

The Transport and Trade Infrastructure Growth Gap in Latin America

This edition of the FAL Bulletin addresses the topic of transport infrastructure growth and its relationship to trade in Latin America. This study, examining the cases of four Latin American countries, forms part of a more extensive document that will be published soon. The authors are Romina Gayá and Rosario Campos.. For further information, please contact trans@eclac.org

I. Introduction

The development of transport infrastructure is positively correlated to economic growth. Greater availability and quality of infrastructure services help increase the productivity of factors and reduce the costs of production, making firms more competitive and encouraging investment and economic growth, which in turn lead to increased demand for infrastructure services, completing the virtuous circle. The quality and efficiency of transport infrastructure directly impact the costs of logistics in general, and of transport in particular, which has a significant bearing on the competitiveness of companies, and, consequently, on their decisions regarding location, investment and production.

Developing transport infrastructure also reduces the economic distance between productive centres and their destination markets –at both the national and international level– thus influencing the spatial distribution of national economic activity and the way international trade flows are structured.

In Latin America, transport infrastructure, like other infrastructure sectors, has significant shortcomings. If the region is compared to other emerging economies, it is further evident that this lag is qualitative as well as quantitative. One of the reasons behind this lag is that total transport investment in the region has dropped to half its levels over the past two decades, and in terms of gross domestic product (GDP), it is one third what it was in the mid-1980s. By comparison, the Asian countries increased their infrastructure investment during the same period. Insufficient investment in infrastructure –as well as in the operation of services– could seriously affect Latin America’s development by limiting the possibilities for economic expansion over time, which would prevent the benefits derived from economies of scale and specialization at the subnational, national and regional levels. In this context, the objective of this study is to detect potential transport infrastructure saturation risks in Latin America that could restrict the expansion of production and trade and, consequently, the region’s future development.

II. Methodological aspects

This report, a longer version of which will be published soon, aims to estimate the evolution of the transport infrastructure gap in Latin America between 1995 and 2010. Infrastructure gap should be understood as the difference that exists between the evolution of the infrastructure supply and the evolution of the demand. It is important to clarify that this difference does not necessarily imply the existence of an infrastructure deficit, as will be discussed later.

In preparing for this study, the authors examined different methodologies for modelling infrastructure provision and trade growth in order to detect transport infrastructure saturation points that could restrict trade expansion in Latin America in general.

The countries used as the basis for estimating the region’s gap were Argentina, Brazil, Chile and Mexico, since together they represent 81.8% of trade with the Asia-Pacific region between 1994 and 2006.¹

¹ Between 1994 and 2006, these countries represented 83.7% of exports and 80.8% of imports for Latin America (Argentina, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Plurinational State of Bolivia, Uruguay), vis-à-vis Asia-Pacific (Brunei Darussalam, China, the Republic of Korea, the Philippines, Hong Kong SAR, Indonesia, Japan, Malaysia, the Russian Federation, Singapore, Thailand and Viet Nam). Source: the authors, using ECLAC–BADECEL data.

The information sources used were databases maintained by the Economic Commission for Latin America and the Caribbean (ECLAC) (national accounts, trade) and the International Monetary Fund (IMF) (country growth projections), official national sources and some estimates of infrastructure stock for each country.

In order to calculate the evolution of the transport infrastructure gap, estimates of the effective infrastructure stock (supply) and necessary infrastructure stock (demand) were used.

III. Estimating the stock of “effective” transport infrastructure

The “effective” transport stock is the capital transport stock or transport material available in a country, measured in base-year constant prices. In this report, “effective” stock is used as a synonym for the transport infrastructure supply of a country or region.

The model used explains the per capita transport infrastructure supply of each of the countries and of the region as a whole according to per capita GDP and industry share in GDP. Given the lack of homogenous information on transport infrastructure in some of the selected countries, it was necessary to estimate the transport material stock based on certain assumptions.

IV. Estimating the stock of “necessary” transport infrastructure

The “necessary” transport stock refers to the capital transport stock or transport material, measured in base-year constant prices, necessary in a country or region to match the growth rate of its international trade volume. For the purposes of this report, it can be interpreted as a synonym for the transport infrastructure demand.

International trade volume is used as a proxy for transport infrastructure demand. During recent decades, international trade has become increasingly more important in most of the countries of the world (including those in Latin America) as a result of reforms initiated with the aim of opening up trade. The infrastructure employed to directly or indirectly transport internationally traded goods therefore makes up a significant portion of the countries’ total transport infrastructure. One of the main signs of economic growth in Latin America during the past two decades has been the expansion of the goods trade with the rest of the world, which might be expected to

have brought about an equivalent development of infrastructure to match rising demand needed to drive larger volumes of international trade. The authors are well aware that one of the principal shortcomings of the model is its failure to take into account domestic transport volume, due to a lack of statistical information.

The variables explaining the evolution of transport infrastructure demand per inhabitant include per capita GDP and world GDP. In all the countries, the constant price series in national currency were expressed in dollars at 2000 prices in order to facilitate comparison. The gap was estimated using an index with a base of 1995=100 in order to determine whether it increased or decreased in each country. 1995 was chosen as the first year available for all the countries, after estimating some series. This does not imply that supply and demand were balanced that year, which will become evident below.

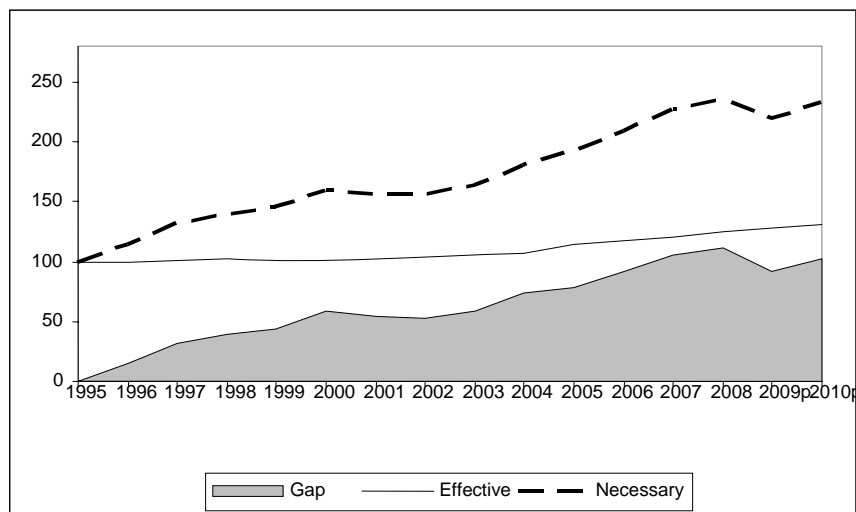
V. Results

Based on the “effective” and “necessary” transport infrastructure stock estimates and projections, the infrastructure gap is calculated as the difference between both variables. While in 1995 the difference is equal to zero, that does not imply that there was no infrastructure gap, but is due to the way the variables are constructed (indices with a base 1995=100). The goal is to show the evolution of the gap over time and not to estimate it in absolute terms. Therefore, a positive gap value does not necessarily mean an infrastructure stock deficit, but rather that demand is growing faster than supply.² In fact, during the 1980s and 1990s, the infrastructure gap widened between Latin America and other developing countries, such as the Asia-Pacific nations. During the crises of the 1990s, public investment in infrastructure fell and, particularly in the transport sector, private investment was lower than public investment. Consequently, the situation at the study’s starting point, in 1995, was characterized by inadequate infrastructure and a growing gap vis-à-vis Asia.

² Moreover, in order to simplify –since this is a preliminary study– the effective stock reflects an estimate of the infrastructure value, but does not take into account other important considerations, such as the “productivity” of different investments, and assumes that all are equally productive. This assumption should be eliminated in future research in order to calculate the gap more precisely.

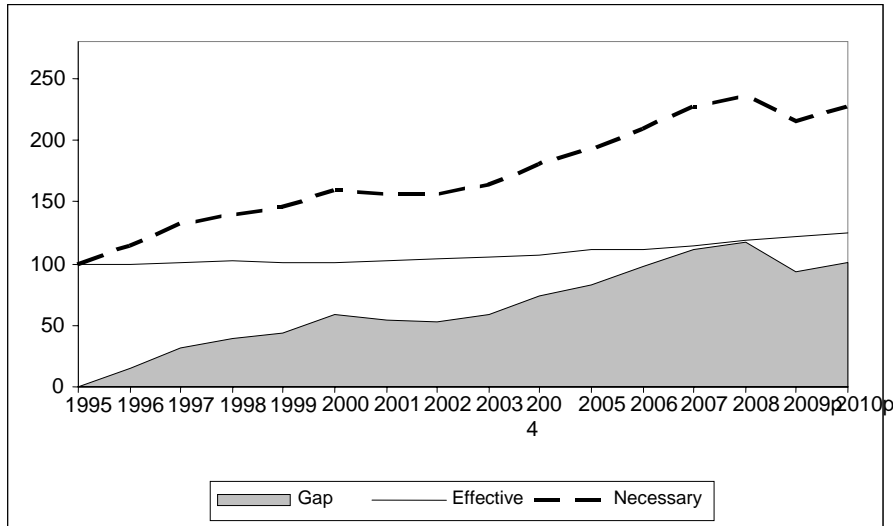
The results obtained show that the transport infrastructure gap grew during expansionary phases, but tended to shrink in recessionary phases. Two scenarios — one optimistic and one pessimistic—are considered in the calculations, differing in the 2009 and 2010 GDP projections for each country. Estimates for Latin America indicate greater growth in demand for transport infrastructure than in supply, meaning that the gap widened compared to 1995 during the entire period analysed, especially during the most recent expansionary phase, 2003-2007. In both scenarios, the gap is smaller in 2009 due to the contraction of world GDP and GDP in Latin American countries; however, it should begin to expand again beginning in 2010 (according to activity assumptions for 2010). Furthermore, as the region gets back on track with long-term expansion and as external demand recovers, the gap will continue to widen, which highlights the need to strengthen investment in order to increase the available transport infrastructure stock, while simultaneously increasing the productivity of these investments by making logistical improvements, incorporating intelligent transport systems and improving the operation of infrastructure services.

Figure 1
Estimating the evolution of the transport infrastructure gap in Latin America
a. Optimistic scenario



Source: Gayá and Campos, Unit of Infrastructure Services, ECLAC, United Nations 2009.

b. Pessimistic scenario



Source: Gayá and Campos, Unit of Infrastructure Services, ECLAC, United Nations 2009.

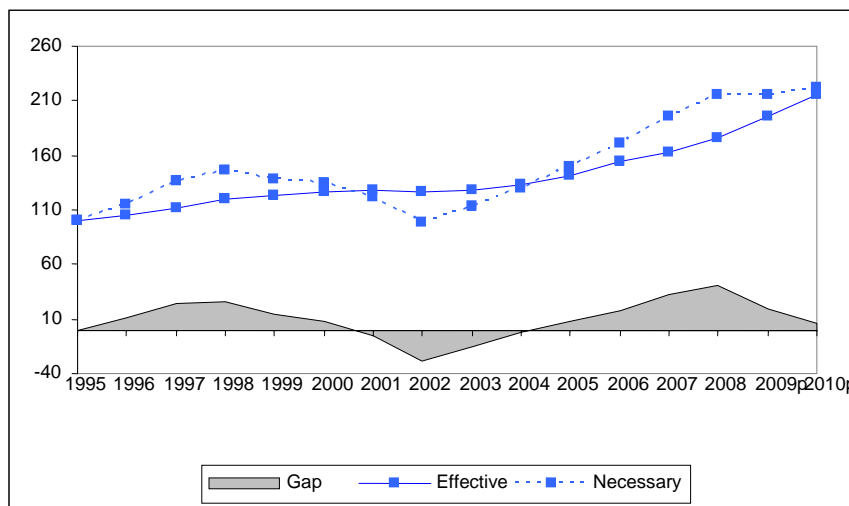
Due to limited space, the figures in this FAL Bulletin show only the optimistic scenario results of estimating the evolution of the transport infrastructure gap between 1995 and 2010 for each country selected.

Figure 2

Estimating the evolution of the transport infrastructure gap.

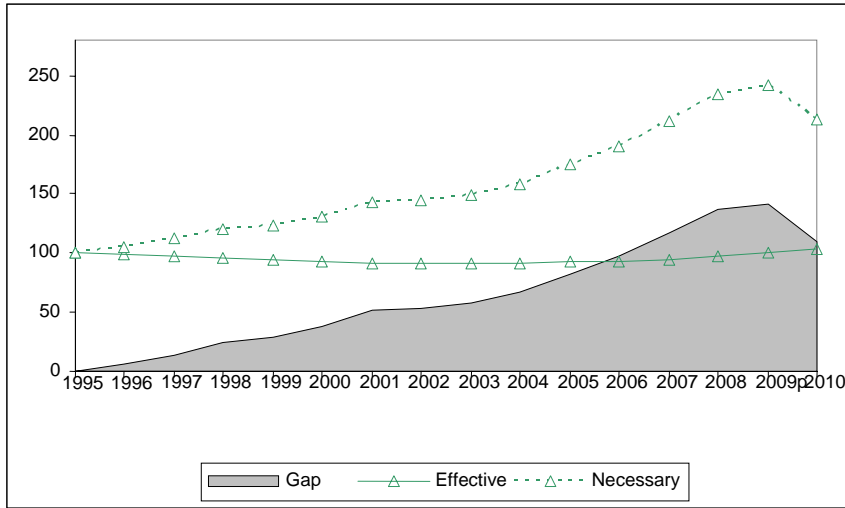
Optimistic scenario projections. Selected countries.

a. Argentina



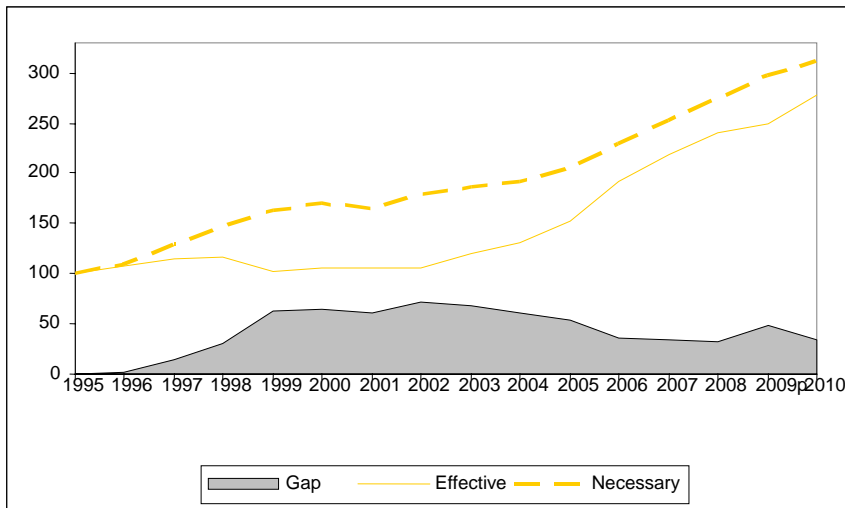
Source: Gayá and Campos, Unit of Infrastructure Services, ECLAC, United Nations 2009.

b. Brazil



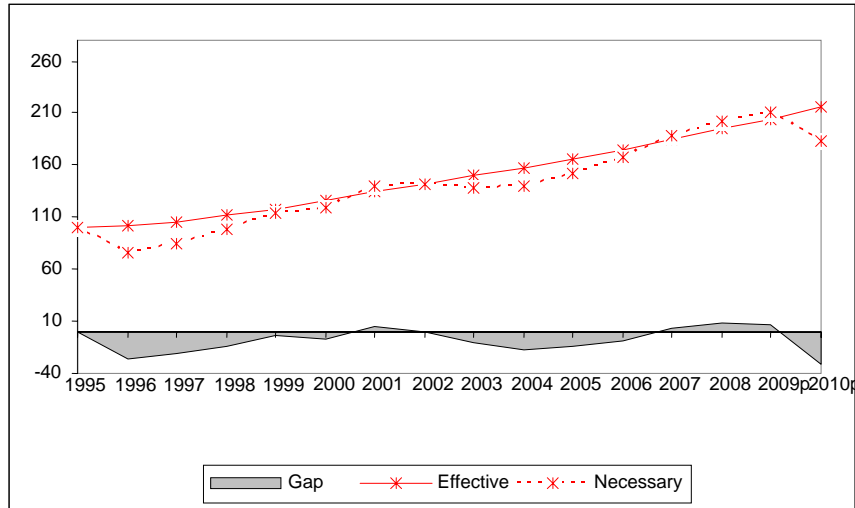
Source: Gayá and Campos, Unit of Infrastructure Services, ECLAC, United Nations 2009.

c. Chile



Source: Gayá and Campos, Unit of Infrastructure Services, ECLAC, United Nations 2009.

d. Mexico



Source: Gayá and Campos, Unit of Infrastructure Services, ECLAC, United Nations 2009.

VI. Conclusions

While these estimates provide only a general idea and represent the first step ECLAC has taken towards estimating the infrastructure gap in Latin America, it is clear that although GDP and trade in Latin American countries have grown in recent years, investment in transport capital has not been as dynamic, despite the engagement of the private sector in each of the countries studied.

It is not surprising to see a smaller gap in 2009 and 2010 due to the decline in economic activity and, consequently, in GDP and trade volume. Nevertheless, it is important to keep in mind that as soon as trade activity and external demand are back on track in terms of growth (signs of which are already apparent), the transport infrastructure gap in Latin America will once again increase, which could seriously limit the total volume traded, since infrastructure will be inadequate to efficiently meet demand in terms of quantity and conditions.

It is also important to keep in mind that this infrastructure lag refers not only to port or airport infrastructure, as might be assumed. Although many countries need improvements and expansions in these areas, they tend to be —generally speaking— the best suited for foreign trade. According to studies conducted by ECLAC, the greatest shortcomings are seen in inland sections (including rural roads and bridges) as well as border crossings, along with the traditional problems of transport facilitation and the operation of transport and logistical services.

For this reason, there is an urgent need to improve public policies related to infrastructure provision, where the State assumes a central role, overseeing not only design and construction, but also the quality of the service offered. To this end, it is fundamental to achieve a long-term vision within the Government, defining and implementing an investment plan in which the development of infrastructure services becomes a competitive tool for the countries of the region.

VII. Future areas for research

This report describes the exercise of estimating the evolution of the transport infrastructure gap in some Latin American countries. The hope is to expand this study soon, in order to more precisely estimate the limitations of transport infrastructure in the region, including more countries to the extent that the necessary statistical information is available. In order to analyse potential infrastructure saturation points, a more disaggregate analysis is required on the national level, inland transport sections must be included and productivity variables must be taken into account.

Another aspect to explore in future studies by the Unit of Infrastructure Services is to estimate the evolution of the infrastructure gap for different transport modes, both in selected countries and in the region as a whole. In order to accomplish this, models similar to those used in this exercise will be developed, which analyse the evolution of the supply, the demand and the transport infrastructure gap, making the necessary adjustments to adapt them to the specific characteristics of each mode and its share in the national modal split.

Throughout this Bulletin, there have been references to the lack of national and regional information, or the difficulties in accessing it, which is one of the main challenges preventing progress in this research. For this reason we invite our readers to contact us regarding the preparation or provision of national statistical information in order to build comprehensive, homogenous databases covering the quantitative and qualitative aspects of the different modes of transport infrastructure. This information will help us improve our diagnosis of the situation in the region and in each country in particular, thus contributing to economic and social development throughout Latin America and the Caribbean.