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FACILITATION OF TRANSPORT AND TRADE IN LATIN AMERICA AND THE CARIBBEAN

# The economic infrastructure gap in Latin America and the Caribbean

## Introduction

Economic infrastructure refers to all the permanent engineering structures, equipment and physical facilities that are the basis for providing energy, transport, telecommunications, water and sanitation services to productive sectors and households. The efficient and timely provision of this infrastructure has a positive effect on economic and social growth, and there are interesting relationships between investment in infrastructure and improvements in social equity.<sup>1</sup>

The Economic Commission for Latin America and the Caribbean (ECLAC) has drawn the attention of regional authorities to the impact of insufficient infrastructure (in terms of quantity or quality) on the future development of Latin America and the Caribbean (LAC). This deficit, called the infrastructure gap, requires urgent measures to raise investment levels while strengthening and adapting the regulatory, organizational and institutional environment related to infrastructure services in order to favour inclusive, sustainable development.

Considering the importance of this issue for the region, this edition of the *FAL Bulletin* summarizes the main conclusions of a report soon to be published by the ECLAC Infrastructure Services Unit. Following an exhaustive review of the specialized literature, the report (based on estimated demand during 2006-2009) explains the investments needed to close the regional economic infrastructure gap and provides an initial cost estimate.

This edition of the *FAL Bulletin* analyzes the impact of economic infrastructure on development in Latin America and the Caribbean and looks at future investment needs for 2006-2020.

It reviews the specialized literature and updates the statistical information available on public and private investment in developing economic infrastructure in some countries in the region.

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Introduction



I. The importance of infrastructure in economic development



II. Recent trends in infrastructure investment



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<sup>1</sup> Calderón and Servén (2004) show the positive impact of the provision of infrastructure on the Gini coefficient. Ferro and Lentini (2008) analyze the "social impact of infrastructure for sanitation and transporting people." *FAL Bulletin* No. 268, Santiago, Chile.

## I. The importance of infrastructure in economic development

Infrastructure and the services that it is used to provide have a significant impact on national economies and the quality of life of a country's inhabitants (Rozas and Sánchez, 2004). Economic infrastructure services are critical for achieving the Millennium Development Goals (MDG). They enable access to productive centers at a lower economic and social cost, and they improve the connectivity and mobility that the entire population (especially the poorest and those living in rural areas) needs in order to gain access to basic education and health care services, thus favouring sustainable economic and social development (Pérez Salas, 2009).

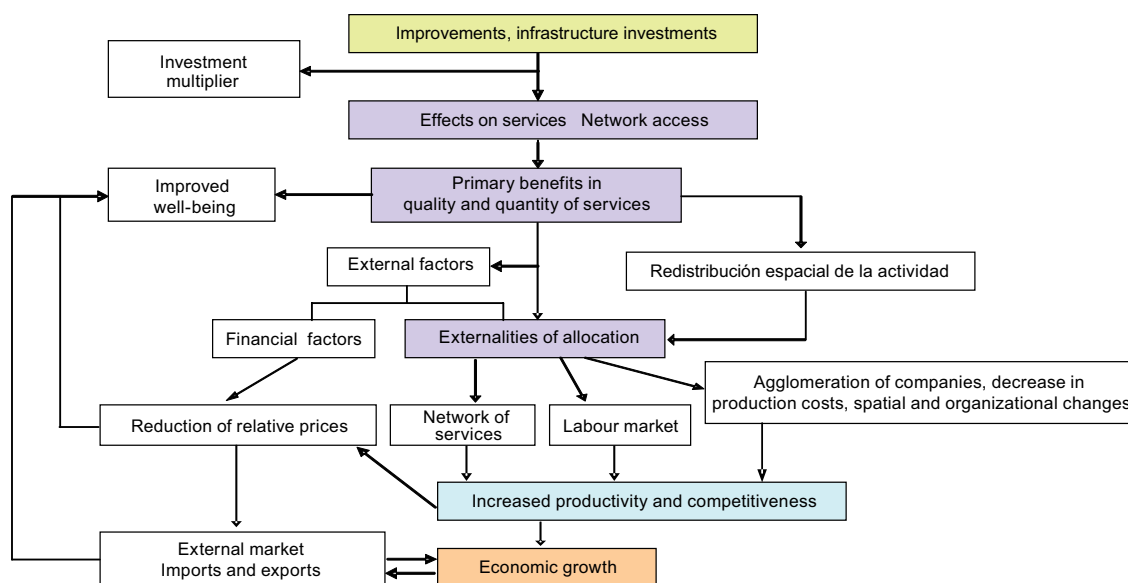
As the world economy grows and production becomes increasingly global, basic infrastructure must be expanded and upgraded in order to meet international technological standards and broaden coverage within national territories so as to effectively meet productive needs and those of the population (Cipoletta et al., 2010).

David Aschauer's ground-breaking article (1989) showed how infrastructure affects total factor productivity, while Calderón and Servén (2002) quantified its impact on the

countries of Latin America and the Caribbean. According to Rozas and Sánchez (2004), "with adequate infrastructure and efficient related services, countries can compensate for the lack of certain natural resources." Other advantages of infrastructure development, the authors continue, are a greater degree of productive specialization, generating economies of scale and agglomeration; integration of the economic and territorial system of a country or region; reduction of costs associated with the consumption of services; better access to markets for goods and inputs; improved coverage and quality of services provided to the population; and increased social well-being.

The standard impulse-propagation mechanism of the positive effects of infrastructure is described in Rozas (2008): "improving infrastructure services, measured in terms of telecommunications, road network and transport services, energy generation, transmission and distribution and the supply of potable water and sanitation, and making them more widely available, increases factor productivity and lowers production costs for producers. The increased profitability encourages investment and therefore increases potential GDP growth." Increased growth in turn increases the population's income, creating favourable second-round effects on the economy, as the following diagram shows:

Diagram 1  
INFRASTRUCTURE DEVELOPMENT AND ECONOMIC GROWTH



Source: Rozas, P. and Sánchez R. (2004), "Desarrollo de infraestructura y crecimiento económico: revisión conceptual", Natural Resources and Infrastructure Series, ECLAC.

Infrastructure and its related services act as vehicles for territorial, economic and social cohesion by integrating and uniting the territory, making it accessible from the exterior and allowing inhabitants to connect with their surroundings (Correa and Rozas 2006). They also improve income distribution and help reduce poverty in the region (Calderón and Servén, 2002). According to ECLAC (2010a), “infrastructure facilitates social development, especially when it is included in connectivity and social inclusion policies aimed at the most socially and economically underprivileged regions, while at the same time helping to reduce distributional imbalances.”

Maintaining appropriate levels of investment in economic infrastructure over time is therefore a socially desirable objective that contributes to good economic performance and helps improve living conditions in the region. The lack of sufficient national infrastructure can “seriously hamper growth or make it difficult to maintain a position in international markets if the supply of infrastructure services falls short of what is needed to support the expansion of other sectors of the economy and ensure that the system is competitive enough” (Rozas 2008).

In this regard, Rozas and Sánchez (2004) warn that “the high costs of infrastructure services in developing countries negatively affect their insertion in international trade. It has been estimated that the impact is similar to that of customs duties and barriers or exchange rate distortions.” Additionally, “the high costs of transport, telecommunications, electricity and sanitation services, among other infrastructure services, as well as their quality, negatively affect factor productivity and business and export competitiveness” (Rozas 2008). So, “the absence of adequate infrastructure, as well as inefficient services, represent large obstacles to the effective implementation of public policies, the full achievement of economic and social development goals and the fulfillment of integration objectives” (Cipoletta et al 2010).

A recent ECLAC study (ECLAC 2010a) identified the main challenges that the region faces with respect to infrastructure services:

- Many separate public visions regarding infrastructure and services and the resulting lack of a comprehensive approach to policies throughout the cycle (conception, design, implementation and follow-up, auditing and evaluation).
- Physical limitations, or scarce infrastructure and services.
- Institutional and regulatory obstacles or failures in both policy management and market organization.

- Weak and/or unsustainable criteria when designing infrastructure service policies, especially in transport.
- Finally, issues such as problems in facilitating transport and trade (which are related to technical regulations and the bureaucratization of trade processes, among other aspects), as well as access to funding, the quality and performance of public-private partnerships, regulatory institutions and accounting, and how infrastructure markets operate and mature, must also be examined in order to maximize the contribution of infrastructure services to development and integration.

This report focuses on physical limitations. Nevertheless, as stated in the previous paragraph, the gap is not only physical. It is also worsened by problems related to how the processes are facilitated and coordinated.

## II. Recent trends in infrastructure investment

Investment in economic infrastructure has declined significantly throughout most of the last three decades, falling from almost 4% of gross domestic product (GDP) in 1980-1985 to 2% between 2007 and 2008.

Table 1  
INVESTMENT IN INFRASTRUCTURE AS % OF GDP,  
SELECTED COUNTRIES

Sector	1980-1985	1996-2001	2002-2006	2007-2008
Public	3.1	0.8	0.6	0.7
Private	0.6	1.4	0.9	1.3
Total	3.7	2.2	1.5	2.0

Source: The authors, with their own data and data from Calderón and Servén (2004) and Rozas (2008).

Although as a whole there was a substantial drop in infrastructure investment in terms of GDP, a breakdown by sectors (public and private) reveals that each one behaved differently during the subject period.

### A. Public investment

Public investment fluctuated over the three decades. In the early 1980s, governments maintained high levels of infrastructure investment (around 3% of GDP –the highest amount in the period studied). This happened despite fiscal constraints, difficulties in accessing external financing and spiralling inflation.

During the 1990s the new role of the market and the resulting change in the role of the State led to a general contraction of public investment. Infrastructure investments were especially affected and came to account for 0.8% of GDP by the second half of the

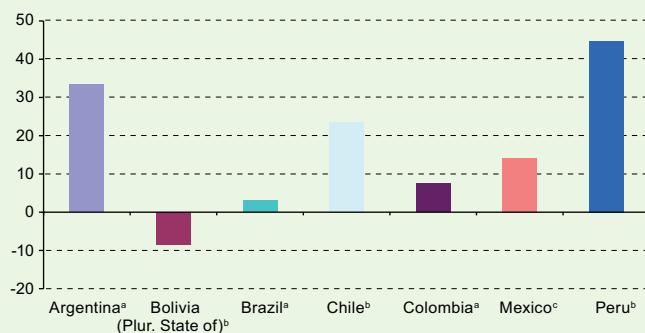


decade (Calderón and Servén 2004). It was during this period that much of the privatization of state companies took place and the corresponding regulatory frameworks were created and/or modified.

The downward trend continued in the first years of the new century, and infrastructure investment hit 0.6% of GDP (Rozas 2008). The trend reversed slightly during the most recent period for which data are available (2007-2008). Among the reasons for this increase are sounder public accounts that, together with a lower, improved debt profile and rising international reserves, gave several countries in the region more public policy space (ECLAC 2010a).

The international economic crisis of 2009 gave the region's governments the opportunity to promote active fiscal policies and greater monetary and exchange rate liquidity while implementing social and labour containment programmes. Fiscal measures included reducing taxes, increasing subsidies and tax benefits and increasing or speeding up public spending, as well as measures targeting certain sectors of the economy. Several of the countries that announced spending increases also announced infrastructure investment as part of their measures (ECLAC 2010c).

Figure 1  
CAPITAL EXPENDITURE  
(Annual % variation 2009 vs. 2008)



Source: ECLAC – Statistics and Economic Projections Division.

<sup>a</sup> Central Government.

<sup>b</sup> General Government.

<sup>c</sup> Non-financial Public Sector.

As a result, public capital expenditures increased in comparison with 2008 at the highest available level of aggregation.<sup>2</sup>

## B. Private investment

Although the first significant push for private investment in infrastructure was in the late 1980s, the sector played a leading role in the 1990s, primarily due to privatizations and other corporate take-overs. As a result, private investment reached 1.4% of GDP between 1996 and 2001—much higher than the 0.6% of GDP recorded in the early 1990s.

Investment also brought significant benefits. According to Rozas (2008), “although the opening of the infrastructure service markets and the sale of State-owned enterprises did not contribute much to gross capital formation in the sector, it did allow for the entry of foreign companies, which in many cases brought new production techniques, technologies and business organization systems that were instrumental in modernizing infrastructure and locally produced services.”

Consequently, despite its positive impact, the amount of private investment was not enough to offset shrinkage in the public sector in most areas. Nevertheless, private investment was a significant factor in telecommunications, and, to a lesser extent, in energy (Rozas 2008).

Between 2002 and 2006, private investment dropped off sharply in comparison with the previous period, falling to 0.9% of GDP. This trend partially reversed in recent years; the data for 2007 and 2008 show private investment rising to 1.3% of GDP and a much larger share of total private investment in infrastructure going to transport.

Since late 2008, the United States housing market crisis and its global ripple effect changed perceived risk on the part of private agents. This drove foreign direct investment down and decreased net transfers from abroad in several of the LAC countries<sup>3</sup> in 2009.

This would lead one to believe that private investment in infrastructure might be somewhat sensitive to the international crisis and would therefore account for a lower share of GDP than in 2007 and 2008.<sup>4</sup>

Total infrastructure investment for 2009 would then be the combined result of two opposing trends: rising capital expenditure in the public sector (driven by countercyclical policies), and falling private sector spending (out of caution born of less activity and greater risk aversion).<sup>5</sup>

<sup>2</sup> The Plurinational State of Bolivia was the only exception out of all the analyzed countries.

<sup>3</sup> The primary exception being Brazil.

<sup>4</sup> Assuming that the reduction in private investment is greater than the reduction in level of activity.

<sup>5</sup> An additional factor to consider is that the downturn in economic activity recorded

### C. The infrastructure gap in Latin America and the Caribbean

In general terms, the infrastructure gap is both horizontal and vertical.

#### Vertical gap

A vertical gap has to do with internal factors in the country or region being studied, when the domestic supply of and demand for infrastructure trend differently (i.e., do the stock of and investment in infrastructure match the demand generated by economic activity?).

From this perspective, and using the methodology proposed by Fay and Yepes (2003) for estimating the demand for infrastructure services needed to respond to economic growth, the estimate included the following sectors: electricity, telecommunications (fixed and mobile telephony and fixed broadband Internet access), surface transport (paved roads and railways) and water and sanitation.

The countries included in the study were Argentina, Barbados, Belize, Bolivia, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, Trinidad and Tobago and Uruguay.

The findings show that the region would need to spend, on average, around 5.2% of GDP yearly in order to maintain the infrastructure investment flows required to meet the needs of companies and end users during 2006-2020. These results assume 3.9% growth of regional GDP and 1% population growth.

#### Horizontal gap

A horizontal gap refers to a certain objective. Examples of this are the gap in comparison with other countries (i.e., the current level of infrastructure stock in LAC with respect to the level in a certain country or group of countries); the gap with respect to a certain level of coverage (i.e., universal basic funding for water and sanitation, or achievement of the Millennium Development Goals).

To gauge the horizontal infrastructure gap in Latin America and the Caribbean, the differences in per capita infrastructure stock indicators for 2005 between the countries of the region and the East Asian countries of Korea, Malaysia, Singapore and the Special Administrative Region of Hong Kong were quantified.

These countries were chosen as a benchmark for LAC because they are examples of rapid growth and development in a relatively short period of time, with the State playing an active role in attracting private investment, referred to in the literature as “market friendly” policies. The role of capital accumulation (both physical and human) in the growth of these territories has been widely documented.<sup>6</sup>

According to this estimate, LAC would need to spend 7.9% of GDP annually (again, assuming 3.9% average annual GDP growth) between 2006 and 2020 in order to attain the levels of per capita infrastructure stock of the selected East Asian countries by 2020.

### D. Financing the gap

Investing enough to close the gap requires significant effort from all the economic agents. From the public-sector perspective, the region’s fiscal accounts have improved significantly in recent years thanks to, among other factors, economic growth during 2003-2008, increased consumption and increased tax collections as the economy grew. Improvements in the terms of trade resulting from the surge in demand for commodities such as metals and minerals, petroleum and certain grains (soy bean, for example) from the Asian countries (especially China and India) have also strongly favoured some economies in the region. As a result, and in contrast to historical trends in the region, a large number of the countries had primary surpluses and lower debt levels.<sup>7</sup>

Table 2  
FISCAL BALANCE AND PUBLIC INVESTMENT IN  
INFRASTRUCTURE, NON-FINANCIAL PUBLIC  
SECTOR 2005-2008 AVERAGES  
(Figures in % of GDP)

Country	Primary balance	Overall balance	Investment in infrastructure
Argentina	3.2	0.9	1.3
Bolivia (Plurinational State of)	3.5	1.8	4.1
Brazil	3.8	-2.6	0.6
Chile	9.7	8.7	1.3
Colombia	3.0	-0.5	0.7
Mexico	1.9	0.0	0.7
Peru	3.5	1.7	1.0

Source: The authors, based on ECLAC data.

Note: Weighted average by relative share of GDP for 2005-2008.

<sup>6</sup> An important reference can be found in World Bank (1993).

<sup>7</sup> The information available for 2009 shows reversals for some countries (for example, Costa Rica, Ecuador, Mexico, Nicaragua and Peru), with primary deficits after several years of surplus. It must be noted here how atypical the year in question was (international crisis), and that the public accounts also reflect the battery of countercyclical policies deployed.

<sup>8</sup> In many LAC countries in 2009 implies that where public or private investment was similar to that of 2008, that investment rose as a proportion of GDP.

This shift in the historical trend in LAC offers the public sector the possibility of more fiscal space for economic and social infrastructure projects. In this regard, Lucioni (2009) discusses four priorities that budgetary policies should include in order to consolidate this good performance and promote public investment in infrastructure.

- The first deals with reducing risks related to financial restrictions and public debt. The aim here is to create more fiscal space, allowing an increase in capital expenditures. According to Lucioni, “current account equilibrium or surplus should still be an objective, and it should be the guiding principle when setting fiscal goals.”
- The second priority is related to the long-term sustainability of debt. If any doubts remain as to this, the author mentions that even public investment with a significant impact on economic growth can be unsustainable.
- Thirdly, the project selection process and requirements are important. Here the author says that “it is necessary to look for quality projects that can provide tangible results that are economically, environmentally and socially sustainable. These projects involve large investments that supersede other alternatives and commit public and private resources for several years.” It is also important that the technical capacity of the public sector meet the requirements of initial planning, preparation and evaluation.
- Finally, private-capital infrastructure projects in which the public sector must take on part of the private risk generate potential public-sector liabilities that must be taken into consideration. Lucioni says that “these contingencies must be reflected in fiscal and public debt projections as they could be more costly than traditional public financing.”

## E. Conclusions

In recent years, investment in economic infrastructure and related services in LAC has been insufficient. Although several factors were involved (such as high macroeconomic volatility, the lack of comprehensive policies and regulatory and financing issues), the effects of these physical constraints are obvious and seriously threaten future development.

The main objective of this study has been to measure the infrastructure gap and the investments needed to close both the horizontal and the vertical gap. Latin America and the Caribbean will have to invest around 5.2% of the region's GDP annually in order to meet the needs of companies and individuals between 2006 and 2020,

assuming average annual economic growth of 3.9% during this period. If, however, the intention were to close the gap with a group of East Asian countries, expenditures would have to rise to 7.9% of annual GDP.

In both cases, these amounts should be regarded as a minimum effective threshold because the information available restricted the analyses to just a part of the total economic infrastructure. Furthermore, for the same reasons, only spending in investment and maintenance has been considered; expenditures in rehabilitating and upgrading the existing stock have been excluded.

In conclusion, simply making the estimated investments required does not guarantee that they will lead to growth. Rather, as Rozas and Sánchez (2004) state, “investment in infrastructure is necessary for development, but it is not enough on its own. Instead, the impact of infrastructure investment on growth will also depend on other factors, such as the extent of human capital development, the availability of natural resources and access to funding and technology.” The way in which all of these issues are dealt with will be a key determinant of how LAC is positioned in the twenty-first century, both with respect to the global economy and in terms of the quality of life of its inhabitants.

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