Insights from Latin America for Canada: A Review Article on *The Age of Productivity: Transforming Economies from the Bottom Up*

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**Abstract**

This review article assesses the edited volume *The Age of Productivity: Transforming Economies from the Bottom Up*, which addresses the productivity challenges facing Latin America and the Caribbean. The main message of the volume is that a low level of total factor productivity (TFP) and slow TFP growth account for the region’s large and growing income gaps relative to developed economies and the emerging East Asian economies. High trade costs, a large credit gap, a complex and ineffective tax system, unintended consequences of SME support programs and social policies, and a large innovation deficit are identified as largely responsible for the region’s productivity problems. Given that Canada’s productivity challenge is similar to that of Latin America, the article discusses possible policy lessons for Canada from the region’s experience.

**Résumé**

Ce compte rendu critique analyse l’ouvrage intitulé *The Age of Productivity: Transforming Economies from the Bottom Up*, qui traite des défis que doivent relever l’Amérique latine et les Caraïbes. Le message principal de cet ouvrage est que les écarts importants et croissants en termes de revenu comparativement aux économies de pays développés ou émergents en Asie orientale peuvent s’expliquer par un faible niveau de productivité multifactorielle (PMF) et une faible croissance de cette PMF. Les auteurs attribuent en grande partie les problèmes de productivité de la région à des coûts commerciaux élevés, à d’importants écarts en termes de crédit, à un régime fiscal complexe et inefficace, aux conséquences involontaires de politiques sociales et de programme d’aide aux PME, ainsi qu’à un manque important d’innovation. Observant que l’Amérique latine et le Canada sont confrontés à des défis similaires, le texte examine les leçons politiques que le Canada pourrait tirer de l’expérience de cette région.

*The Age of Productivity: Transforming Economies from the Bottom Up* is a collection of 12 research papers on the productivity challenges facing Latin America and the Caribbean. Published by the Inter-American Development Bank, this volume is the 2010 issue of its flag-
ship publication – *Development in the Americas* – and is devoted to a detailed examination of productivity issues facing the Latin America and Caribbean region. The book is edited by Carmen Pagés, a principal research economist in the Research Department of the Bank.

The central message of the book is that the low TFP level and slow TFP growth are the main reasons behind the region’s large and widening income gaps relative to developed economies and the emerging East Asian economies. Therefore, the book argues that the primary focus of policy discussion should be to better understand the causes of productivity problems in the region and to take necessary measures to urgently and effectively address the productivity challenges.

This review article first summarizes the main findings of the volume. It then provides an assessment, and finally explores the policy lessons of the research findings for Canada.

The contributors to the volume define the term “productivity” as total factor productivity or TFP, not labour productivity. TFP measures the efficiency with which both capital and labour inputs are used in the production process. At the economy level, TFP growth is a weighted sum of labour productivity growth and capital productivity growth, where output is defined as value added and the weights are income shares. At the industry and firm level, TFP ideally needs to be based on gross output rather than value added. TFP measures based on gross output, therefore, take into account the productivity of intermediate goods, as well as capital and labour.

In the short-term, TFP growth is influenced more by cyclical factors such as the capacity utilization than the fundamental drivers of trend or long-term productivity growth. Over the longer-term, TFP growth at the economy level is mainly determined by four key factors: improvements in product and process innovation; adoption and diffusion of new technologies; improvements in the allocation of resources across establishments, firms and industries; and scale and scope economies.

**The Magnitude of the Region’s Productivity Challenge**

In 1960, average income per capita in Latin America and the Caribbean was one-quarter of the U.S. level. In 2005, it was just one-fifth (Chart 1). On the other hand, several East Asian countries, which in 1960 had incomes levels much below those in Latin America and the Caribbean, are fast approaching or have

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2 The 18 Latin American and Caribbean countries included in the volume are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.
joined the ranks of high-income nations. Large and widening TFP gaps are the main reason behind the low income level and slower growth in income per capita in the region. The volume estimates that TFP in Latin America and the Caribbean is about half of the U.S. level (Chart 1). The U.S. level represents a proxy for the region’s potential productivity level. Nevertheless, there is substantial variation in productivity and income levels across countries in the region. For instance, in 2005, the TFP level varied from a high of 75 per cent of the U.S. level in Chile to a low of 30 per cent in Honduras (Chart 1).

Taking into account the interplay between the accumulation of factors of production—capital and labour—and TFP, the research estimates that the region’s per-capita income gap with the United States would largely disappear if the TFP gap were to close. This is because higher TFP not only represents a more efficient use of physical and human capital, but also results in faster accumulation of these two key factors of production in response to the increased returns prompted by the TFP boost.

### Nature of the Productivity Problem

#### The Service Sector: Achilles Heel of Latin American Productivity Performance

It is very interesting as well as surprising to learn that the share of total employment provided by the industrial sector in Latin America is now lower than in both East Asia and the developed world. Moreover, productivity in agriculture, forestry, and mining, all intensive users of natural resources, has performed very well in Latin America compared to other industries in the region and compared to its counterparts in East Asia and the developed countries. The region has a comparative advantage in these sectors because of its rich natural resources endowment. Labour productivity in these sectors advanced 3.5 per cent per year during 1990-2005. Similarly, labour productivity growth was respectable in manufacturing, although its productivity performance has significantly lagged behind its counterparts in the United States and East Asia.

On the other hand, the region’s labour productivity growth in the service sector fell sharply during the 1980s and has remained stagnant for the last 15 years. In contrast, in East Asia, service sector labour productivity growth averaged 2.5 per cent per year and in high-income countries it grew by 1.4 per cent per annum during the last 15 years. Therefore, to close the large and widening aggregate productivity gap, the region must boost the productivity of its non-tradable (service) sector. For example, raising manufacturing productivity growth to the rate enjoyed in East Asia would hardly make any difference for the aggregate productivity growth of the region, because of the sector’s small and declining importance. On the other hand, the region’s overall productivity growth would double if productivity growth rates in its service sectors were to match the productivity growth of their counterparts in East Asia.

#### Large Presence of Small Firms

The volume identifies dramatic differences in productivity levels across enterprises and establishments in Latin America and the Caribbean, even within narrowly defined industries. For instance, in Colombia, the difference in productivity levels between the 90th and 10th percentile manufacturing firms in 1998 was over 250 per cent, more than double that in the United States (Chart 2).

Across all countries, the least productive companies tend to be the smallest ones. Throughout the region, size and productivity level are highly positively correlated. Compared to manufactur-
ing firms employing 10-19 production workers, manufacturing firms in the 20-49 range are about 50 per cent more productive, and productivity doubles in firms with more than 100 production workers.

Small companies, especially with less than 10 employees, account for a significant part of the economy, much more so than in high-income countries. For example, firms with less than 10 employees in Mexico accounted for over 90 per cent of manufacturing firms and 23 per cent of manufacturing employment in 2004, while their output share was 4 per cent. On the other hand, there is a shortage of medium and high-productivity firms in the region.

It is estimated that reducing the share of small manufacturing firms and increasing the share of medium-sized manufacturing firms to match the size distribution of firms in the United States, leaving the productivity of all firms unchanged, would almost close the manufacturing productivity gap with the United States.

The small firm size problem is more acute in the service sector where most of the region’s economic activity is concentrated. It is estimated that reallocating resources across enterprises within service industries alone would raise aggregate productivity in the region by 50-60 per cent. Moreover, the gains in TFP brought about by better allocation of resources would likely increase investments in physical and human capital and innovation. As a result, the overall positive impact of an improvement in resource allocation on aggregate productivity and real income would be larger than those only measured by static gains in overall efficiency.

The volume argues that extensive resource misallocation of resources within industries is a symptom of lack of competition for resources. Government policies, market failures, and location advantages enjoyed by less productive firms seem to be the main drivers of resource allocation across companies and establishments within a given industry in the region, rather than relative efficiency.

### Main Causes of the Productivity Deficit

#### High Trade Costs

The volume argues that the relationship between trade and productivity in Latin America and the Caribbean is more complex and far-reaching than indicated by previous research. Trade costs, defined to include tariffs as well as transport costs, have a negative effect on aggregate productivity via their adverse impact on the productivity of individual firms and their negative impact on resource allocation across firms within industries. Transport costs represent the most important component of trade costs in most countries in the region. Tariffs have been reduced considerably in the last few decades in Latin America. Hence, further reductions in tariffs alone will not give a significant boost to the region’s trade and productivity.
Most Latin American countries have higher freight rates than in the United States, Europe and East Asia. For example, in 2006, the share of freight costs in total imports in Latin America was 6.6 per cent, almost double the share in the United States. To maximize productivity benefits from trade, reductions in transport costs need to be complemented by stronger import competition, increased export opportunities, and a faster and more efficient re-allocation of resources among firms within and across industries. Reducing the negative impact of customs procedures and technical regulations on trade flows would also help to stimulate aggregate productivity.

The authors’ research indicates that inadequate infrastructure, ineffective regulations, lack of competition among service providers, and inefficient cargo transport, caused by deficient operating procedures and information systems, all contribute to high transport costs in Latin America.

A Large Credit Gap

Availability of sufficient credit to efficient firms as well as firms with high growth potential would raise aggregate productivity by boosting individual firm productivity as well as by allocating resources more efficiently among firms. Without sufficient credit, productive firms cannot expand and less-productive firms cannot make the necessary investments in new technologies and innovation that are needed to increase their productivity. The credit deficit has another damaging effect on resource allocation and productivity by weakening the incentives for informal firms to comply with tax, legal and social security provisions. This hurts productivity by allowing less productive firms to survive because of lower overall costs than they otherwise would have. Therefore, expansion of credit to firms with high growth potential would make a significant contribution to aggregate productivity by correcting potential misallocation of resources among firms. The research done for the volume shows a strong correlation between TFP growth and improvements in credit availability.

The volume argues that the underdevelopment of the credit market is a serious problem in Latin America and the Caribbean. Over the period 1965-2003, the ratio of private sector credit to GDP in Latin America averaged 31 per cent, less than half that in East Asia. This ratio exhibits a declining trend in Latin America, beginning in the early 1980s.

A Complex and Ineffective Tax System

According to the volume, the tax system in the region is extremely complex, segmented, and ineffective. Effective corporate tax rates in Latin America are relatively high. As a per cent of profits they averaged 48 per cent in 2007, compared to 31 per cent in high-income countries and 40 per cent in East Asia. However, the large difference in the corporate tax burden between Latin America and the high-income countries is mainly due to the large gap in transaction costs. The research shows that it takes on average of 320 hours per year for Latin American and Caribbean firms to file taxes compared to an average of 177 hours in high-income countries.

The research also suggests that the high corporate tax burden discourages productivity enhancing investments in new technologies, innovation, and skills development and the expansion of markets. The inefficient tax system is also contributing significantly to the region’s productivity problems by encouraging the survival of less productive firms, retarding the growth of firms of all sizes and fostering an unequal and segmented business universe.
Unintended Productivity Consequences of SME Support Programs

As discussed earlier, Latin America has many small firms, and many of them suffer from low productivity levels. Latin American countries, like their counterparts in other regions, have invested a great deal in policies to support micro-, small, and medium-sized enterprises (SMEs). SME financial support programs include providing credit at low interest rates on longer terms, and with less stringent requirements than demanded by the market. Other financial programs facilitate access to credit and provide grants or tax incentives targeted at specific activities such as employee training, innovation and exports. Newer types of SME support policies are aimed at facilitating linkages with larger and more productive firms.

For SME support programs to make a positive contribution to aggregate productivity, they need to raise the productivity of enterprises in excess of the cost of the programs, or raise the TFP of other enterprises at whose expense the SMEs obtained additional labour and capital. Research done for the volume suggests that the numerous SME support programs might have actually negatively affected the region’s productivity via their adverse impact on resource allocation both across firms and within industries. Many of the small firms in the region are actually too large relative to what they should be because of implicit subsidies they receive in the form of grants, and unpaid taxes and social security contributions.

A Large Innovation Deficit

Innovation—acquisition, adaption and creation of new knowledge—is the fundamental determinant of longer-term productivity growth. The research done for the volume identifies a large innovation deficit in Latin America and the Caribbean. R&D is commonly associated with the generation of new products and services, which are essential for improving and sustaining productivity and competitiveness of firms. R&D is also crucial for the acquisition and adoption of existing new knowledge and technologies.

Despite some recent progress, mostly concentrated in the larger Latin American economies, a serious deficit of R&D investment and innovation exists in the region. Latin American firms, on average, spend less than 0.2 per cent of their GDP on R&D compared to 1.6 per cent in Europe and 1.9 per cent in OECD countries (Chart 3). A large business R&D deficit exists in the region even after correcting for the differences in industrial structure. Furthermore, much of the R&D dollars are used for assimilating the technology in new machinery and equipment, while OECD countries use R&D for developing new products and processes. Another feature of innovation in Latin America

Adverse Impact of Social Policies on Productivity

Social policies are generally intended to provide direct assistance to individuals to raise their living standards. Many social policies influence behaviour in labour markets. The design of the policies, notably the targeting mechanism and eligibility criteria, largely influences the magnitude of changes in labour market behavior. The research suggests that although many of the social policies in the region are well-intended and justifiable from an equity perspective, they may have adversely affected the region’s overall productivity performance by aggravating the misallocation of resources among firms through their unintended consequences in labour markets. Simulation results in the volume done for 12 countries in the region indicate that output losses from the unintended consequences of social policies in labour markets vary between 0.4 per cent and 5.2 per cent of GDP.
is the high concentration of R&D spending in a small number of firms. For instance, in Argentina, one firm accounts for one-third of the entire manufacturing sector’s R&D. But, the total R&D intensity of the region is three times that of its business R&D intensity, implying that the R&D effort of its governments and universities is comparable to that of OECD countries.

The research indicates that there is a widespread failure to link the region’s R&D capacity with local business activity, a critical ingredient for maximizing the returns from R&D spending. This could be the result of the co-existence of a very low business R&D intensity and a fairly adequate R&D effort by the non-business sector.

Lack of finance, long return periods, small domestic markets, shortage of trained personnel, and lack of an effective intellectual property regime seem to be the main obstacles for undertaking innovation by Latin American companies.

Policy Prescriptions

Overall productivity in a country is the outcome of the complex interaction of activities by millions of enterprises and individuals, and government policies and programs. Improving productivity requires investments in innovation, employee training, and new technologies as well as adapting quickly and effectively to changing internal and external environment, efficient allocation of factors of production, and effective use of land, labour and capital. Therefore, government policies and programs need to encourage, support, and facilitate these productive investments and activities by all enterprises.

The volume makes a number of useful policy recommendations to address the productivity challenges of the region. The following are some of the key suggestions, grouped by policy area.

In terms of overarching principles, the volume recommends that

- Productivity be made the central focus of public debate and policy discussion, and that
- Direct and indirect effect of policies on trend productivity be evaluated and disseminated widely.

Related to SMEs, the volume recommends

- Do not support the weakest and unproductive small enterprises simply because they are small; and
- Evaluate the productivity impacts of all SME support programs;
- Do not give permanent or long-term support to SMEs; and
- Concentrate on the SMEs with the greatest possibility of success;

Related to tax policy, its recommendations include
• Simplify the tax regime on production and profits of all firms;
• Broaden the tax-base to include microenterprises and the self-employed;
• Do not create special tax regimes based on sector or firm size; and
• Delink social security funding from employment;

Related to innovation policy, the volume recommends
• Link research to business activity;
• Strengthen intellectual property rights;
• Use competitive mechanisms for allocating resources to universities, professional and technical education and technology centers, and evaluate results;
• Improve cooperation and coordination between various actors in the innovation system;
• Encourage and support development of sectors with positive externalities and a capacity to pull other sectors up; and
• Do not support failed projects or enterprises.

An Assessment

This volume contains 12 well-thought out, well-researched, and closely related papers on various aspects of the productivity challenges facing Latin America and the Caribbean. It provides an excellent and penetrating analysis of the magnitude of the productivity challenges for the region and examines several important micro and macro sources of the large and widening productivity gap between the region and the developed world and East Asian economies. In my view the volume makes a major contribution to productivity research in general and to the policy development work to improve productivity in Latin America specifically.

I appreciate the book’s focus on TFP levels and growth for shedding light on the sources of the large and widening per capita real income gaps in Latin America and the Caribbean. However, at the economy level, per capita income, the standard proxy for living standards, is much more directly related to labour productivity than TFP. Growth in per capita real income at the economy level is determined by growth in labour productivity, the employment rate and the share of the working age population in the total population. Labour productivity in turn is the result of growth in TFP and increases in the capital-labour ratio. Therefore, it would have been useful for the volume to also provide data on trends in labour productivity and capital intensity for all the countries in the region.

The book argues that closing the region’s TFP gap would more or less eliminate the per capita income gap. I agree that an increase in region’s TFP growth would have a substantial positive impact on real income growth by directly raising labour productivity and indirectly by stimulating the accumulation of physical and human capital. But, in my view, the authors overestimate the increase in capital accumulation from TFP improvements.

But, as noted already, there is a great deal of variation in TFP levels and GDP per capita across Latin American countries, and the real income gaps vis-à-vis the United States are considerably larger than the TFP gaps. This suggests that closing the TFP gaps alone might not eliminate the real income gaps in the region. For instance, Chile’s TFP gap with the United States is only about 25 per cent while its GDP per capita gap is over 60 per cent! Clearly, other factors such as differences in capital intensity, the employment rate and the share of the working-age population in the total population also play an important role.

Another point is that there may be a two-way causal relationship between capital accumulation and TFP. For instance, research done for Industry Canada indicates a positive impact of increased investments in M&E capital and
human capital (education level) on TFP (Rao, Tang, and Wang, 2008).

The major contribution of the volume is its research and policy focus on firm dynamics and creative destruction. It identifies the misallocation of resources among firms within industries as major source of the large and widening TFP and real income gaps. Therefore, government policies and programs that encourage and facilitate the creative destruction process would contribute greatly to closing the income and TFP gaps in the region. What is creative destruction? It entails exit or death of low productivity firms, birth or entrance of high productivity firms, and the shift of resources from low productivity firms to high productivity continuing firms within industries. An article published in the last issue of this journal suggests that Finland’s robust productivity growth since the mid-1980s is due to an intensification of the creative destruction process (Maliranta et al. 2010). Creative destruction also has contributed significantly to labour productivity growth in the Canadian manufacturing and retail trade sectors (Baldwin and Gu, 2006 and 2011).

Aggregate productivity is also affected by the allocation of resources among industries. Therefore, differences in productivity levels within and across regions would also be influenced by differences in industrial structure. Similarly, differences in the shift of resources both between and within industries could partly explain differences in productivity growth rates across countries. The volume seems to recognize these two important dimensions. But, it does not quantify their contributions to the large and widening aggregate productivity gaps in the region.

The detailed analysis contained in the volume on the major factors behind the region’s serious productivity problems was enlightening. But to develop an effective policy menu, policy makers need to know the relative importance of various sources of the problem. It would have been useful if the volume had tried to quantify the contribution of key factors to the region’s large TFP gap and widening over time.

Insights for Canada

Many of the research findings and policy prescriptions in the volume are relevant to Canada, because both the size and the nature of Canada’s productivity challenges are similar to those of Latin America, although lesser in magnitude.

Canada too has a large productivity gap vis-à-vis the United States, its largest trading partner. Currently, Canada’s business sector labour productivity is only 70 per cent of the U.S. level (Chart 4). Like Latin America, Canadian research indicates that the TFP explains over 85 per cent of the Canada-U.S. business sector labour productivity gap (Rao and Tang, 2008 and Tang, Rao and Li, 2010). The productivity gap problems are generally broad-based across Canadian industries. However, since much of the economic activity in Canada is also concen-
trated in service industries, closing the business sector TFP and labour productivity gaps requires closing the productivity gaps in these industries.

Furthermore, Canada also experienced slower growth in business sector labour productivity than the United States since 1980, and the growth gap worsened significantly after 2000. Since 2000, Canada’s business sector labour productivity increased at just 0.7 per cent per year, compared to 2.6 per cent in the United States. The difference in TFP growth entirely explains the labour productivity growth gap between the two countries. However, the post-2000 productivity slowdown in Canada is much more acute in goods producing industries, especially mining and manufacturing, than in service industries (Baldwin and Gu, 2009; Tang, Rao and Li, 2010; and Sharpe and Thomson, 2010).

If the Canada-U.S. TFP and labour productivity growth gaps experienced since 2000 were to continue to persist in the future, Canada’s business sector labour productivity would be only about 50 per cent of the U.S. level by 2021. Such an outcome would have serious adverse consequences for the accumulation of physical and human capital, innovation, the value of Canadian dollar, terms of trade and real incomes, and would create a vicious cycle of slower growth rates for productivity, real incomes, and low investments in innovation, M&E, and human capital in Canada.

One could argue that Canada’s productivity challenge, described above, is alarmist and exaggerated. This is because that despite a dismal business sector labour productivity growth since 2000, Canada did very well relative to other G7 countries, including the United States, in terms of growth in real GDP and increases in per capita real income. This apparent inconsistency between the very slow business sector productivity growth and Canada’s strong macro-economic performance can be easily explained. Superior employment growth and and strong gains in Canada’s terms of trade, resulting from the large increases in real commodity prices, more than offset the possible adverse impact of the slowdown in productivity growth on real GDP and real incomes in the post-2000 period.

However, Canada can not expect a similar boost to its economy in the future from employment growth and terms of trade improvements. The expected slowdown in working-age population linked to the ageing of Canada’s population will seriously constrain employment growth in the future. Similarly, we can not expect to enjoy continuous improvements in terms of trade. Therefore, the only way Canada could increase its real incomes is by raising its trend productivity growth.

Recent European productivity research provides some optimism about Canada’s future productivity growth (Timmer et al., 2011). It suggests a trade-off between employment growth and productivity growth, implying that the expected slowdown in employment growth would raise Canada’s trend labour productivity growth. This research is still fairly new and controversial. It is not clear through which channels a slowdown in employment growth would increase trend productivity growth, and vice-versa. At best, there could be a two-way causation between employment growth and productivity growth. Before we take seriously the optimistic predictions of this new research, a well-articulated model of the trade-off and a rigorous empirical testing are needed.¹

Like Latin America, SMEs in Canada are considerably less innovative and productive than large manufacturing firms. They lag in terms of investments in M&E spending, R&D, and worker training. Canada also has too many very

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¹ I am planning to discuss the trade-off and other productivity issues in a future study for the Institute for Research in Public Policy.
small firms and not enough medium-sized firms. Some research suggests that a significant part of the Canada-U.S. productivity gap in manufacturing is simply due to the differences in firm-size distribution in the two countries (Baldwin, Jarmin and Tang, 2004; Almon and Tang, 2010). Research also suggests that the issues related to firm-size structure might be more prevalent in Canadian service industries than in the manufacturing sector (Leung, Cesaire and Yaz, 2008). As mentioned before, Canadian research indicates that the creative destruction process has been responsible for a significant part of the manufacturing sector’s labour productivity growth. Nevertheless, more recent Industry Canada research finds much divergence in productivity levels across firms within narrowly defined manufacturing industries. Unfortunately, we do not know very much about the nature of firm dynamics and productivity dispersion in Canadian service industries. But, I suspect that the creative destruction process has also contributed significantly to the service sector productivity growth.

Canada also has a large business sector R&D-intensity gap with many OECD countries. As in Latin America, business R&D spending in Canada is concentrated in a few large firms, and much of it is used for the adoption and diffusion of new knowledge and technologies from outside Canada, rather than developing new products and processes. Like Latin America, it seems that Canada too has not fully exploited the potential productivity dividends from the considerable R&D effort of its governments and universities, perhaps because of weak linkages among all the important actors in the Canadian innovation system (Council of Canadian Academies, 2009; Nicholson, 2009; Currie, 2011).

Given that the size and nature of Canada’s productivity challenges are similar to those of Latin America, although of lesser magnitude, many of the policy suggestions contained in the volume could be valuable to Canada.

Canada also needs to make productivity the central focus of public debate and policy discussion. In addition, it also needs to consider evaluating and disseminating the productivity impacts (both direct and indirect) of all government policies and programs, especially new ones. Canadian policy makers could also examine the relevance and viability of all the other specific policy suggestions in the book, especially the ones with regard to SMEs, taxes, and innovation.

References


