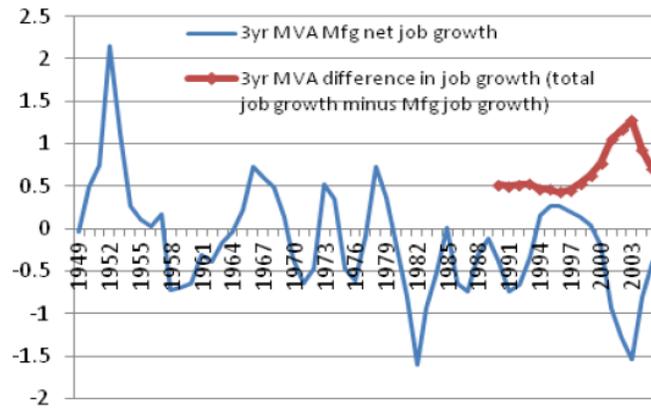


Source: Chandra, Lin and Wang, 2012

30. In the most technology-intensive sectors such as plastics (including fiber optics and lens), the share of employment shows a monotonic increase indicating that the US still maintains a comparative advantage in these industries. In general, however, the manufacturing sectors started to shed labor in the 1970s, and the services sector created more jobs throughout the period. This process accelerated in the 1990s (Figure 11).

¹³ Shares in total employment for selected subsectors ranked by capital-labor ration, 1959-2005 (selected from the 99 industrial sectors)

Figure 11: The United States has been losing manufacturing jobs since the 1970s, and this trend accelerated in the 1990s



Source: Chandra, Lin and Wang, 2012

31. Why is the employment structure in the US changing so rapidly? First, the simultaneous improvements in education, financial, and legal institutions, and in hard infrastructure have allowed firms to constantly innovate and create new industries and exhaust the set of production possibilities (Harrison and Rodriguez-Clare 2010). Second, this process has been accelerated by globalization. Because the US maintained an open trade regime and a liberal investment policy, industrial transformation that started in the 1970s–1980s, is faster in the US than in other countries (McMillan et al. 2011). Third, the behavior of the multinational corporations (MNCs) has played an important role. Using firm level data from the MITI and the US related to outward FDI, Lipsey, Ramstetter, and Blomstrom (2000) found that:

- A Japanese parent's employment, given the level of its production, tends to be *higher*, the greater the production abroad by the firm's foreign affiliates. This is similar to that of Swedish firms, but contrasts with that of U.S. firms.
- U.S. firms appear to reduce employment at home by allocating labor-intensive parts of their production to affiliates in developing countries. Among U.S. firms, production in developing countries is associated with lower parent employment at home, given the level of parent output. This could be interpreted as the U.S. multinationals are footloose, allocating the more labor-intensive parts of their output to developing countries and keeping the more capital-intensive or skill-intensive parts in the home or parent facilities.

32. Why was economic growth in Japan not sustained after the 1970s? From the mid-1950s to 1973, for a variety of reasons, Japan was able to sustain rapid growth for nearly 20 years. Domestic investment accounted for 30-35 percent of Japan's GNP throughout the 1960s. The World Bank (1993) study on "the East Asian Miracle" documents in detail the Japanese government's policy of importing technology for the development of key industries, and the provision of institutional arrangements between the government, banks and businesses. In addition, the government created contests that combined competition with the benefits of cooperation among firms and banks, so individual firms endeavored to choose, adapt, and then perfect imported technologies, including the world renowned "just-in-time" automobile assembly

lines. In our view, Japan's success is mainly attributable to its identification of the right target countries in both pre- and post-war periods, and selection of industries that were consistent with its comparative advantage: textiles in the Meiji period, electronics and heavy manufacturing including automobiles in the 1960–1990s.

33. In 1973, Japan's rapid growth started declining for three reasons: oil crises, decrease in investment, and the slowdown in technological progress. It is reasonable to suggest that "Japan finally caught up with the U.S. and the Western European countries technologically in the mid-1970s. Since it was harder to develop a country's own new technology compared to merely obtaining a license, Japan's growth rate then had to fall" (Ito 1992, p. 72). In other words, Japan's "advantage of backwardness" had been exhausted. The Japanese economy was then constrained mainly by the speed of indigenous innovations on the global technology frontier. Japan had to relocate some of its production base to Korea; Taiwan, China; and other NIEs due to rising labor cost domestically leading to the loss of its comparative advantage in the labor intensive sectors.

34. From 1965 to 1990, Japan emerged as the world's biggest exporter of manufactured goods, increasing its share of the world market from about 8 to almost 12 percent. Japan's success was followed in the 1970s by a second generation of newly industrialized economies (Hong Kong SAR, China; South Korea; Singapore; and Taiwan, China), in the 1980s by a third generation (Indonesia, Malaysia, the Philippines and Thailand (ASEAN4)), and in the 1990s by a fourth generation (China and Vietnam), (Gill and Kharas 2007, p. 81).

35. Japan's experience highlights several important lessons in economic development. First: a country's latent comparative advantage is not static, but changes dynamically as a country upgrades its factor endowment and becomes competitive in industries that are progressively more capital intensive. Second, the importance of learning: in the process of industrial upgrading Japan imitated other, more advanced countries' production technologies and that way improved its human and productive capacities. Learning and capacity-building through imitation and innovation is a key component of growth.

Korea

36. Korea provides an interesting case study of how industrial upgrading took place and how it can be supported through industrial policy.¹⁴

37. Since 1953, Korea's industrial structure changed substantially with the share of manufactures in GDP increasing from 9 percent to 30 percent in 1988, while the share of the agriculture and mining sectors shrank at the same time (Figure 12). In parallel, the dominant share of exports switched from wood manufacture and clothing to machinery and transport equipment (Figure 13).

38. The industrial upgrading of Korea since 1962 is often described as a good example of "Flying Geese catch up" in that Korea imitated countries that were more advanced (the "lead geese" such as Japan) using the "advantage of backwardness".¹⁵ For example, in the textile industry Korea moved from export of clothing to that of textile and to production of synthetic fibers (Lim 2011). In the electronics industry, production started with the assembly of radios from imported components (World Bank 1987), and then moved to electronic parts (i.e. transistor and semiconductor) and information communication & industrial electronics in the mid-1980s and -1990s respectively (Figure 12). Clothing industries had a sharp increase in revealed comparative advantage until the end of the 1960s, followed by footwear until the 1980s and the electronics industry in the 1990s. The competitiveness of the footwear industry benefited from joint ventures and technology cooperation with companies from Korea and Japan. The decline in the footwear industry since the mid-1990s reflects higher wages and led to the relocation of factories to China, Indonesia and Vietnam (Figures 14 and 15). Since the end of the 1980s, outward foreign investment of Korea's labor-intensive industries has increased and its main destination has been Asian countries (Figure 16).

39. Korea's process of industrial upgrading reflected the country's shifting factor endowment structure: The success of labor-intensive industries led to capital accumulation and an increase in the capital intensity of industries (Lin and Chang 2009). Like Japan, learning and capacity-building played a very significant role in Korea's growth process. Notably, when Korea decided to promote ship-building it imported large numbers of foreign workers who had relevant skills and were able to pass on those skills to the indigenous population, thus creating the type of vocational training necessary for the future growth of the industry.

¹⁴ Chandra, Lin, and Wang (2012).

¹⁵ Korea's industrial upgrading process between the 1960s and the 1980s can be roughly divided into 3 phases: i) the "takeoff" phase (1962–1973) ii) the Heavy and Chemical Industry (HCI) drive phase (1973–1979) and iii) the liberalization phase (After 1980) (World Bank, 1987). For the details of Korea's industry policies, see World Bank (1987), Krueger (1997), Suh (2007) and Lim (2011).

Figure 12: Structure of Korea's GDP

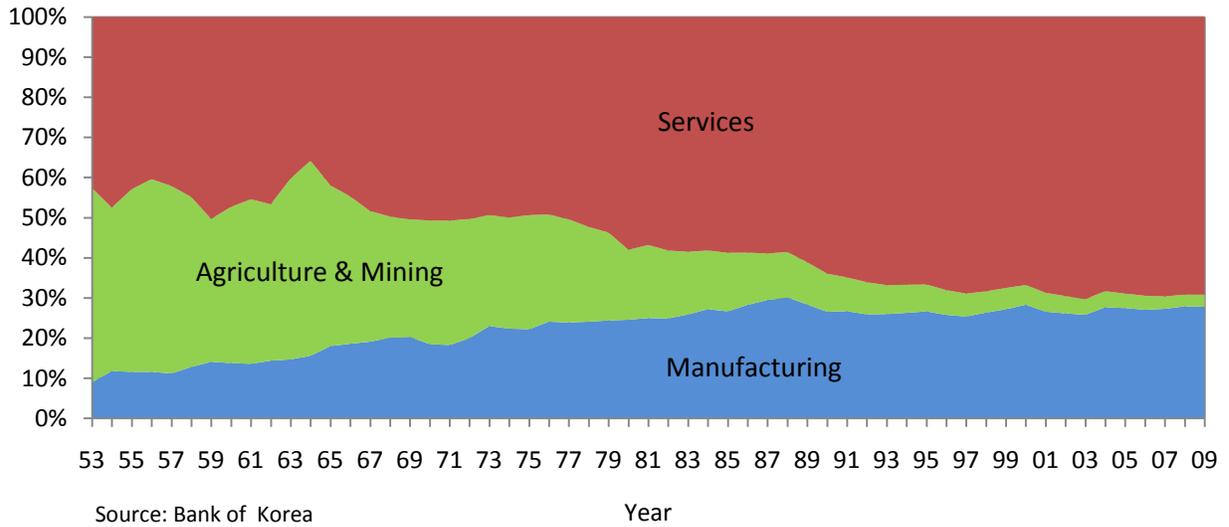
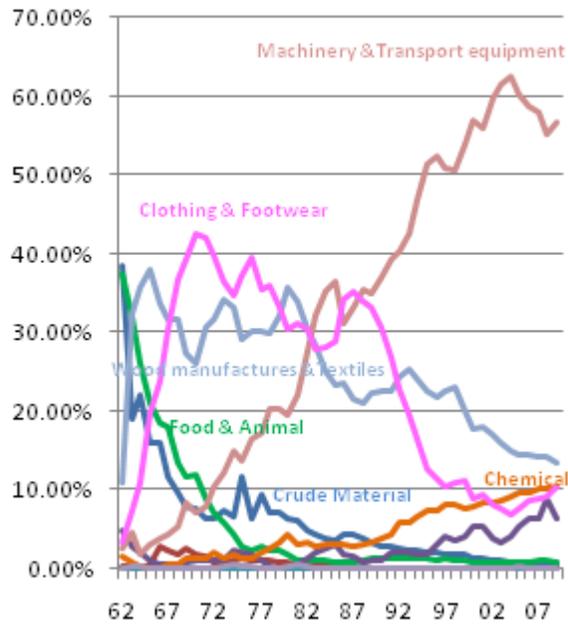
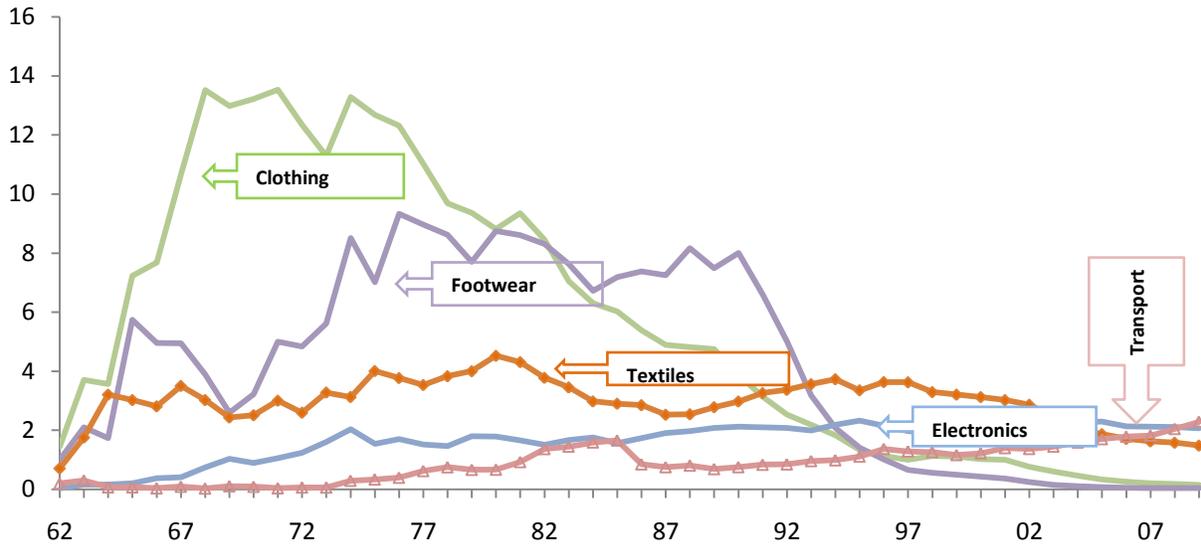


Figure 13: Structure of Korea's exports



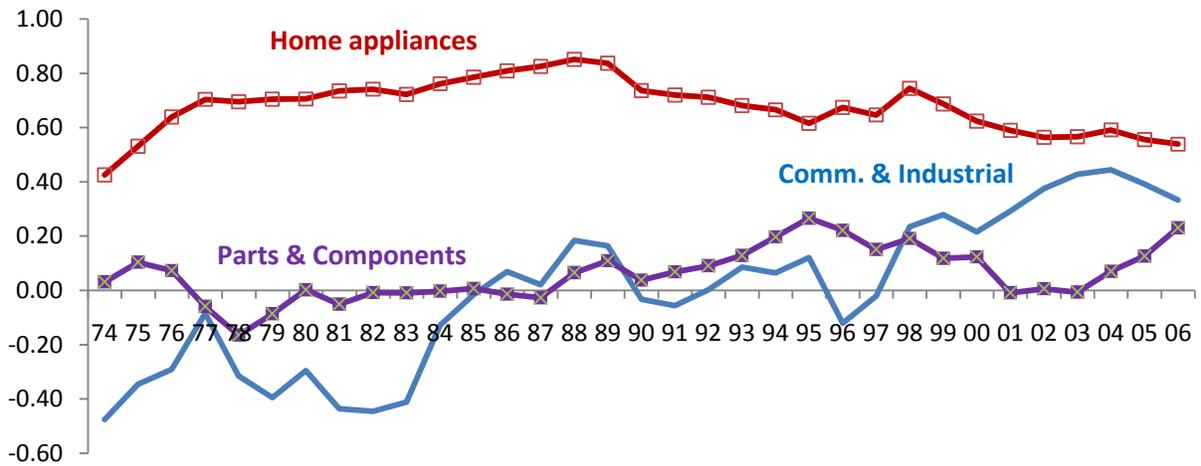
Source: COMTRADE SITC Revision 1.

Figure 14: Revealed Comparative Advantage of Korean Industry



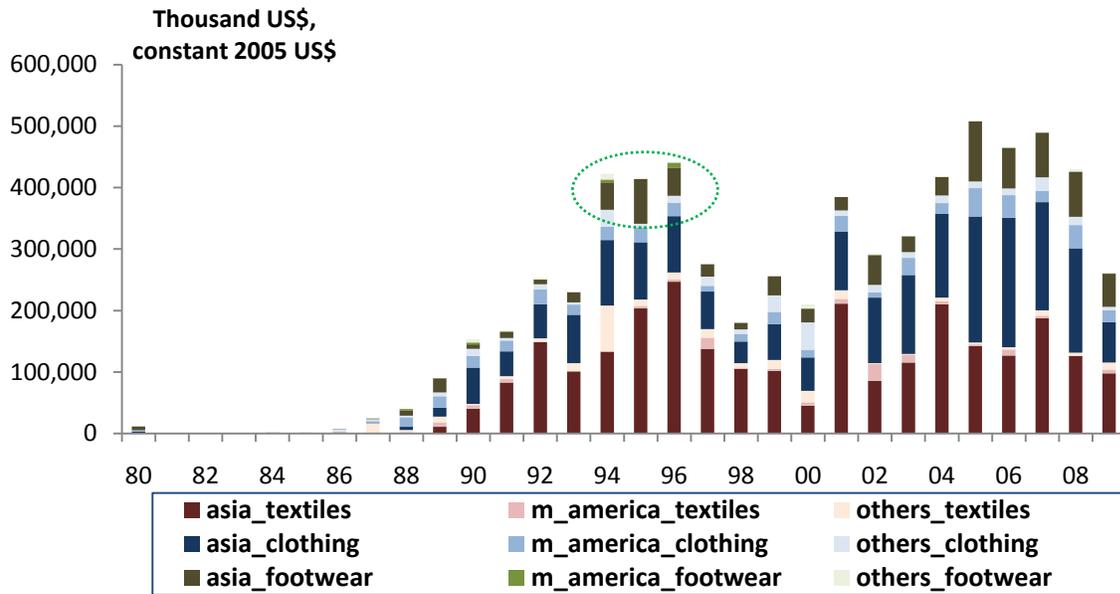
Note: RCA = (The share of an industry in the economy's exports) / (its share in global exports).
Source: Comtrade.

Figure 15: Trade Specialization Index of Korean Electronics



Note: TSI = (Export - Import) / (Export + Import) for each industry.
Source: Korea Electronic Association.

Figure 16: Outward foreign investment of Korea's textiles, clothing and footwear industries



Note: Data for 1980 is a cumulative figure from 1968 to 1980. Data is recalculated on the basis of constant 2005 US\$.
Source: Korea Eximbank

III. The Opportunities and Challenges of China's Rise

40. Industrial upgrading to higher value-added commodities is particularly important in view of the opportunities and challenges to Latin America's economies due to the rise of China. The first decade of the twenty-first century will be considered a strategic inflection point in the global economic landscape. For the first time in almost two hundred years emerging economies will catch up with and race ahead of the developed ones, in terms of gross domestic product—a trend that has received added impetus from the financial crisis. China's meteoric rise is the hallmark of this transformation.¹⁶

41. Over the next few decades, the world will be subject to very significant demographic changes. While Latin America will grow robustly in terms of population, it will be outpaced by other countries in the developing world. Between the years 2010 and 2030, the population of Latin America is expected to increase by approximately 100 million people, but over the same period the population of India is expected to increase by almost three times that amount. China's population growth is expected to decelerate and China's population is likely to plateau around 2030. Table 1 illustrates the population forecasts for these regions.

¹⁶ Gupta and Wang (2009).

Table 1: Population Projections for Latin America and China

Year	Levels (millions)			Percentage of World	
	World	Latin America	China	Latin America	China
2000	6,123	521	1,269	8.52%	20.73%
2005	6,507	557	1,308	8.56%	20.10%
2010	6,896	590	1,341	8.56%	19.45%
2015	7,284	622	1,370	8.54%	18.80%
2020	7,657	652	1,388	8.52%	18.13%
2025	8,003	679	1,395	8.48%	17.43%
2030	8,321	702	1,393	8.43%	16.74%
2035	8,612	720	1,382	8.36%	16.04%

Source: United Nations World Population Prospects (2010).

42. In parallel to these demographic changes there will be major changes in the structure of the world economy. In the post-war era, the United States, Western Europe, and Japan had been the principle sources for global demand. The United States—a nation with 4.5 percent of the world’s population—was accountable for a disproportionate 28 percent of the world’s production in 2010 and an even more disproportionate 33 percent of household consumption. Japan and Western Europe also consumed shares of production disproportionate to their population size. These consumption and production trends became even more pronounced in the years immediately preceding the global financial crisis. Altogether these three regions accounted for 67 percent of global consumption in 2010, while accounting for only 14 percent of the world population.¹⁷ But with the ascent of China as an economic powerhouse the distribution of consumption will be markedly different.

43. What lies in store for future growth prospects in China? One way to gauge the potential is to compare the position of China to that of other emerging economies that caught up rapidly with advanced countries since the end of World War II, in particular South Korea, Taiwan, China and Japan. These economies used their advantage of backwardness¹⁸ to upgrade their technology and industries at a cost advantage, thus achieving a fast rate of structural change and economic growth.

44. In 1979, China had a per capita income that was 6 percent of the per capita income of the United States, when measured in terms of purchasing power parity. In 2008, the per capita income of China was 21 percent of the United States. The current relative status of China to the United States is similar to that of Japan to the United States in 1951, South Korea to the United States in 1977, and Taiwan, China to the United States in 1975. The annual growth rate of GDP averaged 9.2 percent in Japan between the years 1951 and 1971, 7.6 percent in South Korea between the years 1977 and 1997, and 8.3 percent in Taiwan, China between the years 1975 and 1995, and their per capita income increased to 65.6 percent, 50 percent and 54.2 percent of the

¹⁷ World Bank (2011b).

¹⁸ The “advantage of backwardness” refers to the fact that countries can benefit from the technological/industrial gap with the advanced countries by adopting and adapting a new technology or entering in an industry that is new to its economy, but mature in the advanced countries to engineer a sequential structural transformation from labor-intensive industries (i.e. wood manufactures and clothing) to capital-intensive industries (i.e. machinery and transport equipment).

United States' respectively after 20 years' dynamic growth. Since 1979, China has been following a similar development strategy focused on exports and diversification as Japan, Korea and Taiwan, China earlier. In light of these economies' success in narrowing the gap of their economies with more advanced countries through industrial upgrading and the continued large technological gap between China and the United States, it would appear that China has the potential to achieve 8 percent growth for another 20 years. By that time, the per capita income of China measured in purchasing power parity may reach about 50 percent of the per capita income of the United States, and China's economy could be twice as large as that of the United States.¹⁹

45. The recently released joint World Bank – DRC²⁰ China 2030 report stresses that the growth scenarios for China would depend to a large extent on the reforms that would be adopted by both advanced economies and China. These reforms would have to address structural bottlenecks in these countries as well as growing risks from the global economy, including the tenuous fiscal positions of many European nations and the sluggish recovery in the United States. The China 2030 report presents two growth scenarios for the global economy and for China based on different assumptions about reform.

46. The high growth scenario assumes that key domestic reforms are being implemented in both advanced and developing economies by the year 2030 (Figure 17). In China, these reforms include the removal of various barriers to exit and entry of the private sector and the implementation of corporate reform, especially regarding dividends, for state-owned enterprises which would lead to greater competitiveness and would reduce imbalances on account of high corporate savings. Increased severance taxes on the extraction of energy resources such as coal, petroleum, and natural gas would limit concentration of wealth in these sectors. The banking system, which is largely composed of state-owned enterprises and dominated by four firms²¹, would be gradually commercialized and free to set interest rates according to market forces. This would allow the private sector to be able to borrow at the same rate as state-owned enterprises and credit would also become more easily available to small and medium-size enterprises. The hukou system²² in China would be gradually phased out to allow for greater labor mobility between provinces and to help social security for the rural poor. The adoption and distribution of innovative practices that are fostered by favorable trade and industrial policies would lead to the domestic migration of labor from the low-productivity agricultural sector to higher-productivity manufacturing. These practices would also lead to greater capital accumulation, both physical and human, that will facilitate the development of manufacturing and service sectors.

47. These reforms would allow for higher productivity within the Chinese economy, as well as increased consumption of services by more affluent consumers. Assuming conservative rates of innovation, globalization of both production and consumption of services, and increased economies of scale, growth rates as high as 10 percent for China in the remainder of this decade, and 8 percent and 7 percent respectively for the following two decades would materialize. During 2020 and 2030, lower growth rates are expected due to diminishing returns on

¹⁹ Measured in market exchange rates, China could be at least the same size as the United States.

²⁰ Development Research Center of the State Council of the People's Republic of China.

²¹ These are Bank of China, China Construction Bank, Industrial and Commercial Bank of China, and Agricultural Bank of China.

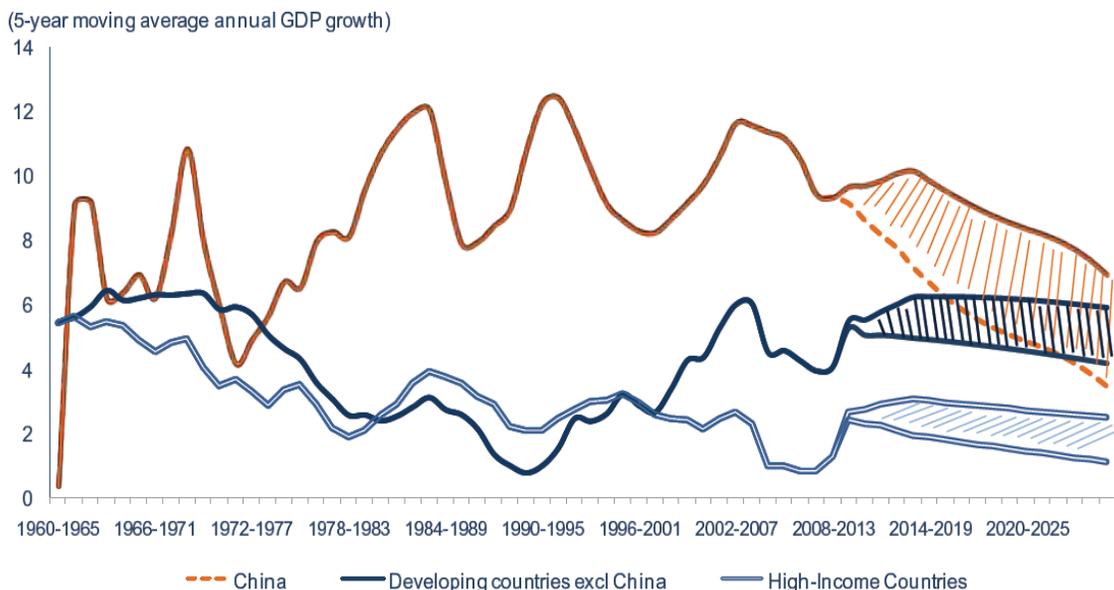
²² A household registration system that restricts the movement of people between rural and urban areas.

productivity in China, India, and other rapidly upgrading developing economies as these nations approach the technological frontier. Advanced economies, if they are able to address their residual fiscal and unemployment problems exacerbated by the global financial crisis, could quite possibly return to the respectable growth rates they enjoyed during the 1990s.

48. The low growth scenario presented by the China 2030 report assumes that necessary reforms would not be properly implemented, meaning that constraints on growth would not be addressed. Aging populations in China, Western Europe, Japan, and Russia would limit economic growth as a result of the decline in the labor force, leading to lower aggregate savings and investment. Yet, increasing needs for human capital in biotechnology and information technology sectors would require higher levels of human capital and increased expenditure on education, further increasing the investment burden of aging economies. Despite this, China is still expected to be one of the most dynamic economies this decade before the increased elderly dependency rate decreases the projected range of its growth projection to 4 to 7 percent.

49. The developing world has been the main driver of global growth since the eruption of the global financial crisis (Figure 18). In both low and high growth scenarios, developing countries will account for a rising share in the global economy. Figure 19 shows that the developing world will contribute over two-thirds of global growth by the year 2030 in the high growth scenario, and roughly three-fifths of global growth in the low-growth scenario. Developing countries other than China will account for a considerable 40 percent of this growth in the high-growth scenario. Driving the growth in both scenarios would be the relatively high technological progress in developing countries, as China, India, and other developing countries take advantage of their backwardness and catch up with advanced countries through structural upgrading. But the biggest growth driver, especially in the high case scenario, would be the degree of technological progress within developing countries.

Figure 17: Growth trends for China and HICs



Source: World Bank.

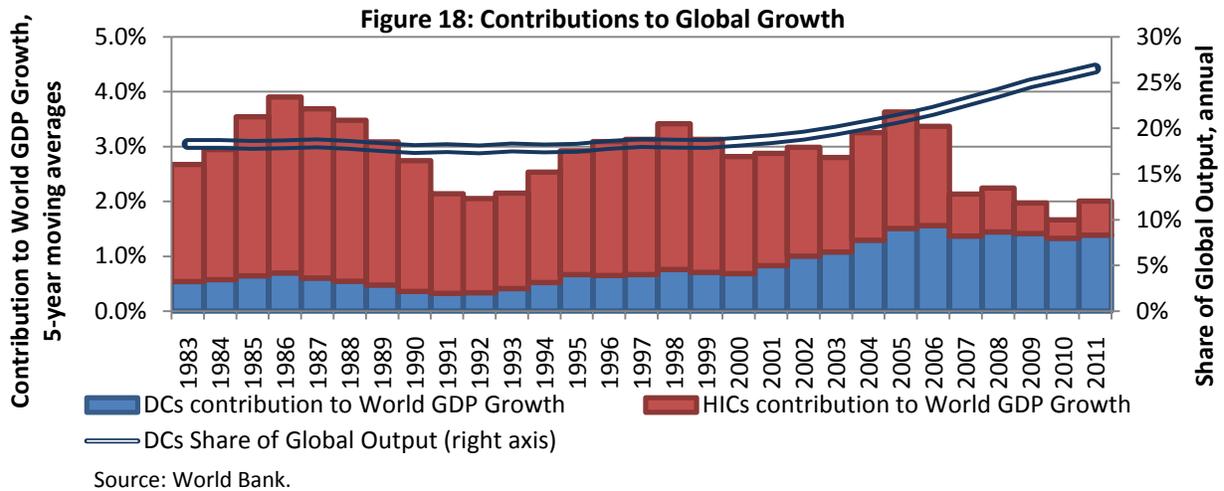
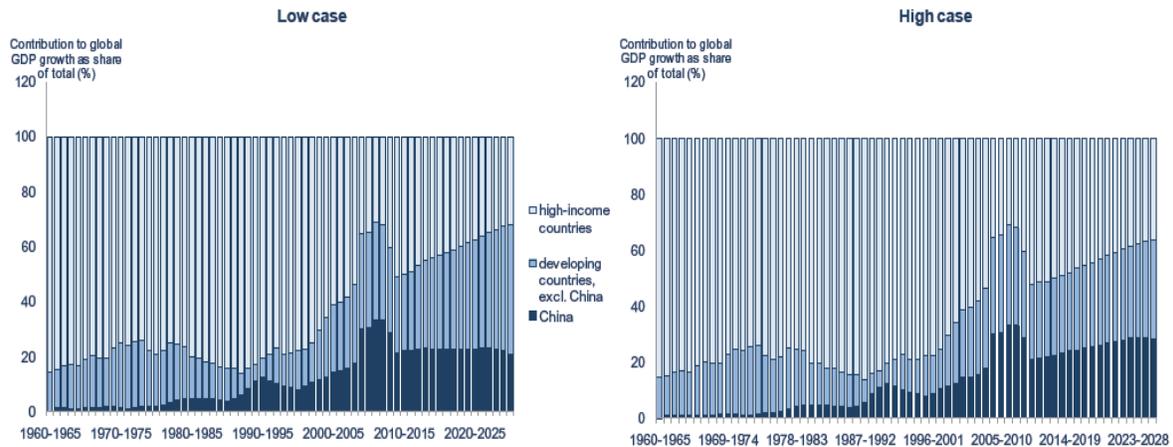


Figure 19: Rising Share of Developing Countries to Global Growth



Note: 5-year moving average used for growth shares.
Source: World Bank calculations.

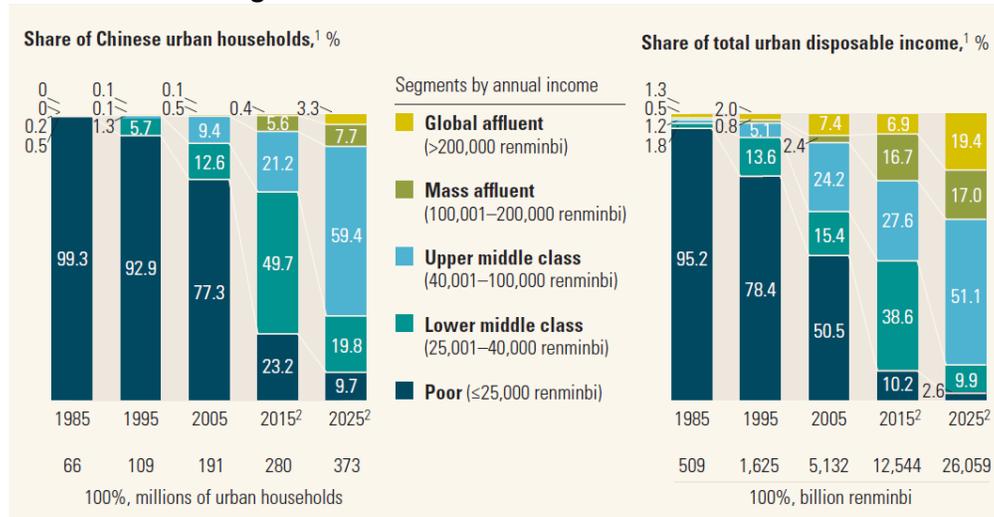
50. The increased growth of developing economies will have considerable impact in both advanced economies and on the developing economies themselves. New markets are being created in China and other developing economies, and these markets are going to be increasingly driven by domestic consumption, South-South trade, and innovation rather than by export-led growth dependent on established markets in the United States, Europe, and Japan. Other regions can take advantage of this paradigmatic shift and capitalize on the new opportunities, while preparing for the economic challenges that will be the result of the structural upgrading that China will pursue. A better understanding of the changing market in China would facilitate this upgrading. A key change will be emergence of a growing middle class.

51. There are various ways of defining the middle class. The definition used for the purpose of this paper has been proposed by Kharas (2010). It states that the lower bound of the middle class is the poverty line in relatively poor advanced countries like Portugal, and the upper bound

is twice the median income in the richest advanced country, Luxembourg. This measure creates an absolute standard of the middle class that ensures that a consumer will not be considered poor in the least wealthy advanced country, but would not be considered wealthy in the wealthiest advanced country.

52. Various estimates indicate that the Chinese middle class is already larger than that of the United States. Conservative estimates state that 350 million new middle class consumers in China will be created in the next 15 years.²³ According to econometric projections calculated by McKinsey in Figure 20 the middle class in China is calculated to grow by a factor of 3.6 from 2005 to 2025, while those in poverty will decline by a factor of 7.9. This means there will be 875 million Chinese people out of poverty by 2030 (United Nations World Population Prospects 2011, McKinsey 2006).

Figure 20: Chinese Urban Income Distribution



¹Some figures do not sum to 100% due to rounding; disposable income = after-tax income, including savings; real renminbi, base year = 2000; 1 renminbi equal \$0.12.

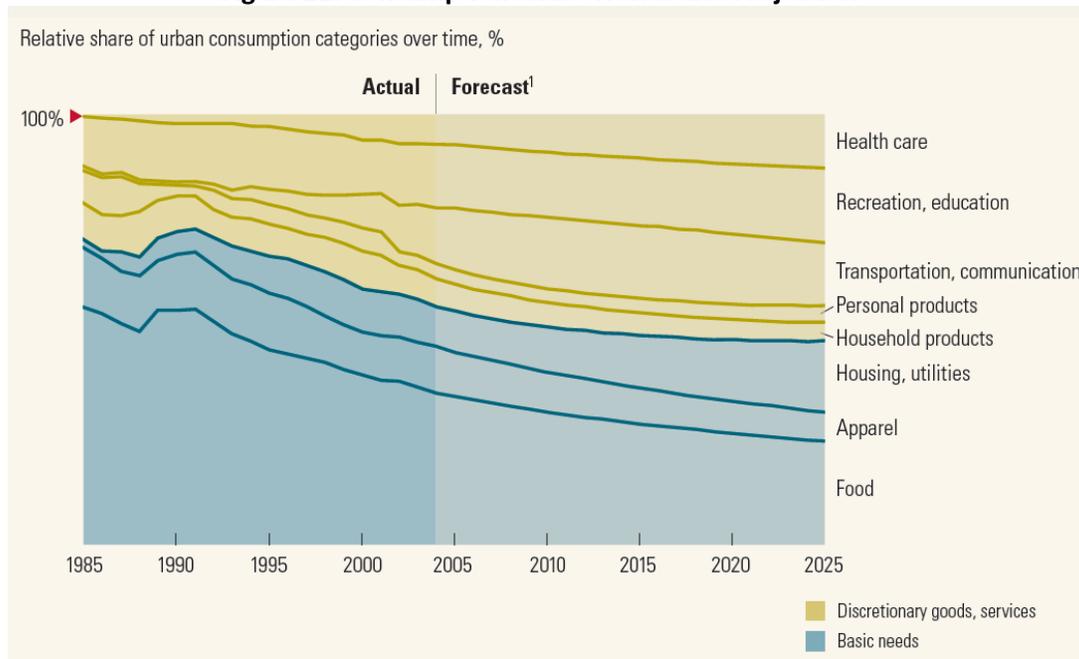
²Base case forecast, Q1 2006.

Source: National Bureau of Statistics of China; McKinsey Global Institute.

53. Based on projections by Kharas (2010), the share of the US middle class in the global middle class may drop from 24 percent in 1965 to 12 percent in 2010 to 4 percent in 2030. At the same time, the share of China's middle class is predicted to be 20 percent by the year 2030, rising from 9 percent in 2010. This figure alone epitomizes the new type of world economy that will exist in the future, and will lay the backdrop for the new opportunities and challenges for Latin America and the Caribbean. The strengthening of China's middle-class will imply a shift towards consumption-driven growth, with the structure of consumption expected to move away from food consumption (which has recently fallen to its lowest levels since the late 1980s) towards transportation, communication, recreation, and healthcare.

²³ Wilson and Dragusanu (2008).

Figure 21: Consumption Share Trends and Projections



¹Base case forecast, Q1 2006.

Source: National Bureau of Statistics of China; McKinsey Global Institute.

54. As a result of these shifts in consumption, China will soon become the largest market for many products and services. The nation will account for at least 16 percent of the world's market for products and services, and most of the growth will come from the creation of large middle class mass markets. A few features illustrate these changes:

- According to CEIC Data, China passed the US in terms of annual sales of cars in 2009, selling 13.6 million vehicles that year and 18.5 million in 2011. In 2002 there were an estimated 20.5 million cars in China, a number which could rise to 390 million in 2030.²⁴
- China was the largest market for the Nokia Corporation as of 2007. At this time, there were an estimated 500 million mobile customers in China, adding 6 million new subscribers every month. Wal-Mart executives noted that China may be the only country that could prove to be a revenue base as large as that in the United States.²⁵

55. Yet, in spite of these changes, China is expected to remain competitive due to its relatively low wages for both unskilled and skilled labor.

- Labor costs, measured as average hourly compensation including benefits for production workers in China projected for 2011 were \$1.96. To put this into perspective, Japan had labor costs of \$22.61, the United States \$25.34, and Germany \$34.46.²⁶

²⁴Dargay, Gately, and Sommer (2007).

²⁵Gupta and Wang (2009).

²⁶Economist Intelligence Unit, Euromonitor, U.S Department of Labor, and Boston Consulting Group.

- Regarding white-collar jobs, in 2012 the total annual compensation (including benefits) for an analyst programmer in China was between \$20,000 and \$36,000, with a research programmer earning between \$47,000 and \$79,000. The cost of engineering talent in China thus remains at around 40 percent of that in the United States.

56. China will foster the development of many multi-national corporations that are likely to be big players in the global market. Collaboration with these local corporations (which are familiar with local tastes and enjoy government support) could also help facilitate the growth of multinational corporations interested in investing in China. Chinese examples include Huawei, Lenovo, Haier Group, and Chery Automobile.

How has Latin America been affected so far by the rise of China?

57. Public opinion in Latin America about China's growth frequently expresses severe fears about the possibly destructive impact that increased competition from China may have on Latin American countries. Calls for protectionism against perceived unfair competition from cheap imports from China abound. Yet, the impact of China's rise on Latin America is complex.²⁷

58. On the one hand, the fast growth of China and its rapid integration into world markets has been taking market share away from LAC exporters in certain sectors. Some industries that appear to be negatively affected include industrial and electrical machinery, electronics, furniture, textiles and transport equipment, mainly in Mexico and to some extent in Central American countries (Tables 2 and 3).

59. On the other hand, the growing demand of China has benefited some exporters. Calderón (2007) found that there has been a significant increase in the correlation between the business cycles in LAC and China, largely explained by the high correlation between Chinese industrial output and world commodity prices.²⁸ This was especially the case with metals and minerals (driven by copper and, since 2004, by iron ore and zinc) as well as beverages (driven by coffee). Sugar prices have also benefited from the growth of China, whereas the price of soybeans and wheat shows a strong and rising correlation with the Chinese production index until late 2004, but has been declining since then. This suggests that the commodity boom currently benefiting LAC is heavily dependent on the continuing growth of the two Asian economies.²⁹

60. The importance of China as a destination for LAC exports increased four-fold since 1990 when they represented less than 1 percent of LAC exports. This signals a significant increase in trade opportunities, even though the levels remain quite low, generally representing less than 10 percent of total imports. The share of China in total LAC imports also increased significantly over the period, signaling that their growing presence may be hurting some firms in LAC, but also benefiting consumers.

²⁷ Lederman et al. (2007a) and Lederman et al. (2007b).

²⁸ Calderon (2007).

²⁹ The cited studies also refer to India. However, we only discuss findings related to China as it is China's demand for natural resources and its growing competitiveness in high-value added manufacturing products that represents the most important challenge to Latin America.

61. Lederman, Olarreaga, and Rubiano (2007) provide sector-level evidence of how China's growing presence in world markets has been affecting LAC's trade specialization. First, they construct an index of Revealed Comparative Advantage (RCA) at the global level that accounts for exports and imports, as well as the relative size of world markets to capture the overall competitiveness of each country by sector (Vollrath 1991).³⁰ They then explore the evolution of the correlation between LAC RCAs on the one hand and Chinese RCAs on the other hand over the past two decades.

62. The results suggest that LAC's trade specialization—with the exception of Mexico—has diverged from the trade specialization of China between 1990 and 2004. By 2004, China and LAC only shared two sectors of comparative advantage (wood production and fishing). China's specialization pattern at the end of the period (early 2000s) was negatively correlated with the specialization pattern of most LAC economies (again, Mexico is an exception). Lederman, Olarreaga, and Rubiano (2007) also found evidence of strong complementarities between LAC's and China's specialization pattern in natural resource-intensive industries and to some extent industries intensive in scientific knowledge.

63. The data also suggest that China experienced large increases in the RCAs of its manufacturing sector and a large decline in commodities (agriculture, fishing, logging, and mining). In LAC, the changes in RCA's have been modest, although there is considerable heterogeneity.³¹ The fact that the specialization pattern of LAC is moving away from the specialization pattern of China may reflect various factors. On the one hand, LAC may be specializing in a few products (concentrating its exports) where China's presence is not very strong or declining. On the other hand, LAC may be diversifying its export bundle into new sectors. The evidence suggests that LAC as a whole has been moving towards higher concentration of its export bundle since the mid-1990s.

64. Lederman et al. (2007) find that over the period 1990-2004, LAC's comparative advantage lied in sectors that are intensive in natural resources, scientific knowledge and unskilled labor, in decreasing order. LAC's specialization in natural-resource- and scientific-knowledge-intensive industries can be attributed in part to the rapid growth in China. But, there is evidence that in some countries, China may be pushing LAC economies toward low-wage, unskilled, labor-intensive sectors (e.g., the apparel sector in Haiti and Nicaragua). In other

³⁰ Vollrath (1991) proposed a measure of RCA that corrects for three problems associated with the traditional Balassa measure of RCA. First, it eliminates any double counting problem by excluding the sector and country trade values in the aggregates that are used as benchmarks to compare a country/sector RCA. Second, it is based on a measure of net exports, which allows the RCA to capture intra-industry trade. Third, the measure proposed by Vollrath (1991) is symmetric, with positive values indicating revealed comparative advantage and negative values a revealed comparative disadvantage. The symmetry of the RCA index is an important feature for econometric analysis. The Vollrath (1991) index, however, is imperfect for international comparisons over time since the average value will depend on the degree of concentration of exports and imports in each country/year. In order to make inferences regarding whether a country's comparative advantage has increased over time, all values are normalized by their country/year mean.

³¹ For example, Mexico and to a lesser extent Andean and Central American countries have a similar pattern of specialization as the one observed in China and India, although not as pronounced. The Southern Cone, in contrast, experienced increases in their comparative advantage for commodities, while their comparative advantage in manufacturing declined.

countries and sectors, however, firms are adjusting by moving toward higher quality and skills-intensive products (e.g., apparel in Costa Rica and Dominican Republic) as competition from China intensifies. Using an index of potential industry wages—measured by the export weighted sum of GDP per capita—Freund and Ozden (2006) also observe that LAC is moving toward higher-wage products, though at a rather slow rate, especially when compared with China.

65. Overall, Latin America has both benefited from and been adversely affected by China's rise. While there is some evidence that Latin America has moved to higher value-added goods, it has also lost competitiveness in a number of labor-intensive manufacturing sectors raising the specter of de-industrialization and heightened exposure to fluctuations of the world economy.

Table 2: Exports to the World, Percentage Threatened by China

	<i>Direct</i>	<i>Partial</i>	<i>Total</i>
Argentina			
As % of manufacturing exports in 2006	37	59	96
As % of all exports in 2006	10	16	27
Brazil			
As % of manufacturing exports in 2006	20	70	91
As % of all exports in 2006	9	30	39
Chile			
As % of manufacturing exports in 2006	29	53	82
As % of all exports in 2006	2	4	5
Colombia			
As % of manufacturing exports in 2006	15	66	81
As % of all exports in 2006	5	20	25
Costa Rica			
As % of manufacturing exports in 2006	36	60	96
As % of all exports in 2006	22	36	58
Mexico			
As % of manufacturing exports in 2006	70	28	99
As % of all exports in 2006	52	21	72
LAC			
As % of manufacturing exports in 2006	62	31	94
As % of all exports in 2006	27	14	40

Source: Gallagher and Porzecanski (2010).

Table 3: Percent of 2006 High-Tech and Total Exports Under Threat from China (2000–2006)

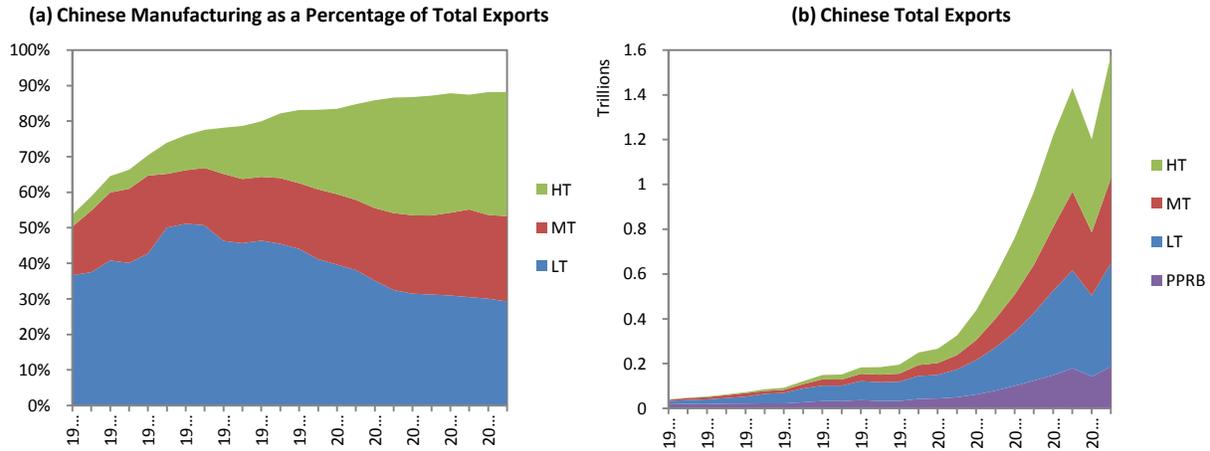
	<i>Direct</i>	<i>Partial</i>	<i>Total</i>
Argentina			
As % of HT exports in 2006	49.45	6.69	56.14
As % of all exports in 2006	1.21	0.16	1.37
Brazil			
As % of HT exports in 2006	41.24	52.42	93.66
As % of all exports in 2006	3.16	4.02	7.18
Chile			
As % of HT exports in 2006	0.13	0.07	0.2
As % of all exports in 2006	0.05	0.03	0.08
Colombia			
As % of HT exports in 2006	10.9	38.53	49.43
As % of all exports in 2006	0.26	0.92	1.18
Costa Rica			
As % of HT exports in 2006	31.57	61.53	93.1
As % of all exports in 2006	9.96	19.42	29.38
Mexico			
As % of HT exports in 2006	65.1	16.55	81.65
As % of all exports in 2006	32.3	8.21	40.51
LAC			
As % of HT exports in 2006	68.7	26.66	95.36
As % of all exports in 2006	8.28	3.21	11.49

Source: Gallagher and Porzecanski (2010).

66. While the share of exports of manufactured goods increased since 1982, since 2001 it started to decline and has now fallen to levels last seen in the early 1990s (Figure 5). The decline in the share of manufactured goods for Latin America after 2001 can be attributed not only to a stagnating or falling share of manufactured exports, but also to the rapid growth in the exports of primary products and resource based goods since 2004. Latin America's increasing integration with the world economy has been driven by its exports of commodities and basic goods, while its export of manufactured goods has only grown slightly. The limited structural upgrading that Latin America witnessed in the early 1990s has slowed to a standstill.

67. The evolution of exports from Latin America can be contrasted with those in China. As panel (a) of Figure 22 indicates, the composition of Chinese exports has been increasingly dependent on manufacturing. Its 1987 share of manufacturing exports was approximately equal to the 2001 peak for Latin America and the Caribbean. Since then its share of manufacturing exports has grown steadily, mostly driven by increases in high technology exports such as computers and telecommunication equipment. Occurring simultaneously was the reduction of the share of low-technology exports due to structural upgrading to higher value goods. Chinese exports from all technological groups rose dramatically after its accession to the World Trade Organization in November 2001, as seen in panel (b). Labor-intensive low technology manufacturing has fallen behind high technology exports, providing further evidence that China is in the midst of structural upgrading towards higher value products.

Figure 22: Manufacturing exports of China by technology level

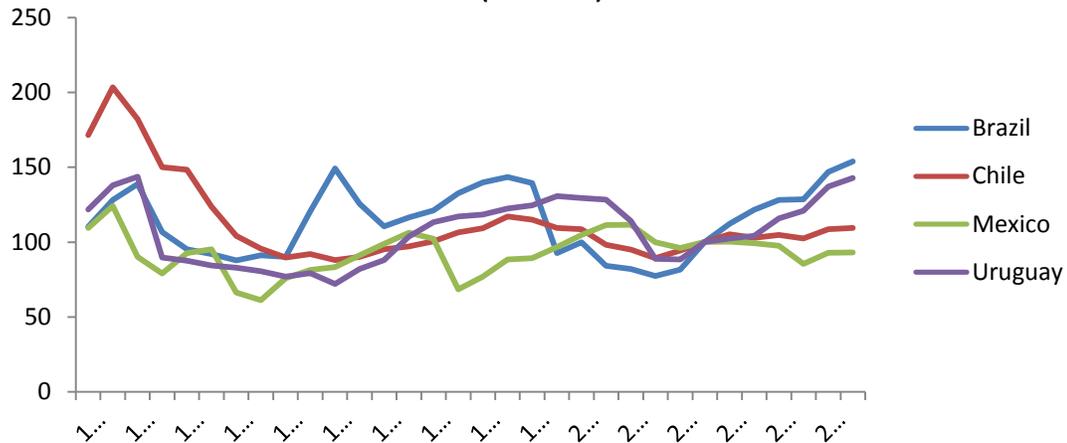


68. The risk is that, if LAC countries cannot achieve dynamic industrial diversification and upgrading, their economies could further regress and increase their dependency on natural resources, thus remaining trapped in middle-income status, causing unemployment and other social and political issues.

69. This structural transformation has become even more imperative because of the growing competition from China to traditional manufacturing products from the region, discussed above. As a result, the traditional export base of the economy is declining (Figures 3–5). Yet, diversification towards higher value-added exports is increasingly hampered by an excessive appreciation of the exchange rate—also called Dutch disease—resulting from large capital flows associated with the natural resources exports as well as low domestic savings rates (Figure 23).

70. While the resource boom may be maintained, the effect may diminish given the expected decline of resource intensity of China's future growth. China will continue to be the largest consumer of commodities in the developing world, importing more primary resources than the rest of the developing world through the 2020s (Garnaut 2012). But projections indicate that the share of industrial production in China's economy will decline from 43.8 percent in 2011 to 34.6 percent in 2030. With less industry, especially heavily polluting and dirty industry, China will be less reliant on primary commodities (World Bank and DRC 2012). LAC countries will still have opportunities to utilize the rents from commodity exports to facilitate structural upgrading, but the growth of these rents will decline.

**Figure 23: Real Effective Exchange Rate
(2005=100)**



Source: IMF International Financial Statistics.

71. Several trends of the current global economic environment further heighten the need and urgency for structural transformation:

- As a result of tailwinds of buoyant capital inflows and high commodity prices, domestic demand has started to hit capacity constraints in the high-growth economies in LAC and the region is showing signs of overheating.
- The crisis in the Euro-zone and the weak recovery in the United States create considerable risks given that these are the most important export markets for the region. Obviously, to the extent that the risk of a catastrophic meltdown materializes, growth prospects will be substantially and adversely affected.
- The decoupling of cyclical GDP growth between emerging and advanced economies since 2009 may not continue. If world economic growth falls significantly, it is conceivable that growth in LAC will fall sharply.³²

72. Against this background, the region faces additional pressures to further develop its competitiveness with other regions, particularly those in other Southern markets, such as China and other East Asian markets, and diversify its economies.

73. The next sections will discuss the historical evolution of Latin America and elaborate a framework that will help to develop a possible response for Latin America to facilitate the structural transformation needed to allow the region to achieve sustainable high growth through diversification and meet the challenges arising from the new world economy.

³² World Bank (2012c).

Latin America—Where is it coming from?

74. Latin America's economic history since the beginning of the 20th century can be broadly divided into two periods: first, the period of state-led industrialization strategies through the late 1980s, and second, the pursuit of policies under the Washington consensus since then.

75. Since the early post-World War II period (and even before the war), governments in Latin America actively intervened in the economy.³³ That intervention involved a top-down, government-dominated approach aimed at achieving inward-looking import substitution industrialization with public enterprises playing a major role. As in other developing countries, the objective was self-reliance from industrialized countries and a quantum leap to the level of development of more advanced countries. The common denominator of these strategies, especially after WWII, was that the government targeted industries that were successfully flourishing in countries whose per capita income was far higher than its own. The focus of these strategies on the fact that market failures may result in a structural gap to the advanced countries was appropriate. However, due to the lack of comparative advantage, the region was unable to compete in these industries.³⁴

76. Moreover, to implement this comparative-advantage defying strategy, Latin American governments had to protect numerous non-viable enterprises in the priority sectors. The measures to which governments resorted to reduce the investment and operational costs of non-viable enterprises included granting those enterprises a market monopoly, suppressing interest rates, overvaluing domestic currency, controlling prices for raw materials, and imposing high tariffs on imports. Such interventions caused widespread shortages in funds, foreign exchange, and raw materials. Consequently, governments also had to allocate resources directly to those enterprises through administrative channels. For ease of implementation and reducing the incentives for rent-seeking, many countries relied on state-owned enterprises to develop the targeted industries.

77. But these state-owned enterprises needed to be protected by various policies, such as subsidies and high tariff barriers. These protectionist measures led to various types of costs. As the prices of imports and of import-substituting goods increased relative to the world price, this pushed the economies to consume the wrong mix of goods from the point of view of economic efficiency. Markets fragmented as the economies produced goods at too small a scale, again resulting in loss of efficiency. Protectionism also lessened competition from foreign firms and encouraged monopoly power among domestic firms whose owners were politically well-connected. Moreover, it created opportunities for rent-seeking and corruption, which raised input and transaction costs. In addition, state-owned development banks and other financial institutions which played a crucial role in promoting this development strategy were affected by non-performing loans, partly because the enterprises that were supported by government interventions were not sustainable.

³³ Devlin and Moguillansky (2011).

³⁴ Lin (2009).

78. Policies aimed at supporting these strategic industries also had high fiscal costs and led to burgeoning budget deficits: for one, subsidies and direct transfers to inefficient public enterprises and non-viable financial institutions led to rising expenditure. At the same time, government revenue crumbled as a result of anemic growth and inefficient tax collection mechanisms. Rising budget deficits were financed both through seigniorage and domestic and external debt, leading to high inflation, macroeconomic instability and unsustainably high debt. The situation came to a head in the debt crisis of the 1980s which highlighted the unsustainability of the old structuralist paradigm (Figures 24 and 25).

79. In addition and in contrast to many successful countries in East Asia, Latin American countries did not adopt measures to encourage export orientation of the supported industries, but instead fostered a belief that financial support and protectionist policies established to promote the targeted industries would be in place indefinitely, if necessary. These policies hence discouraged efforts of companies to improve efficiency and productivity and hence contributed to companies' failure to reach the relevant economies of scale. In short, industrial policy in Latin America had "carrots", but lacked "sticks". Furthermore, Latin American governments did not cooperate effectively with the private sector to identify appropriate sectors and interventions to remove binding constraints to growth. Such efforts had led East Asian countries to implement targeted industrial policies, such as selective protection. More generally, implementation of policies often fell short in practice, due to a shortage of skilled civil servants and the absence of a merit-based bureaucracy. This set of circumstances explains why even when industrial policy supported sectors that would have been in line with the country's comparative advantage, it was ultimately not effective due to the way it was implemented.³⁵

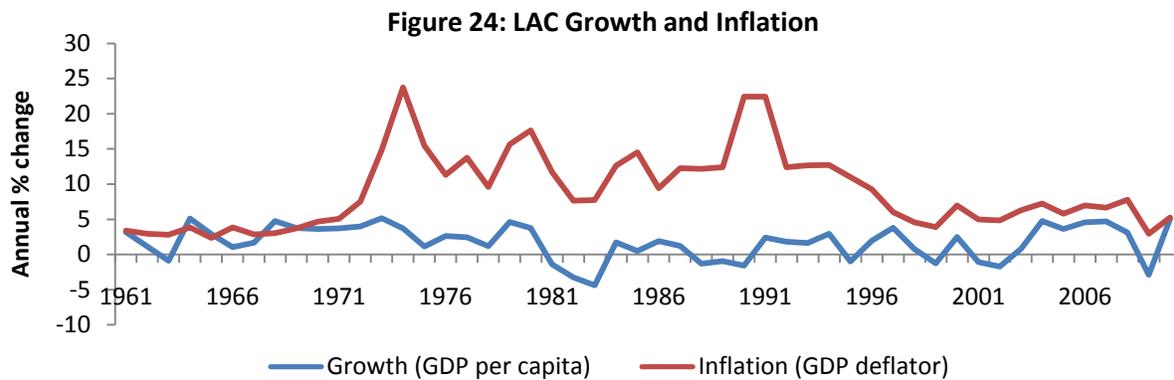
80. The adoption of market-oriented policies under the Washington consensus since the late 1980s and early 1990s aimed at addressing these shortcomings and marked a broad shift away from the interventionist and inward-looking policies followed in the past. The Washington consensus policies focused on government failures, notably macroeconomic instability and constraints to free development of the private sector, and neglected the issues related to structural changes or implicitly assumed structural changes could happen spontaneously. The shift in policy direction of Latin American countries was promoted by the international community—which sought to help the region overcome a history of default and possibly embark on a high-growth path of the type seen in East Asia—also through the substantial debt reduction through the Brady plan in the late 1980s.

81. Under economic adjustment programs undertaken in collaboration with the International Monetary Fund, most Latin American countries began to introduce macroeconomic stabilization programs as well as market-based structural adjustments in a range of areas, especially international trade, the financial sector, the tax system and state enterprises.³⁶ Key components of the adjustment programs varied by country, but there were important commonalities, notably (i) establishing macroeconomic discipline and ending the inflationary financing of government deficits; and (ii) promoting transparency and credibility by centering monetary policy through a fixed exchange rate. Economic openness was promoted through removal of currency restrictions

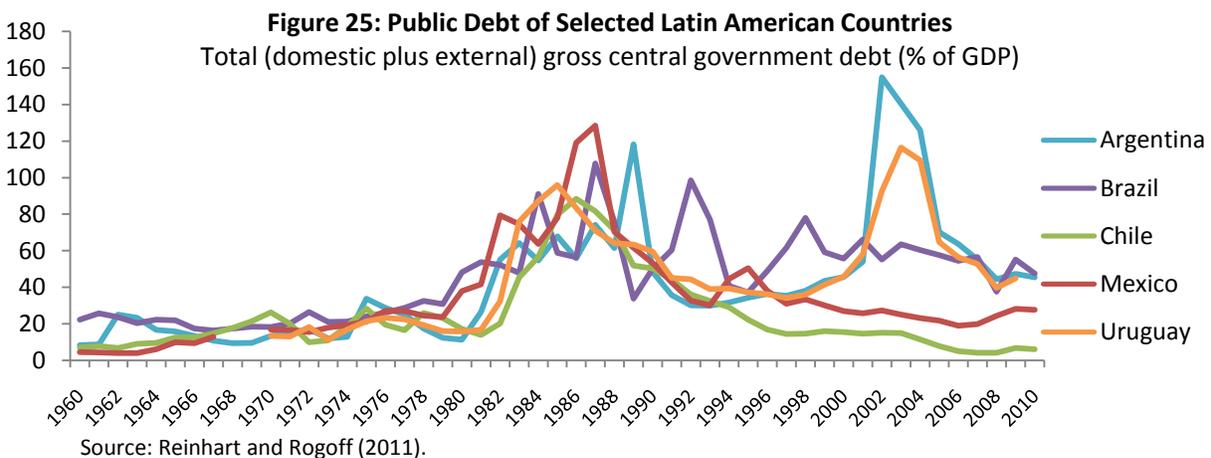
³⁵ For example, Venezuela supported heavy energy-intensive industry which would have been in line with the country's latent comparative advantage; but did not succeed due to a lack of a facilitating environment.

³⁶ Singh et al. (2005).

and liberalization of trade and capital flows, including for foreign direct investment. Extensive restrictions on domestic financial systems were eased, and market access to foreign institutions was increased.



Source: World Development Indicators

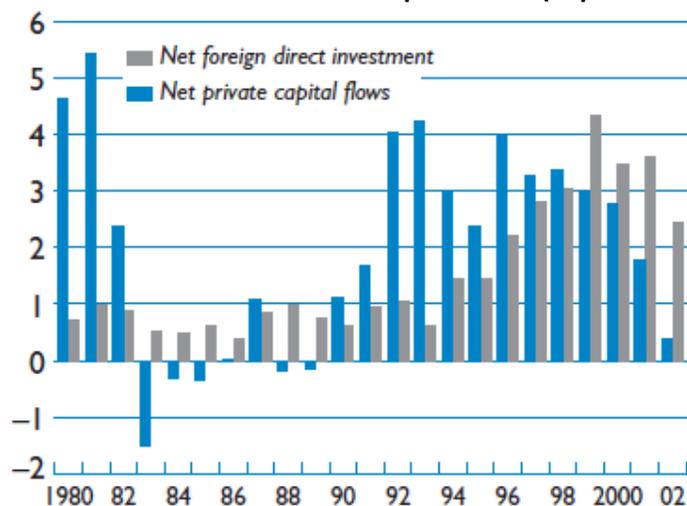


82. In the first half of the 1990s, these stabilization policies succeeded in bringing down inflation—an achievement that has endured since. With the debt overhang resolved and reforms under way, private capital flows resumed. In conjunction with more liberalized domestic financial markets, domestic spending rose, real growth accelerated, and social indicators began to improve.

83. Yet, towards the end of the 1990s signs of fragilities became evident with Mexico’s “tequila” crisis and contagion to other major economies in the region. In parallel, in the wake of the Asian and Russian crises, investor appetite for global risk declined; and the consequent sudden reversals of capital inflows accentuated inherent vulnerabilities in many Latin American economies and led to economic and financial crises in Brazil and Ecuador (1999), Argentina (2001), and Brazil and Uruguay (2002)) and other countries in the region also came under pressure (Figure 26).

84.

Figure 26: Latin America: Net Private Capital Flows (In percent of GDP)



Source: IMF, World Economic Outlook, various issues.

85. These vulnerabilities included rising levels of public debt, weak financing structures and a long history of debt crises. Importantly, while debt/GDP ratios in the range of 40-50 percent were not notably high by international standards, they concealed important weaknesses, including the fact that (i) debt ratios were drifting up even when economic conditions were good and (ii) a lack of credibility led to a reliance on dollar- or interest-linked debt, leaving debt stocks vulnerable to sharp jumps in real exchange rates.

86. These macroeconomic vulnerabilities reflected to a certain extent the region's sluggish growth performance. Although growth had picked up at the beginning of the 1990s, it slowed down considerably towards the end of the decade, partly because of undesired side-effects of policies pursued under the Washington consensus (Figure 24). In fact, when the old structuralist policies were replaced with macroeconomic stabilization programs under the Washington consensus involving sharp cuts in expenditure, many of the non-viable state-owned enterprises failed to survive. High unemployment was the consequence which led to demands for more social protection and to large increases in spending on social programs. Yet, with many of the public enterprises not performing well, the revenue base crumbled, leading to a further widening of the fiscal deficit. In addition, weak collection mechanisms and frequent tax amnesties further narrowed the revenue base. Under pressure from the public, subsidies and other payments to state-owned enterprises were in some cases restored or even increased to salvage them. Inflexible arrangements with sub-national levels of government further limited the scope for expenditure cuts and effective expenditure control.³⁷

87. In an attempt to control the budget deficit, governments cut infrastructure spending—increasing costs of doing business—and increased taxes which often pushed companies into the

³⁷ Singh et al. (2005).

informal sector and prevented them from reaching adequate economies of scale.³⁸ In a vicious cycle, these policies suppressed growth, eroded popular support for policies and further complicated fiscal control, leading to widening budget deficits and further cuts in expenditure on infrastructure (Box 2).

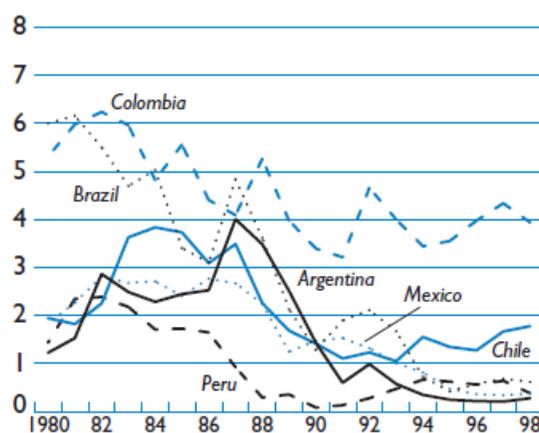
³⁸ One of the countries that achieved successful fiscal consolidation in the 1990s was Chile. Net government debt to GDP fell from more than 40 percent of GDP in 1989 to about 10 percent of GDP in 1996, reflecting strong expenditure adjustment complemented by growth in the tax base owing to expanding activity.

Box 2: Infrastructure Spending and Growth in Latin America¹

Weak fiscal institutions and spending rigidities have complicated the task of budget consolidation in Latin America. As a result, adjusting measures have tended to focus on a narrow spending base—frequently public infrastructure spending. Although cuts in this area narrow the fiscal deficit in the near term, public sector capital formulation is neglected. This, in turn, lowers longer-term output growth and government debt-servicing capacity. Since the mid 1980s, infrastructure spending as a share of GDP has fallen in most Latin American countries (Figure 1). Empirical evidence suggests that fiscal consolidation has played a small but significant role; negative time trends indicate that other factors have been important as well. One explanation is that privatization—and thus private investment—simply displaced public infrastructure spending. Statistical tests reveal, however, that lower infrastructure spending was not matched by higher private investment.

Owing to persistently weak infrastructure spending in Latin America, the quality and quantity of its public assets have decreased relative to those of other developing regions. Compared with the fast-growing East Asian economies, for instance, Latin America's infrastructure shortfall—that is, East Asia's infrastructure stock per worker minus that in Latin America—has widened dramatically since the early 1980s.

Selected Latin American Countries: Public Infrastructure Investment (in percent of GDP)



Source: International Monetary Fund.

Empirical studies confirm that infrastructure compression has negatively affected overall economic growth:

On average, reduced infrastructure spending has lowered long-run GDP growth by 1 percentage point per year. Results vary from 3 percentage points in Argentina, Bolivia, and Brazil; to 1½-2 percentage points in Mexico, Chile, and Peru; and to very little in Colombia and Venezuela, where investment cuts were modest.

The gap in GDP per worker between East Asia and Latin America increased by about 90 percent during 1980-97. About one-third of this appears to be linked to Latin America's relatively weak public infrastructure spending.

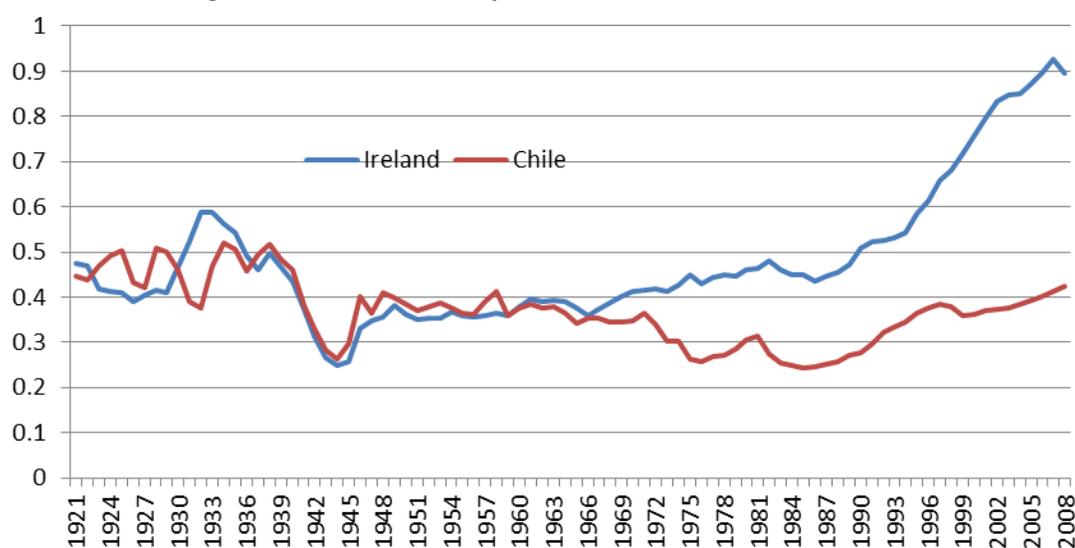
This box draws on Calderón, Easterly, and Servén (2002a, 2002b); and Calderón and Schmidt-Hebbel (2003).

88. In the course of the crisis, real per capita GDP contracted by more than 1 percent on average during 1997-2002 and the improvement of social indicators came to a halt in many countries, although Chile and Mexico were generally able to resist these pressures and maintain

positive growth. As real per capita GDP in the region stagnated over the period 1998-2003, income inequality remained very high and undermined support for market reforms and trust in government institutions.

89. Although countries have made significant progress in macroeconomic stabilization since the crisis, Latin America remains in a middle-income trap. Latin American countries have been increasingly concerned over this situation and sought to create avenues for exiting middle-income status, leading to a revival of industrial policy.³⁹ The middle-income trap is not a destiny, as demonstrated by the newly industrialized East Asian economies and Ireland, which had a growth performance similar to Chile up to the mid-1960s (Figure 27). New approaches to development thinking offer insights into strategies that may allow Latin American countries to leave the middle-income trap. We highlight these approaches further below.

Figure 27: Ratio of Per Capita Income to the United States



Sources: Maddison (2006).

³⁹ For an overview of these policies, see Devlin and Mogueillansky (2012).

IV. New Structural Economics and Growth Identification and Facilitation

90. How to promote economic growth has been a main topic for economic discourse and research since the publication of Adam Smith's *The Wealth of Nations* in 1776. Theories and empirical evidence show that market mechanisms, supported by free and fair competition among market participants, are essential for valuing the basic ingredients for production (factor endowments), providing the right price signals, and implementing an appropriate incentive system for the efficient allocation of resources. Market mechanisms alone, however, may not be sufficient. The government has a potential role to play in helping firms overcome the various information, coordination, and externality problems, which inevitably arise in the process of structural change inherent in modern economic growth. Historical evidence shows that all countries that have successfully transformed from agrarian economies to modern advanced economies had governments that played a pro-active role in assisting individual firms in overcoming the coordination and externality problems in the process of their structural transformation. In fact, governments in high-income countries today continue to play that role.

The determinants of structure and structural change

91. Importantly, a country's endowment structure is not static, but will depend on the rate of capital accumulation and of technological progress. The change in relative prices associated with these changes will affect the type of industries in which the country has a comparative advantage and hence the optimal industrial structure, given that, in order to be competitive, the new industry needs to be consistent with a country's latent comparative advantage, i.e. in which the country can be competitive internationally based on factor costs of production, but is uncompetitive due to high transaction costs. Of particular importance to the latent comparative advantage is the wage level. By imitating or licensing to obtain technology—a process that is less expensive than inventing the technology on their own—low-income countries will be able to produce the same commodities at a significantly lower cost than countries with a similar endowment structure but higher wages provided the enabling conditions have been created. That way the country can exploit the latecomer advantage by developing matured industries in dynamically growing, more advanced countries with endowment structures similar to theirs. By following carefully selected lead countries, latecomers can emulate the leader-follower, flying-geese pattern that has served well all successful economies since the 18th century.

92. The main goal in the formulation of economic policy is to ensure that the economy grows in a manner that is consistent with its comparative advantage. That way, the economy will be competitive, profits will be maximized, and capital accumulation will be the largest. Higher profits and capital accumulation will also positively affect savings and investment, thus creating the basis for even higher growth and investment. As capital accumulates, however, the economy's factor endowment structure evolves, resulting in a gap between the current and the optimal industrial structure. Firms then need to upgrade their industries and technologies accordingly in order to maintain market competitiveness. The government needs to help overcome the information, coordination and externality issues to facilitate firms' industrial upgrading and diversification. The evolution of the factor endowment not only determines a country's latent comparative advantage, but also which stage of production the country should specialize in. Hence, it not only addresses the question of "what" a country should produce, but also "how" it should produce it. Recent research by Lederman and Maloney (2012) underscores

the importance of ~~“how”~~ countries are producing goods as being more relevant than ~~“what”~~ countries are producing.⁴⁰

93. The importance of institutions for growth has been widely recognized. Many economists working on development and transition have come to believe that institutions—which shape the incentive of a society—are the fundamental determinant of economic performance and long-run growth in a country. They believe that a country will have dynamic growth and become rich if it has good institutions, which provide incentives for work, accumulate human and physical capital, acquire better technology and improve resource allocation. We agree with this argument and that the design of a growth strategy needs to take the current state of institutions as a given in the short run. However, institutions are, however, endogenous, and are determined by other social, economic and political factors in the economy (Binswanger and Ruttan, 1978; Friedman, 2005; Hayami and Ruttan, 1985; North, 1981; Lin, 1989; and Lin and Nugent, 1995). Moreover, while we agree with the importance of institutions, the distortions in Latin America, introduced in the 1940s and onward, were mostly due to the need to protect nonviable firms as a result of adopting a Comparative Advantage Defying Strategy. In the case of Latin America, economic performance lagged behind that in North America only after Latin America had adopted an import substitution strategy in the 1930s, and also because many institutional distortions arising from the import substitution strategy, such as the depression of agricultural and mineral prices, were harmful to the interests of the ruling land-owning elite.⁴¹

The roles of the market and the state in structural change

94. The process of upgrading the industrial structure to a higher level consistent with the factor endowment cannot rely solely on the market mechanism. Governments need to play a proactive role in facilitating industrial upgrading and diversification in the development process for the following information, coordination, and externality reasons:

95. First, the decision to upgrade to an industry or to diversify business toward an activity that is consistent with a country's latent comparative advantage, as determined by the change in endowment structure due to the accumulation of capital, is never an obvious choice. A pioneer firm may fail due to the lack of complementary inputs or adequate infrastructure for the new industry or it may simply be that the targeted industry is not consistent with the economy's comparative advantage. Industrial upgrading and diversification are therefore likely to be a costly trial-and-error exercise of discovery even with the advantage of backwardness (Hausmann and Rodrik 2003).

⁴⁰ Lin (2007).

⁴¹ We would thus disagree with the argument of Engerman and Sokoloff (1997) who based on the early history of colonies in the New World after the sixteenth century state that in the colonies that were endowed with climates and soils that gave them a comparative advantage in plantation of sugar and coffee—lucrative crops at that time—or were rich in minerals (such as Latin America), the production used a large number of slave labor because of the economies of scale in using such labor, and consequently the powerful colonial elites were able to establish social and political institutions that guaranteed them disproportional shares of political power and income distribution in order to maintain their status—at the cost of economic growth.

96. In order to be successful in a competitive market, firms in a developing country need information about which industries within the global industrial frontier align with the country's latent comparative advantage. Information has the same properties as public goods. The costs of collecting and processing information are substantial. However, the marginal cost of allowing one more firm to share the information is almost zero once the information is generated. Therefore, the government can play a facilitating role by investing in information collection and processing and making information about the new industries that are consistent with the country's latent comparative advantage freely available to firms. In addition, the choice of a new industry may also shape the economy's future growth potential in a path-dependent way through the accumulation of specific human and social capital. The government is better than individual private firms at analyzing information about how each new industry may shape the economy's future growth path and making that information available to the public.

97. Second, technological innovation, industrial diversification, and industrial upgrading are typically accompanied by changes in capital and skills requirements for firms, as well as changes in their market scope and infrastructure needs due to the evolving nature of production that is inherent in the process. In other words, industrial upgrading and diversification are typically accompanied by changes in hard and soft infrastructure requirements. For example, with the change from agrarian production to manufacturing and from simple manufacturing to advanced manufacturing in the development process, the scale of production and market scope become increasingly large. The demand for transportation, roads, and power increase accordingly. Individual firms are not capable of internalizing these provisions or deploying the kind of coordination efforts among firms in different sectors needed to meet these increasing demands.⁴² Even if some large companies were willing to finance a national road or a power network, coordination through the public sector would be needed to ensure consistency and efficiency, and to prevent the entrenchment of natural monopolies when the national economy grows. In a low-income country, firms in small-scale, labor-intensive agriculture and manufacturing only need an unskilled labor force and unsophisticated financial and marketing systems to operate, in addition to hard infrastructure. But when the economy expands into modern manufacturing industries, firms need high-skilled labor, large funds for lump-sum investments in equipment, working capital and/or export financing, as well as new marketing arrangements. However, individual firms are usually not capable of internalizing the needed changes in soft infrastructure. Here again, there is a need for the state to provide or coordinate some of those changes in different sectors of the economy so as to facilitate the individual firms' upgrading and diversification.⁴³

⁴² For example, the application of chemical fertilizers in rice and wheat require the use of modern semi-dwarf varieties to avoid the lodging problem, as well as the use of modern seeds that require timely irrigation. Individual farmers will not be able to develop the new seeds or improve the irrigation system by themselves. The application of chemical fertilizers and the use of modern seeds increase the need for access to credit. Changing the financial system to meet these needs is also beyond individual farmers' capacity. Similarly, the diversification from farm to non-farm industries or from small-scale traditional industries to modern industries requires the provision of many new inputs and improvements in hard and soft infrastructure, which cannot be internalized by any individual firm.

⁴³ The success of Ecuador's cut flowers export in the 1980s is a good example. The fact that Ecuador had a latent comparative advantage in producing and exporting cut flowers to the US market was known in the 1970s. However, the industry did not expand and exports did not take off until the government helped arrange regular flights and invest in cooling facilities near the airport in the 1980s (Harrison and Rodriguez-Clare 2010). Ethiopia's experience in exporting cut flowers to the European market tells a similar story. Regarding the provision of skilled labor, Germany's dual system of vocational education and training, involving both in-company training and education at vocational schools, has been a major factor in Germany's economic success over the past six decades.

98. Third, innovation, which underlies the industrial upgrading and diversification process, is by nature a very risky endeavor. Even when governments are willing and capable of helping by facilitating coordination and information sharing among firms, success is not guaranteed. Firms can fail in their attempt to upgrade their activities in new industries because the targeted industry may be too ambitious, or the market too small, or the coordination inadequate. But even such cases of failure offer useful information to other firms: failures indicate that the targeted industries are inappropriate and should be re-examined or demonstrate the lack of appropriate incentives or government facilitation more generally. Therefore, firms that are first-movers pay the cost of failure and produce valuable information for other firms. When the first movers succeed, their experience also provides information externalities to other firms: their success proves that the new industry aligns with the economy's comparative advantage.

Industrial policy and growth identification and facilitation

99. There is considerable historical evidence that today's most advanced economies have relied heavily on precisely these types of government interventions to ignite and facilitate their economic take-off, which allowed them to build strong industrial bases and sustain their growth momentum over long periods. In his well-known survey of trade and industrial policies that led to early economic transformations in the Western world, List (1841) documented various policy instruments through which governments protected domestic industries or even intervened to support the development of specific industries, many of which became successful and provided the bedrock for national industrial development.

100. Chang (2003) reviewed economic developments during the period when most of the present day advanced economies went through their industrial revolutions (between the end of the Napoleonic wars in 1815 and the beginning of World War I in 1914). Contrary to conventional wisdom that often attributes the industrial successes of Western economies to laissez-faire and free-market policies, the historical evidence shows that the use of industrial, trade, and technology policies were critical to their successful structural transformation. The interventions ranged from the frequent use of import duties or even import bans to protect infant industries, to industrial promotion through monopoly grants and cheap supplies from government factories, to public-private partnerships and direct state investment, especially in Britain and the U.S., in addition to various other subsidies (Trebilcock 1981).

101. The U.S. government has constantly offered strong incentives to private businesses and academic institutions to discover new ideas that may be valuable for sustaining growth and has encouraged making such ideas non-rival—in addition to building infrastructure in key economic sectors such as transportation and providing financing to education and training in order to build the country's skills base in many industries. Chang (2003) observes that interventions by the U.S. government have included support to industries such as computers, aerospace, and the internet, where the U.S. still maintains an international edge despite the decline in its overall technological leadership. He notes that these industries would not have existed without defense-related R&D funding by the U.S. government.

102. Also, in the 19th century, all European countries trying to catch up with Britain focused on improving their technology policies. Up until the middle of the first Industrial Revolution, the main channel for technological transfer was the movement of skilled workers who embodied new knowledge. Latecomers to the industrialization process, such as France, attempted to acquire skilled labor on a large scale from Britain, but the government there banned the emigration of skilled workers for more than a century. When new technologies became embodied in machines, they too were put under government control and various laws were adopted throughout the 18th and 19th centuries to ban the export of ~~tools~~ and utensils.”

103. Almost all developing countries have tried to replicate the earlier models of the state-led structural change strategy, especially after World War II (Chenery 1961; Krueger and Tuncer 1982; Lal 1994; Pack and Saggi 2006). However, many countries designed and implemented catch-up strategies that were too ambitious for establishing the “commanding height” given their level of development. Historical examples of such mistakes include when Hungary and Russia tried to replicate industries in place in Britain in the late 19th century (Gerschenkron 1962). Purchasing power parity estimates by Maddison (2006) indicate that Hungary and Russia’s per capita GDP represented 25 and 30 percent, respectively, of that of Britain in 1900, whereas the per capita incomes in successful catch-up countries, such as the US, France and Germany, were 60-75 percent of Britain’s, respectively. Such a large gap made any attempt by Hungary and Russia to develop British industries unrealistic.

104. Most developing countries fell in the same trap after World War II. They often targeted advanced, capital-intensive heavy industries in advanced economies when their per capita incomes represented only a very small fraction of those of high-income countries. In parallel to political aspirations for heavy-industry development, there was an obsession with “market failure” in academic circles—especially in Latin American countries. Many influential economists and policymakers there (Albert Hirschman, Raul Prebisch, Roberto Campos, and Celso Furtado, among others) argued that industrialization and growth could not take place spontaneously in developing countries because of structural rigidities and coordination problems.⁴⁴ They recommended that government support be provided to the manufacturing industry for these countries to catch up with developed countries, regardless of the large income gap with the advanced economies.

105. Too often, such industrial policy defied the prevailing comparative advantage of many poor countries where factor endowments were characterized by the abundance of labor or natural resources. By implementing the capital-intensive, heavy industry-oriented development strategy, they could not build firms capable of surviving in open, competitive markets. Because of their

⁴⁴ The new field of development economics was regarded as covering underdevelopment because “conventional economics” did not apply (Hirschman 1982). Early trade and development theories and policy prescriptions were based on some widely accepted stylized facts and premises about developing countries (Krueger 1997). These included: 1) developing economies’ production structures were oriented heavily toward primary commodity production; 2) if developing countries adopted policies of free trade, their comparative advantage would forever lie in primary commodity production; 3) the global income elasticity and the price elasticity of demand for primary commodities were low; 4) capital accumulation was crucial for growth and, in the early stage of development, it could occur only with the importation of capital goods. Based on these stylized facts and premises, it was logical to believe that development could be achieved through industrialization, and industrialization consisted primarily of the substitution of domestic production of manufactured goods for imports (Chenery 1958).

high capital needs and their structurally high production costs, these enterprises were not viable. Even when they were well managed, they could not earn a socially acceptable profit in an undistorted and competitive market. A good example is Egypt's industrialization program in the 1950s, which featured heavy industries such as iron, steel, and chemical manufacturing. The country's per capita income represented about 5 percent of that of the U.S., the world's most important steel producer at the time. Unless the government continuously provided costly subsidies and/or protection, Egyptian firms could not attract private investment. The limited fiscal capacity of the state made such large-scale protection and subsidies unsustainable. In such situations, governments have had to resort to administrative measures—granting market monopolies to firms in the so-called priority sectors, suppressing interest rates, over-valuing domestic currencies, and controlling the prices of raw materials—in order to reduce the costs of investment and to ensure the continuous operation of their non-viable public enterprises (Lin 2009).

106. A good summary of the research findings on how to achieve sustained growth through structural transformation and the diffusion of ideas and accumulation of knowledge can be found in Romer (1992). Romer notes that “the challenge is to find better forms of government intervention, ones that have better economic effects and pose fewer political and institutional risks” (Romer 1992, p. 66). He also points out that the “temptation for economists, however, has always been to duck the complicated political and institutional issues that this kind of analysis raises and instead to work backward from a desired policy conclusion to a simple economic model that supports it.”

107. Korea's experience demonstrates the effective use of industrial policy to promote structural change and upgrading. In the 1980s, the Park Chung Hee government implemented three interrelated sets of economic policies that came to define the Korean model of development. The government accommodated demands by the U.S. and instituted a set of macroeconomic reforms designed to stabilize the economy. Orthodox macroeconomic reforms ensured that Korea's state-led development model would be market-based. But these orthodox macroeconomic policies were accompanied by unorthodox measures that introduced distortions into microeconomic incentives and aimed at supporting growth in sectors with the highest growth and employment potential. First, the government adopted drastic measures to share the investment risks of the private sector, providing, in particular, explicit repayment guarantees for foreign loans extended to private sector firms. Second, Park himself spearheaded the effort to boost exports, offering various incentives based on market performance. The resulting government-business risk partnership for which the export market performance of private firms was used as a selection criterion defined the core of what later came to be known as the “Korean model”.⁴⁵ Third, the Korean government's drive was also helped by its ambition and the fact that government structures were autocratic which eased implementation.⁴⁶

108. One of the most important constraints to greater investment by the private sector in Korea in the early 1960s was financing. With a view to facilitating foreign financing, the government

⁴⁵ Lim (2011).

⁴⁶ In this context, it is important to note that NSE-type applications were also successfully implemented in democratic countries, such as Ireland (which effectively targeted industries consistent with latent comparative advantage, and Mauritius whose democratic structures were still evolving.

decided to guarantee private sector foreign borrowing. Thus the government took it upon itself to resolve the information asymmetry problem for international financial institutions which at the time were not willing to examine the creditworthiness of Korean firms. In taking this measure, the Park government signaled that it was willing to form a risk partnership with the private sector and that combining state monitoring with private entrepreneurship would be the most effective means of carrying out the economic development plan. Through direct monitoring and performance-backed support, the government tried to contain the potential costs of state-backed debt financing. All foreign loans had to be authorized by the government and were allocated according to the policy priority of investment projects.

109. Korea also introduced a number of export promotion measures, including the automatic approval of loans by commercial banks to those with an export letter of credit which allowed businesses to access trade financing without having to put up collateral. The government also gave exporters various tax deductions, wastage allowances, tariff exemptions, and concessional credits. For example, exporters were entitled to automatic import rights and to easy customs clearance. They also were allowed to import more inputs than was essentially needed as “wastage allowance”. Given that the value of imports was still very high, this helped to increase the profitability of exports. The interest rate on export loans was also subsidized from the mid-1960s to the beginning of the 1980s.

110. Crucial to the export promotion efforts of the government were also consistent follow-up meetings between the government and the private sector which provided opportunities to secure sustained attention from top leadership, monitor progress on a long-term vision, and detect and mitigate constraints as they emerged.

111. In the 1960s, Korea also launched an outward-oriented “industrial upgrading” program. The new program recognized the link between industry and trade and explicitly adopted a science and technology agenda. In pursuing industrial upgrading, Korea systematically studied what had to be done to fill the missing links in the domestic value chain and move up the quality ladder and made conscious and concerted efforts to aim for international competitiveness from the outset. Crucially, after exploiting its comparative advantage to develop labor-intensive downstream industries, Korea aimed at indigenizing intermediate inputs imported from foreign upstream industries through technology acquisition, human resource development, and construction of optimal-scale plants aimed for the global market. For instance, in the chemical-textile value chain, Korea systematically built the links backward from export of textiles to production of synthetic fibers, to development of basic petrochemicals. To promote heavy and chemical industries, the government essentially had to secure scale economies, make massive complementary investments and develop technical manpower with requisite skills.

112. To minimize time and exploit scale economies in establishing capital-intensive industries, the government decided to rely on a select group of state-owned enterprises and chaebol with a successful track record such as POSCO and Hyundai. The government provided them with extremely generous financial support, restricted entry into targeted industries and used direct monitoring rather than competition to ensure good performance.

113. To provide infrastructure such as water, electricity, and transportation and to secure backward and forward links, the government enacted the Industrial Complex Development Promotion Law in December 1973 and set up a machinery complex and an electronics complex. These investments were accompanied by construction of accommodation and institutes of higher education dedicated to specialized engineering. Korea also greatly expanded technical and vocational training and set up labs to conduct R&D. To support the HCI drive, the government also drafted a manpower development plan.

114. Although capacity underutilization was a major problem at the end of the 1970s, the HCI drive built the foundation of many of Korea's leading industries such as steel, shipbuilding, machinery, electronics and petrochemicals. It greatly strengthened backward and forward linkages among these industries, as well as related industries such as automobiles, to increase the local content of exports. It also set the stage for Korea's transition to an innovation-driven economy by expanding technical and engineering education and establishing a nucleus of R&D labs.

115. While the government initially played a dominant role in R&D, Korean firms increasingly realized that succeeding in global markets required their own innovative efforts. As a result, they drastically increased their R&D spending, in part encouraged by government support. Korea's gross R&D expenditure increased from less than 0.5 percent of GDP in the early 1970s to approximately 3 percent of GDP in the mid-2000s. Over the same period the private sector share of R&D spending increased from 20 percent to 75 percent. The number of researchers also increased from 6000 to 220000 and Korean companies increasingly relied on their own research.

116. As a result of these policies, Korea successfully exploited its latent comparative advantage in labor-intensive industries in the 1960s and then systematically developed its potential comparative advantage in machinery and equipment industries starting in the late 1960s. Crucial to this success was a partnership between government and business which promoted "rapid and shared growth" through export-oriented industrialization and human resource development.

117. In implementing its industrial policy Korea decided to "pick winners" and support them pro-actively through a variety of measures. Picking winners has been controversial and past experience in Latin America in this area has been negative. When governments picked winners they often ended up adopting a form of state-led development paradigm that led to inefficient economic structures and the fiscal costs and slow growth described above. Governments had to use monopolies as a way to protect non-viable firms in the priority sectors that were inconsistent with the country's comparative advantage. Hence, many of the policies pursued under this paradigm were inconsistent with an effective competition policy aimed at ensuring free and fair competition. Yet, Latin America should be implementing industrial policy in the right way, taking into consideration the experience in other countries, notably in East Asia.

118. Industrial policy based on New Structural Economics and the Growth Identification and Facilitation Framework supports firms in the targeted sectors that are viable because they are in line with the country's latent comparative advantage. Government interventions to support

industrial upgrading and diversification based on this framework will be consistent with the goal of competition policy. This is because the government's incentives for investments are used to compensate first movers for the externalities they create, rather than address the firms' viability problem. A limited tax holiday or discrete subsidy would be sufficient. The government's interventions focus mainly on areas that overcome the coordination failures to facilitate competitiveness of the targeted industries. Why does the government have to pick specific industries for its interventions?

119. First, coordination problems are specific to different sectors and need to be solved by aiding with the creation and development of clusters, special economic zones, and other competition-based industrial policies. The required infrastructure improvements are often industry-specific. The cut flowers industry requires different infrastructure for their exports than the textile industries. Since a developing country's fiscal resources and implementation capacity are limited, the government has to prioritize the infrastructure improvement according to the targeted industries.

120. Second, as discussed above, no matter its success or failure, a pioneer firm in industrial upgrading and diversification provides information externalities to other firms. If it fails, the firm needs to bear all the costs of failure. If it succeeds, other competitive firms will enter and the pioneer firm will not be able to earn extra profits. Due to the asymmetry between the cost of failure and the gain of success, a firm's incentive to be the pioneer will be low. A broad-based intervention cannot solve the need for compensating pioneer firms.

121. Third, to compete in the globalized world, a new industry not only must align with the country's comparative advantage so that its factor costs of production can be at the lowest possible level, but also the industry needs to have the lowest possible transactions-related costs. Suppose a country's infrastructure and business environment are good and industrial upgrading and diversification happen spontaneously. Without the government's coordination, firms may enter into too many different industries that are all consistent with the country's comparative advantage. As a result, most industries may not form large enough clusters in the country and may not be competitive in the domestic and international market. Only in the wake of many failures may a few clusters emerge eventually. Such a "trial and error" is likely to be a long and costly process, reducing the individual firms' expected returns and incentives to upgrade or diversify to new industries. This in turn can slow down a country's economic development.

The Growth Identification and Facilitation Framework

122. Modern economic growth is a process of continuous industrial upgrading and structural change. To achieve dynamic growth, a developing country should develop industries according to its comparative advantage, which is determined by the country's endowment structure, and tap into the potential advantages of backwardness in industrial upgrading. The key to successful industrial policy is thus to identify sectors in which a country has a latent comparative advantage. This comparative advantage is intrinsically dynamic and changes in the growth process, as the country moves up the value-added ladder. The Growth Identification and Facilitation Framework, based on New Structural Economics, proposes a six-step process (Lin 2012, chap. 3):

- The first step consists of identifying tradable goods and services that have been growing dynamically for about 20 years in fast-growing countries with similar endowment structures that have a per capita GDP about 100 percent higher than that of the emerging market. In many cases, given that wages tend to rise in the growth process, a fast-growing country that has produced certain goods and services for about 20 years may begin to lose its comparative advantage in those sectors, leaving the space for countries with lower wages to enter and compete in those industries.
- Second, among the identified industries, the government may give priority to those in which some domestic private firms have already entered spontaneously. The government may then try to identify: (i) the obstacles that are preventing these firms from upgrading the quality of their products; or (ii) the barriers that limit entry to those industries by other private firms. This could be done through the combination of various methods such as value chain analysis or the Growth Diagnostic Framework suggested by Hausmann, Rodrik, and Velasco (2008). The government can then implement policies to remove those binding constraints and use randomized controlled experiments to test the effects of releasing those constraints so as to ensure the effectiveness of scaling up those policies at the national level.
- Third, some of the identified industries may be completely new to domestic firms. In such cases, the government could adopt specific measures to encourage firms in the higher-income countries identified in the first step to invest in these industries. Firms in these higher-income countries will have incentives to reallocate their production to the lower-income country so as to take advantage of the lower labor costs. The government may also set up incubation programs to catalyze the entry of domestic private firms into these industries.
- Fourth, in addition to the industries identified on the list of opportunities for tradable goods and services in step one, developing country governments should pay close attention to successful innovations by domestic private enterprises and provide support to scale up those industries. Due to rapid technological changes, many new opportunities may arise—opportunities that would not have existed a decade or two ago, as those industries did not exist in the rapidly growing comparator countries.
- Fifth, in developing countries with poor infrastructure and unfriendly business environments, the government can invest in industrial parks or export processing zones and make the necessary improvements to attract domestic private firms and/or foreign firms that may be willing to invest in the targeted industries. Improvements in infrastructure and the business environment can reduce transaction costs and facilitate industrial development. However, because of budget and capacity constraints, most governments will not be able to make the desirable improvements for the whole economy in a reasonable timeframe. Focusing on improving the infrastructure and business environment in an industrial park or an export processing zone is, therefore, a more manageable alternative. Industrial parks and export processing zones also have the benefits of encouraging industrial clustering. The industrial parks would need to be tailored to the specific requirements of the targeted industry, however.

- Sixth, the government may also provide limited incentives, such as tax holidays or preferential access to credits and/or foreign exchanges, to domestic pioneer firms or foreign investors that work within the list of industries identified in step one in order to compensate for the non-rival, public knowledge created by their investments. Incentives should not, and need not, be in the form of monopoly rent, high tariffs, or other distortions as the firms in the targeted industries should be viable in open, competitive market.

V. Turning LAC's Resources into a Blessing – Applying the GIFF to a Middle-Income Country

123. The review of Latin America's performance suggests that the region's productive sectors and entrepreneurial spirit have not been developed enough to reach beyond obvious static comparative advantage, for example by occupying openings for upgraded activities created by countries moving out of higher-level industries where they are losing competitiveness.⁴⁷ In fact, the region's static comparative advantage is not enough to produce the very high rates of growth that the region needs to sustain for decades if its income levels are to converge with those of rich countries. Productivity also lags its competitors in many areas of existing comparative advantage.

124. Many countries in Latin America are resource rich, and the question arises how their natural resource wealth can be turned into a blessing. As discussed above, large capital inflows related to exports of natural resources often cause an excessive appreciation of the exchange rate—also referred to as Dutch disease—which adversely affects the economies' competitiveness. To address these challenges and manage natural resource wealth, the literature has generally emphasized the importance of good governance through effective public expenditure management as well as the need to create sovereign wealth funds to smooth out undesirable expenditure fluctuations. We agree with these policy recommendations. Yet, the theoretical framework of New Structural Economics and 6 steps to implement the Growth Identification and Facilitation Framework and lessons from the development experience of East Asia provide the basis for Latin America to turn resources into a blessing and take advantage of opportunities arising from the new structure of the world economy.⁴⁸ One of the central aspects of this framework is the need to use the advantage of backwardness for industrial upgrading and diversification to achieve a dynamic change in industrial structure. While this may be obvious for a developing country, how can a middle-income country have an advantage of backwardness?

125. A middle-income country may still suffer from some of the symptoms of “backwardness”—sectors or industries that are within the global frontiers. Technologies in those sectors still trail the high-income countries. Some high value-added sectors in high-income countries are also missing in their industrial structure. In addition, the typical middle-income

⁴⁷ Devlin and Moguillansky (2011), p. 236.

⁴⁸ Examples of countries that turned a resource curse into a blessing are Botswana, Finland, and Sweden.

country possesses sectors or industries that may be highly developed—and may even be at the global technological frontier. For example, a middle-income country might produce some household appliances like microwaves, DVD players, air conditioners, and washing machines, as in China, or have a middle-range, regional aircraft manufacturer, like Embraer in Brazil, that has reached the global technological frontier in these categories of products and high-income countries have given up production in these categories of products.

126. Overall, while a few adjustments would be necessary to the basic framework presented above to work well in middle- and high-income countries, much of the difference in application is in emphasis rather than substance. The GIF framework provides a step-by-step approach to identifying industries that are part of a country's latent comparative advantage, and, with the right support, could be the new growth sector. For middle-income countries, a key element and starting question is (i) which high value-added industries that exist in advanced countries are missing in their industrial structure, and (ii) among their existing industries which are still *within* the global technological frontier (even if more advanced than rudimentary sectors in low-income countries) and (iii) which are already *on* the global technological frontier. Most middle-income countries have economic structures that include all three types of industries. Even high-income countries possess those three types of industries, but often most of their existing industries are already at the global technological frontier. A preliminary step should be to separate existing domestic industries into categories, and adjust the sequential GIF steps accordingly.

127. For industries that are already *on* the global technological frontier, if the country intends to stay in those industries, firms in the industries need to create continuously new processes, new products, and new technologies—thus advancing the frontier. Governments can facilitate such industrial upgrading by providing support for Research and Development—with a view to creating the required innovative activities through granting patents to new technologies, supporting basic research, government's procurements and mandating the use of new products, as are commonly practiced in advanced countries. For a country to upgrade or diversify to new industries that locate *within* the global technological frontier, the six steps in the GIF framework are useful for selecting the industries and identifying the required government interventions.

128. Examples abound of middle-income countries whose successful industrial and technological upgrading strategies can be explained by the GIF framework. India is well known for the recent rapid growth of information and communication technology industries, and it is one of the most successful middle-income countries in this sector. Public sector support was critical to this success. Information-service-outsourcing firms require computer hardware to work on their call centers, programming, and so on. They need the latest cutting-edge technology to be productive in providing those services. During the early years of this sector's development in India, the government provided support through special privileges to import hardware.⁴⁹ Naturally, earlier public investment in tertiary education and the timely development of land-based telecommunication to replace high-cost satellite communication were also important.⁵⁰

129. India's economic history also provides examples of government facilitation in more traditional agricultural sectors—compatible with the country's comparative advantage in labor-

⁴⁹ Bhatnagar (2006).

⁵⁰ Regarding details of India's support for IT industry, see also Lin (2012b).

intensive activities. These industries are typically within the global technological frontier. With government support, farmers engaged in technological upgrading and thus improved productivity. For grape production, government action was consistent with the GIF framework: small growers were conducting successful experiments to increase production, and this caught the government's attention. Policymakers then initiated public-private partnerships to support technological upgrading and market development that promoted grape exports.⁵¹

130. Sometimes supporting technological upgrading requires various sectoral reforms. India's successful maize production also illustrates the effectiveness of that strategy. First, the government decided to liberalize the sector, lifting a ban on imported maize seed technology. This created healthy competition between domestic and foreign laboratories (including government research centers) to adapt imported technology to local conditions. Second, it was deemed necessary for the state to play a direct role in unleashing the potential for the sector; strong public investment took place in maize research, and producers were given public access to breeding material the government developed. Without this government support, domestic companies probably would not have entered the seed sector and competed with multinationals.⁵²

131. Brazil also offers examples of effective growth identification and facilitation both in traditional agricultural sectors and in newer, higher technology ones. It has been an important producer of agricultural commodities since colonial times. For example, coffee was the traditional export crop that was the basis of the wealth of landowning elites in the state of São Paulo in the 19th century. More recently, Brazil has become an innovative global force in agriculture, as the world's largest exporter of many products, including beef. And controversial, long-standing government support for bio-fuels production has put Brazil at the global technological frontier in that —new age” product.

132. Consistent with the new structural economics and GIF principles, the government identified key constraints to private initiatives, and provided key public goods in the form of basic research for use by private firms. An important government organization behind the success is EMBRAPA—the national agricultural research and extension agency. R&D allowed the country to improve productivity in both traditional and new crops, and to transform previously underused areas, like the savannahs. Econometric studies show that R&D and infrastructure improvements were essential to increasing agriculture's productivity.⁵³

133. But education and R&D are not enough to facilitate the necessary industrial upgrading. A further crucial area for targeted interventions of the government to facilitate industrial upgrading is physical infrastructure, which has become a bottleneck to growth for many LAC countries. Improving infrastructure affects productivity and output through a variety of channels. In the short run, infrastructure investment can create jobs and growth in the local economy. In the longer run, it raises a country's output, by enhancing productivity, increasing private capital formation (by raising expected returns on private investments as the marginal productivity of inputs increases or transaction costs decline), facilitating the exploitation of agglomeration economies, and enhancing human capital. Calderon and Servén (2010) find that if each Latin

⁵¹ Naik (2006a).

⁵² Naik (2006b).

⁵³ Barreto and Almeida (2009); Mendes, Teixeira, and Salvato (2009).

American country matched the average level of infrastructure observed among non-LAC middle income countries (such as Turkey or Bulgaria), growth in Latin America would rise by approximately 2 percentage points per year.

134. The private sector generally engages in infrastructure financing through public-private partnerships (PPPs), which are established through a long-term contract between a government and a private investor, bundling investment and service provision into a single long-term contract. The investor (or mostly a group of private investors) finances and manages the construction of the project, maintains and operates it over the time of the contract (usually around 20 to 30 years), before transferring the assets to the government. During the operation, the investor receives a stream of payments, e.g. through user fees or government payments, as a compensation.

135. As infrastructure assets are illiquid, upfront capital financing is large and repayments often take decades, PPPs entail significant risks for the investor. These risks include higher than projected projects costs; shortfalls in projected revenues, e.g. as the demand for the infrastructure services and user-fees are lower than projected; exchange-rate risks if infrastructure financing is provided in foreign currency and user fees are paid in domestic currency; force majeure; or political and regulatory risks. It is therefore not surprising that the private sector involvement in developing countries is still limited.⁵⁴ This lack of financing and involvement of the private sector in infrastructure development represents an important obstacle to improving infrastructure.

136. With a view to incentivizing the private sector to participate in PPP's, governments can and should play a crucial role to diversify some of these risks and make investments in developing countries more attractive. Government guarantees, can insure against project related risks, such as a shortfall in demand. As discussed further above, Korea was very effective in implementing mechanisms to diversify risks.

137. Even more promising than guarantees that diversify risks - albeit at a cost - is the possibility of actually reducing the risk. Governments can span a wide range of actions, including improving the regulatory framework and implementing sound macroeconomic policy. In economies with high country risks, investors in infrastructure often ask real returns on equity in the order of 20 percent or more and a country risk premium of up to 5 percent on debt (Klein, 2005). Similarly, Guasch (2004) shows that regulatory risks to investments in Latin America can add up to 6 percent to the cost of capital. Analyzing credit spreads of infrastructure bonds, Dailami and Hauswald (2003) find that projects located in host countries with a stronger legal framework have lower funding costs and tighter spreads. And at the end, only sustained macroeconomic stability will bring the desired investment grade rating which is essential to tap the large saving of institutional investors at attractive prices. Multilateral institutions and bilateral agencies can play an important role by building capacity and supporting improvements in these areas.

⁵⁴In low-income countries, demand for infrastructure services may simply not high enough to attract private investors. This affects particularly Africa where population density is low. As a result, private investment in power, water or railways has been very limited (Foster and Briceno-Garmendia, 2010).

Concluding Remarks

138. Modern economic growth is a process of continuous industrial upgrading and structural change. To achieve dynamic growth, a developing country should develop industries according to its comparative advantage, which is determined by the country's endowment structure, and tap into the potential advantages of backwardness in industrial upgrading. In order to be competitive in the new world economic order and rise from the middle-income trap, Latin America needs to upgrade its industrial structure continuously. At this juncture, Latin America's product mix lacks diversification, has not improved in terms of sophistication and has not been adaptable to changes in demand in key export markets. Compounded by the appreciation of the exchange rate related to the commodities boom and large foreign capital inflows, Latin America has lost competitiveness and is now at risk of deindustrialization. This could exacerbate its exposure to fluctuations of the world economy and the business cycle in main export markets in advanced and emerging markets.

139. Industrial upgrading and diversification would be essential to avoid further deindustrialization arising from the competitive pressures of the rise of China, broaden the base for economic growth and create the basis for further sustained reduction in unemployment and poverty and improvements in income inequality. Building on the work of Lederman et al. on Latin America's revealed comparative advantage, this paper argues that the region's comparative advantage lies in sectors that are intensive in natural resources, scientific knowledge and unskilled labor. To facilitate upgrading to these sectors, the region should make a concerted effort to improve education, research and development, and physical infrastructure. With a view to maximizing the effectiveness of these interventions, it will be important for the region to pick winners, i.e. sectors that correspond to the latent comparative advantage of the economies, and calibrate supporting policies in close collaboration with the private sector through public-private sector alliances. Different from the experience under the old structuralism, industrial policy measures inspired by New Structural Economics will be consistent with the principles of free and fair competition, as the sectors are in line with a country's latent comparative advantage and therefore sustainable.

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