



**Emerging  
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# **Public-Private Partnerships and the Infrastructure Challenge in Latin America**

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## I. Introduction

Economists agree that infrastructure matters for growth. Adequate infrastructure is a prerequisite for increased access to global trade and investment flows, increasing competitiveness and thus sustaining regional growth. In fact improved infrastructure reduces transportation costs, excessive inventories and logistical costs, expanding markets and reducing distances between production and consumption centers. Good quality infrastructure reduces production costs, reducing prices and increasing the competitiveness of exports. Improved infrastructure also increases the attractiveness of the business environment for Foreign Direct Investment (FDI), increasing the local economy's involvement in international value chains. Furthermore, infrastructure makes growth more inclusive by better distributing the benefits of growth, for example by enabling the delivery of health, education and other services.

While economists agree that infrastructure plays a role in growth, the nature and scope of that role is still very much debated, and much recent research has focused on this topic. While evidence is mixed, there is a consensus that infrastructure positively affects growth, with the impact generally higher the lower a country's income level. Romp and de Haan (2005) and Briceño *et al.* (2004) carry out extensive reviews of papers that study the link between infrastructure and growth and find that the majority point to a positive impact of infrastructure on growth, especially in the case of developing countries. But findings vary greatly with respect to the magnitude of effects, in particular regarding returns to investment and elasticities. So infrastructure matters for growth, but the relationship varies across countries, over time, and between sectors (Estache and Fay, 2007). What does appear to emerge is that a minimum level of infrastructure is essential for a modern economy, and that this minimum level rises in line with a country's rise in per capita income. Without this basic level of infrastructure not only is welfare negatively affected, but resulting bottlenecks hamper country's growth possibilities (Tanzi, 2007).

Latin American governments have consistently faced severe obstacles in funding much needed infrastructure investments. The result has been inefficiencies, poor service and bottlenecks which have negatively affected competitiveness and economic growth. In the nineties, this situation led to a reassessment of the traditional model of public provision of infrastructure and related services, and increased participation of the private sector. But private participation in utilities and transportation industries has had mixed results, and social opinion has turned against it in many countries. While private participation remains a valuable instrument for infrastructure investment, the framework for such participation must change so as to increase the social and economic benefits. Private investment is not the silver bullet: public sector investment must also increase, and other sources of infrastructure financing must be actively explored. New forms of public-private partnerships (PPPs) have emerged from the experience of the past decades.

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The importance of regulation is one of the key lessons of recent experiences in PPPs, not only in Latin America but in other regions. In fact recent experience with European infrastructure programs has shown that to lure investment the right kind of regulatory environment is more important than public sector funds (Auer, 2004). The lack of long term, reliable and market oriented regulation has proved to be one of the greatest obstacles to infrastructure investment. One of the biggest challenges to governments in the region is achieving a regulatory framework that provides the necessary credibility and accountability for the efficient functioning of the sector, allowing for greater investment inflows.

Infrastructure reform cannot be embarked on without an understanding of the underlying political economy. Multiple vested interests interact to affect the goals and direction of infrastructure development. Interest groups that perceive themselves as “losers” will attempt to maintain benefits enjoyed in the past, while “winners” may not be organized enough to defend reforms. If the perceived “losers” have sufficient political veto power, institutional reforms may not be consolidated and infrastructure projects may be jeopardized (Vives, 2004). Such “redistribution traps” can often be avoided, or at least minimized, through greater participatory planning and involvement of the civil sector from the initial stages of the process.

Infrastructure development, as a component of sustainable development, has the potential to contribute to the environment through various means. For example, better roads means reduced travel times, less fuel usage and therefore less pollution. In the same way, the development of alternative transportation systems and adequate control of vehicle quality can reduce negative environmental effects. Nonetheless, to achieve these effects the public sector must provide sufficient control and follow-up of infrastructure projects and usage (Millán, 2007). Infrastructure projects lacking environmental assessments can easily have serious environmental and social impacts, such as the degradation of sensitive ecosystems, the loss of biodiversity and the displacement of indigenous people. Environmental impacts and risks must be considered in the initial stages of infrastructure projects, and environmental protection policies must be in place to ensure that undue risks are not being undertaken.

With the intensification of globalization, infrastructure development is often not an exclusively national issue. Many infrastructure projects are cross-border, and fulfilling infrastructure needs has increasingly fallen beyond the capacity of individual countries. On the other hand, adequate infrastructure is a critical prerequisite for regional integration processes, creating the possibility for the free flow of goods, services and people. Thus the need for regional cooperation in both infrastructure development and its financing.

This paper is organized in five sections (including this introduction). Section 2 gives a brief overview of developments in infrastructure in Latin America over the last decades, and the reasons for reduced infrastructure investment in the region. Section 3 discusses the challenges facing infrastructure development and financing in the region. Section 4 considers the different sources of financing available for infrastructure in Latin America. Section 5 discusses the role of regional cooperation in infrastructure. Finally, section 6 presents concluding remarks, which focus on the need to expand infrastructure investment in the region through a combination of increased public spending, improved public-private partnerships, new sources of financing and regional cooperation.

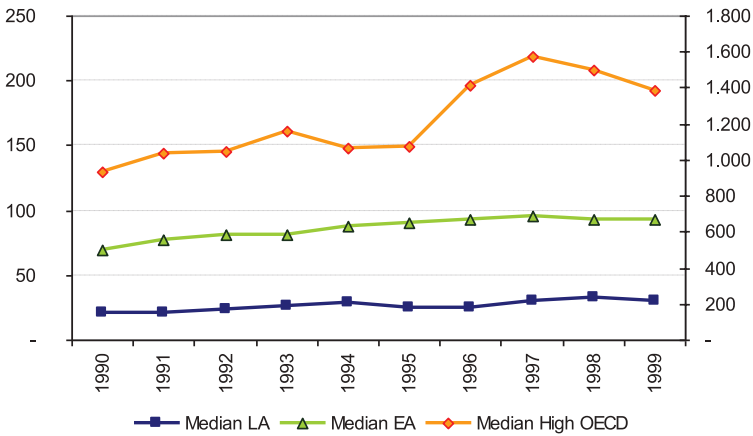
## II. Infrastructure in Latin America: Where We Stand

How much infrastructure does a country need?<sup>2</sup> Estimating the “optimum” level of infrastructure for a specific country has proved elusive. One strand of literature looks at the rate of return of infrastructure, with the idea that if rates of return are high a country is not investing enough. While this approach can give an indication of under or over investment, it does not help quantify infrastructure needs. Another approach attempts to estimate investment needs based on predicted GDP growth, extrapolating the future demand for infrastructure based on past consumer and producer behavior. One must keep in mind that this second approach, although widely used, is not based on an optimal demand for infrastructure that maximizes welfare or growth. Sophisticated engineering-economic models have been used to estimate individual industry investment needs in specific countries, but this can lead to unrealistic targets (Estache and Fay, 2007).

Given these difficulties, benchmarking against a country’s peers (same geographical region or similar level of income) or against a “success story” country, such as Korea, is often used. But given that a country’s infrastructure needs depend in part on its level of income and differing geographical, socioeconomic and productive characteristics, measuring a country or region’s relative infrastructure gap is therefore problematic, and empirical estimates of such gaps should be viewed simply as a way of getting an idea of the problem at hand.

With this in mind, the following graphs show how Latin America has progressively fallen behind in infrastructure, both with respect to the East Asia-Pacific region and, to a greater extent, with respect to the high income OECD countries. This is particularly pronounced in the case of roads and electricity. Latin America lags behind other regions in telecommunications, especially in terms of increases in telephone lines per worker and number of internet users; only in cellular telephones has Latin America showed significant improvement. In this case coverage levels are comparable or better than other middle income countries.

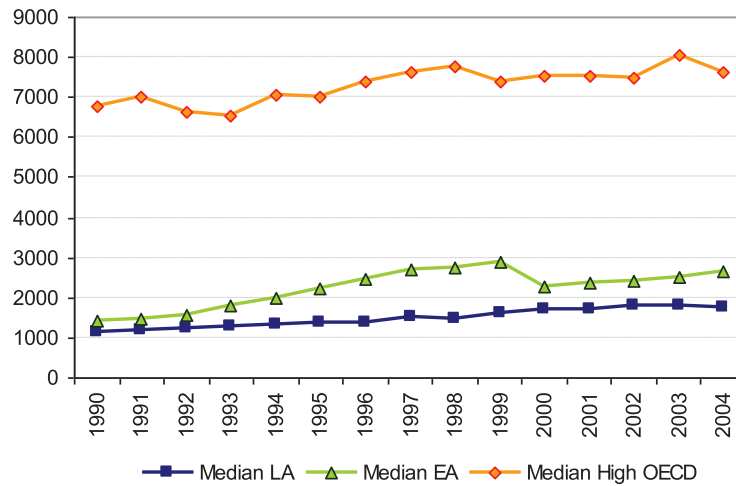
Figure 1: Roads paved (km. per 1,000 km<sup>2</sup>)



Source: own calculations based on World Bank (2007)

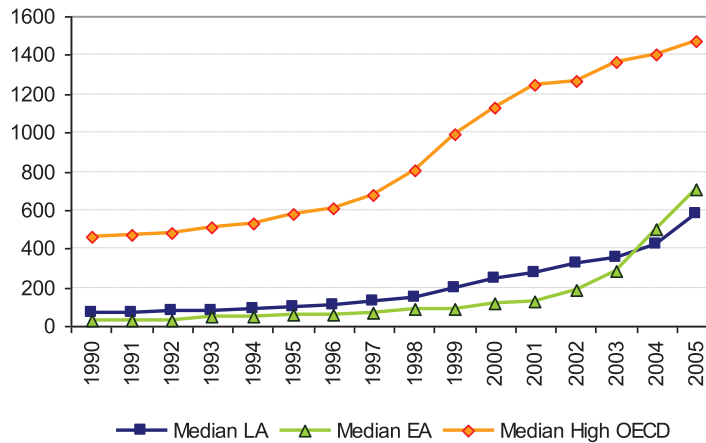
<sup>2</sup> See Estache and Fay (2007) for a more extensive discussion on differing methodologies for estimating infrastructure needs.

Figure 2: Electricity production (kWh per 1,000 people)



Source: own calculations based on World Bank (2007)

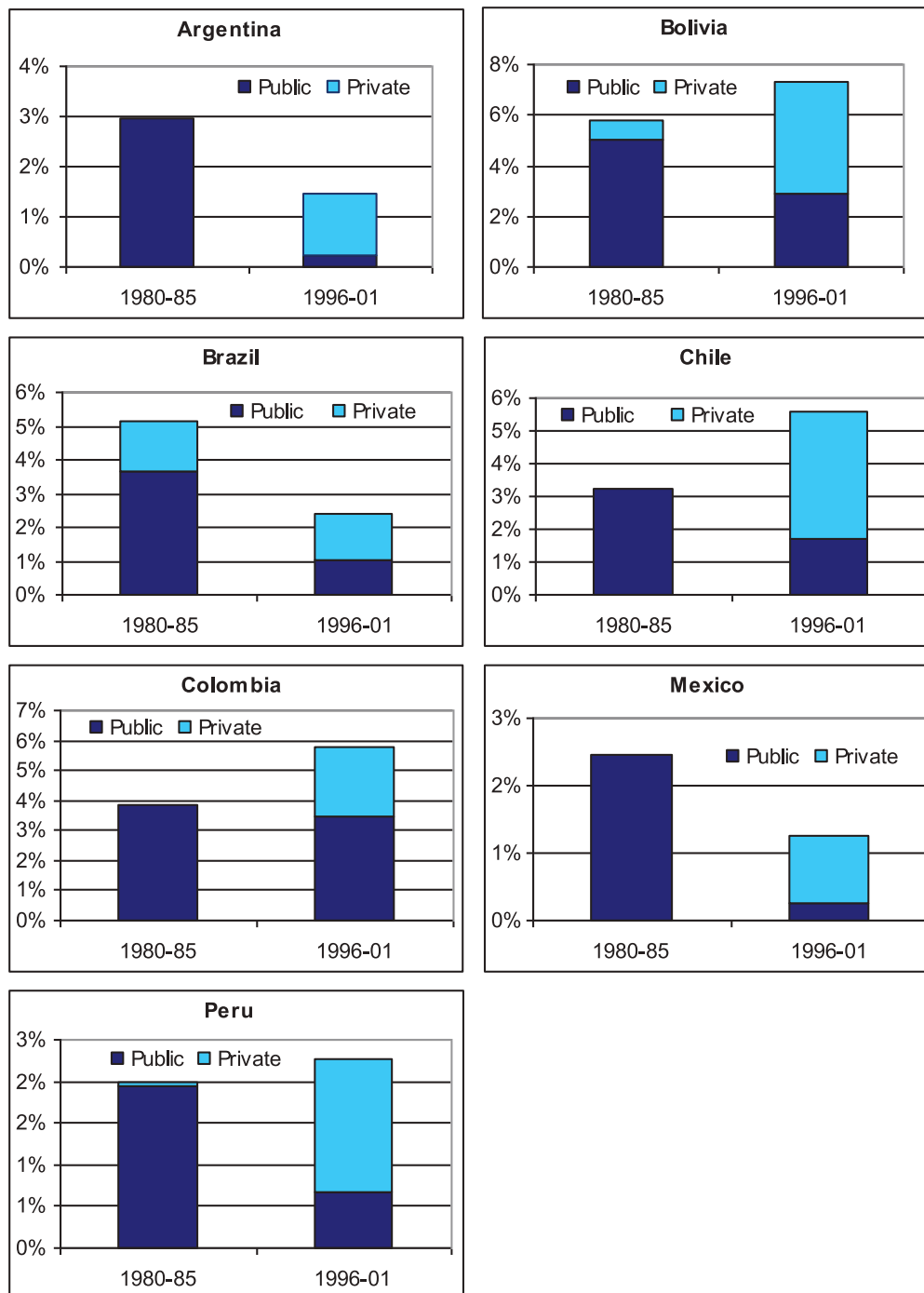
Figure 3: Fixed line and mobile phone subscribers (per 1,000 people)



Source: own calculations based on World Bank (2007)

Latin America’s widening infrastructure gap is largely due to a decrease in public infrastructure investment. On average, public spending in infrastructure as a percentage of GDP fell during the nineties in Latin America. This decrease was only in part due to fiscal adjustments resulting from macroeconomic crises, in reality what emerges is a structural tendency to reduce public spending in infrastructure as a consequence of the privatization initiatives. Private investment in infrastructure did increase during this period, but often was not sufficient to compensate for the fall in public spending. Private spending was also unequally distributed across infrastructure sectors: telecommunications and electricity were most successful in attracting private investment, transportation less so. Furthermore, private investment was unequally distributed across countries, with Chile, Colombia and Bolivia attracting the largest volumes (Calderón and Servén, 2004). The following graphs show infrastructure investment as a proportion of GDP for a sample of Latin American countries.

Figure 4: Infrastructure investment (public and private) as a percentage of GDP



Note: Total investment in infrastructure includes telecommunications, power, roads, railways and water. In Argentina it also includes gas.

Source: own elaboration based on Fay and Morrison (2007)

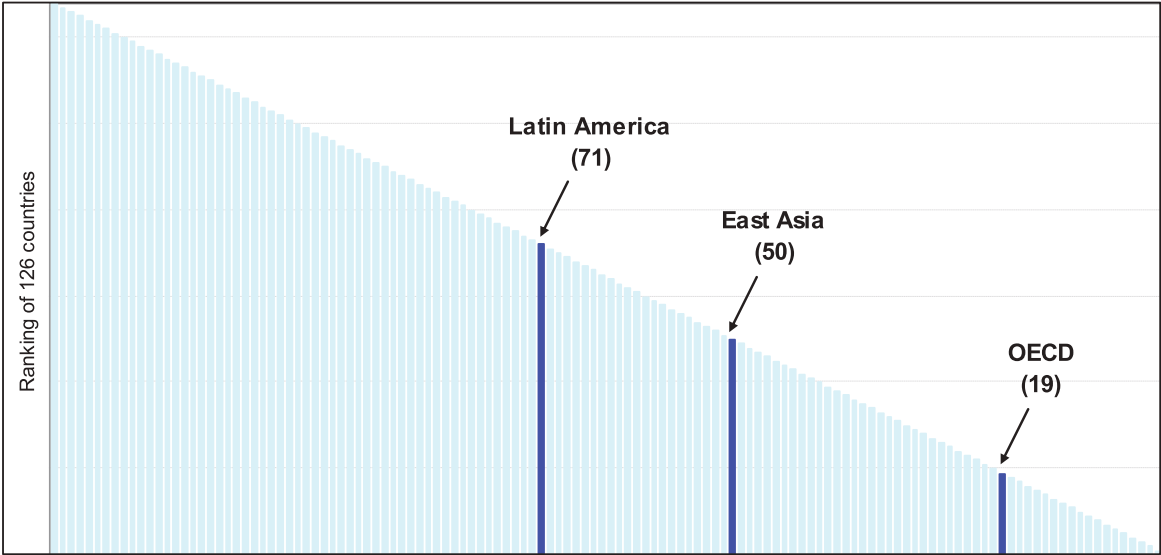
It is interesting to note that in all countries investment in telecommunications increased during the period examined, while investment in land transportation decreased in all countries except Chile. Total investment in electrical power decreased in all countries except Chile and Colombia, where increased private spending was sufficient to offset a contraction in public spending.

This reduced investment in infrastructure was due to a combination of different factors, which include: slowdowns in growth, the flight of external capital from the region following the financial crises that hit emerging markets, together with social reluctance

to foreign investment, thin domestic financial and capital markets, low national savings rates, weak regulatory frameworks, fiscal constraints, lack of commitment by relevant stakeholders and a dismantlement of governments' medium term planning capabilities.

Poor infrastructure contributes to the region's low performance in international competitiveness indexes and hinders the inflow of FDI. According to the World Economic Forum's "Global Competitiveness" report, most countries in the region rank consistently in the bottom half of the sample with respect to overall infrastructure quality, with average Latin American ranking well below East Asia (see figure 5).

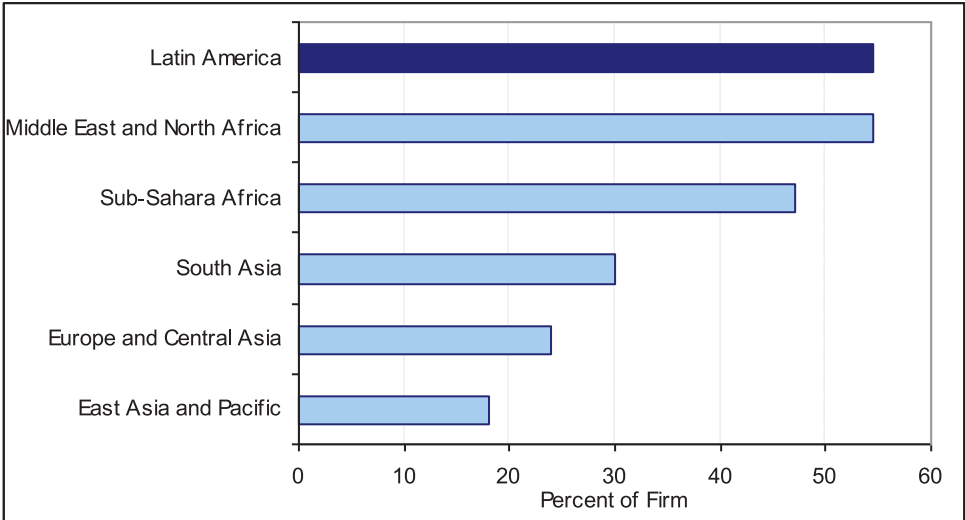
Figure 5: Overall infrastructure quality



Note: 1 corresponds to country with highest overall infrastructure quality ranking.  
 Source: World Economic Forum (2007).

According to World Bank investment climate surveys, more than half of respondents –the highest level for any developing region, except the Middle East and North Africa– consider infrastructure in Latin America a serious obstacle to doing business in the region. (See Figure 6)

Figure 6: Businesses that consider infrastructure a serious problem (by region)



Source: World Bank (2004)



### III. Challenges of Infrastructure in Latin America

Regardless of the actual estimates of Latin America's infrastructure gap with respect to the rest of the world and to other developing countries in particular, what emerges is the need for the region to invest more. Estimates of high rates of return on infrastructure investment in the region also point towards the need to increase investment. One of the main challenges that Latin America faces is how to fund these investment needs. Both public and private funding will be required.

Private participation in Latin America boasts numerous success stories, in other cases results have been more mixed. In fact, in many cases privatization has resulted in greater coverage and quality of services, and higher operational efficiency. A study of privatized utilities in Latin America finds that private sector participation increased coverage significantly in the case of telecommunications, as well as increasing –although to a lesser degree– electricity distribution (Andres, Foster and Guasch, 2005). Other studies find evidence of improvements in labor productivity, and positive welfare, mainly through increased coverage.<sup>3</sup>

But popular sentiment has turned against private participation<sup>4</sup>, in part as a reaction to a number of highly publicized failures, that have resulted in private monopolies, excessive tariffs and unfulfilled obligations. Another source of discontent has been associated with the high rates of renegotiations of private participation contracts: 42% on average for the period 1988-2001 (Guasch, 2005).<sup>5</sup> When renegotiation is the result of opportunistic behavior by one of the two parts, the result is often socially detrimental: delays on investment obligation targets, reduction of investment obligations and tariff increases have been the most common results of renegotiations in the region. Renegotiations initiated by government increase the risk of private participation, and therefore the costs to the public sector as investors demand greater guarantees. Furthermore, excessive renegotiations reduce transparency and increase uncertainty, as new terms are determined by the parts' relative bargaining power as opposed to the initial competitive process (Fay and Morrison, 2007).

Although the mixed results of private participation in the region have caused a certain backlash, it is important to realize that private participation, while not a silver bullet, is certainly not to be dismissed a priori. It is important to recognize that the experience with private participation in infrastructure, while disappointing in some cases, has not been all bad, and useful lessons can be learnt from past experiences to improve the performance of private participation in the future. As investment needs remain beyond the capacity of government budgets, private involvement continues to be required.

Lessons learned include the following. First, excessive renegotiations point to poorly designed contracts and weak regulatory regimes. Second, excessive government guarantees have subjected governments to huge liabilities. More efficient mechanisms of risk sharing are called for. Third, benefits have been distributed unevenly, with a strong

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3 See Fay and Morrison (2007) for a more in depth discussion of the results of private participation in the region.

4 According to Latinobarometer, in 1998 46% of Latin Americans thought privatizations were beneficial, in 2005 the percentage had fallen to 31%.

5 Renegotiations have been uneven across sectors, ranging from 10% in electricity to 57% in transport and 75% in water and sanitation.

preference to reducing fiscal deficits, and less to protecting more vulnerable elements of the population. This was often the result of a disconnect between social policy and sector reform. Fourth, greater transparency and community participation early in the process could have helped shape social consensus and foster greater public acceptance. Finally, the public sector must continue to retain an important role in the provision of infrastructure funding and the regulation of public utilities.

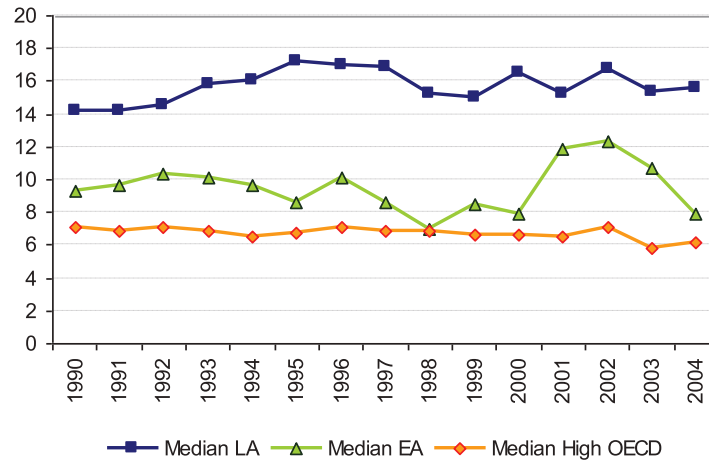
Regardless of how the government chooses to finance infrastructure investment, certain elements remain squarely its responsibility. Governments are responsible for the political economy of infrastructure reform, in particular the appropriate distribution of the costs and benefits of such reform. Furthermore, governments are ultimately responsible for social goals, even when the private sector participates in the basic utilities and services. Finally, governments are responsible for providing a regulatory regime and a financing framework (for example through the development of local markets) conducive to efficient and effective infrastructure investment and asset maintenance.

Macroeconomic uncertainty and the mixed results of infrastructure projects in Latin America have made private investors and operators wary of the region: increased risk protection will be necessary to attract them back. At the same time, as will be discussed below, governments should be careful about taking on undue risks associated with private participation in public infrastructure projects. Increased risk protection can be achieved through increased participation of multilateral agencies as guarantors, and the development and increased use of innovative financial structures and instruments.

Nonetheless, private investment is not a panacea nor a blanket solution to infrastructure financing needs. Both new markets (such as those that use local currencies, for example by taking advantage of national pension funds) and new financial instruments (like securitized bonds) should be investigated as possible sources of funding for infrastructure. Financing for infrastructure can also be increased by strengthening local governments' access to internal and external financing.

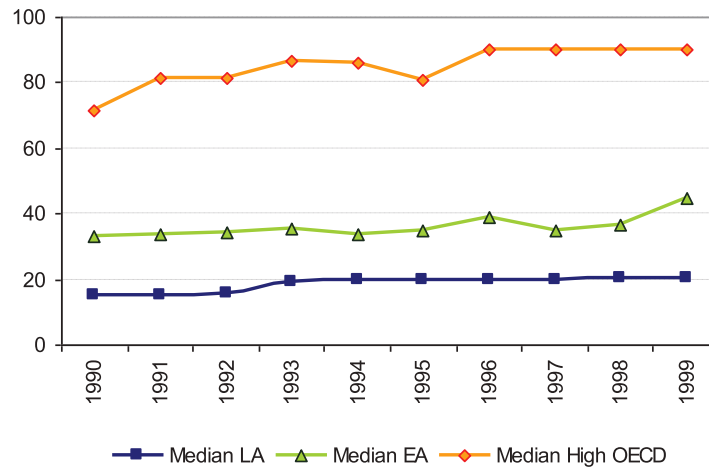
Not only does the region need to invest more, it needs to invest better. Infrastructure investment should be directed not only to closing gaps, but to using existing infrastructure more effectively. Evidence has shown that middle and low income countries that use their infrastructure inefficiently receive reduced benefits from their infrastructure investments, which ultimately results in lower growth (Hulten, 1996). In fact, when infrastructure is used inefficiently, an increase in its stock is of little use in stimulating economic activity. Figures 7 and 8 give an idea of the inefficiencies in infrastructure in the region, with respect to electricity and road transportation. Figure 9 shows some of the infrastructure costs to businesses in the region.

Figure 7: Electric power transmission and distribution losses (% of output)



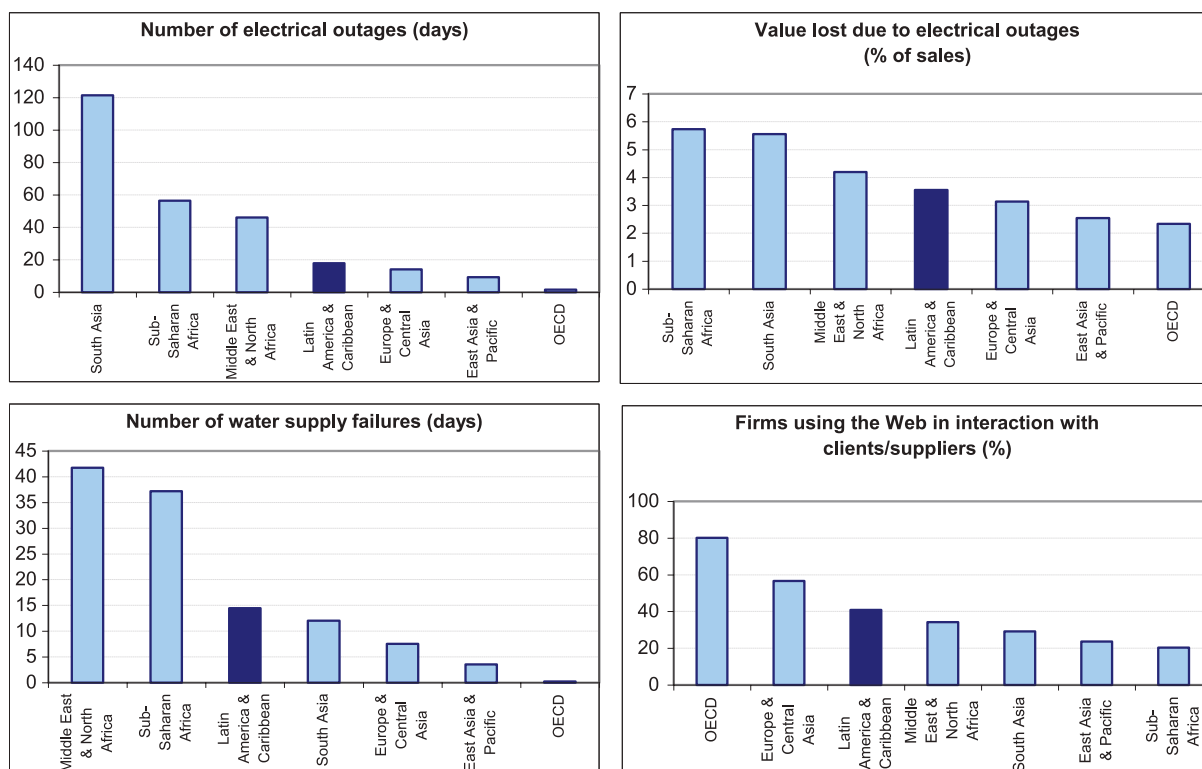
Source: own calculations based on World Bank (2007)

Figure 8: Roads paved (% of total roads)



Source: own calculations based on World Bank (2007)

Figure 9: Business costs associated to infrastructure



Source: World Bank and IFC (2006).

“Better” infrastructure investment can take a variety of forms. It implies allocating more resources to maintenance, which allows for important long run savings, and not only capacity building, which may be preferred by current administrations for its greater visibility. “Better” investment also means subsidies need to be better targeted, freeing up resources that could be better directed towards additional investment and maintenance. Finally, institutional reforms that lower the risks of infrastructure investment increase the incentive for investor participation and decrease the need and expense of providing government guarantees.

More funding needs to be directed towards maintenance. Often governments in developing countries neglect maintenance in favor of more high profile new infrastructure investments. Since maintenance affects both infrastructure durability and efficiency, this has a negative effect on infrastructure quality, and implies higher costs in the long run. For example, it is estimated that with maintenance, a paved road should not require resurfacing for 10-15 years, but without maintenance severe deterioration of road conditions can require resurfacing in as little as 5 years (Fay and Morrison, 2007). Furthermore, there is evidence that infrastructure maintenance has a higher economic return than investments in new projects. One strategy to increase the incentive for investment in this area would be to increase the visibility of maintenance projects, through inaugurations and public awareness programs. Another is to earmark specific taxes to maintenance funds.

Infrastructure investment should be based as much as possible on sound economic assessments. Unfortunately, infrastructure investments are increasingly carried out without the screening of cost-benefit analysis, which provide a useful technical filter to prevent uneconomic projects from going forward. An effective evaluation of infrastructure projects, by eliminating inefficient ones, can free up public funds, allowing for the accommodations of more efficient projects (Tanzi, 2007).

To invest “better”, it is important to understand that decisions regarding infrastructure projects often do not respond to purely economic motivations. For example, public investment in infrastructure may be motivated by the desire to integrate an isolated area of the country, or provide services to an under-represented population. Furthermore, public investments in infrastructure are highly vulnerable to the lobbying pressures and other political considerations. If political pressure is compounded by corruption, resulting investments can lead to misguided, excessive spending and low quality infrastructure (Tanzi, 2007; Tanzi and Davoodi, 1997).

Investment in infrastructure as a basis for sustainable development does not depend simply on higher levels of public spending and private investment. Recent evidence on failed privatizations points to inadequate regulation being a common element. This can lead to suboptimal levels of competition, or excessive capture of privatization gains by service suppliers, at the expense of consumers and taxpayers (Chong, 2004). A long term and market oriented regulatory policy not only would save considerable amounts of public funds, but would also accelerate the pace of necessary private investment.

Regulatory issues in Latin America are markedly different than those of more developed economies. Industrialized countries in fact have already solved the problem of universal access to services, and do not have to make subsidy decisions constrained by severe fiscal restrictions. In such countries, regulations serves to spur competition and efficiency. In Latin America, in contrast, the key issues in infrastructure are insufficient coverage coupled with high regulatory risk, especially in the case of decentralized infrastructure provision. An often weak centralized regulator faces the challenge of supervising a universe of decentralized firms. In this latter case, for regulation to be effective it must be part of a comprehensive package that includes proper industry structure, technical support, appropriate incentives and community participation (Vives, 2004).

Past experience has provided some lessons with respect to infrastructure regulation. To increase credibility in the system, regulatory reform should be grounded in laws, making it more difficult for political motivated interferences due to the changing priorities of different administrations. Regulatory agencies need to be independent, to ensure decision-making autonomy. And regulatory agencies need to be accountable, with open decision-making procedures and regular public reporting (Fay and Morrison, 2007).

Regulation should be focused, as an excess of regulation can also be prejudicial, stifling competition and impeding the efficient function of markets. Regulatory agencies should concentrate on promoting and protecting competition, and in the case of concessions should seek to establish prices that achieve a balance between economic efficiency and social equity. Furthermore, infrastructure regulation should ensure that infrastructure services provide adequate quality (including guarantee of service) and that the protection of public health and the environment comply with established minimum standards (Millán, 2007).

Another important aspect of regulation is the quality of the associated bureaucracy. Evidence has shown that a stable, professional bureaucracy, instead of a temporary, politically-elected one has the effect on increasing the amount of time policy makers are willing to wait for the benefits of public expenditure. This in turn has a positive effect on the proportion of resources allocated to long run projects, such as infrastructure. Regulatory decisions should be independent of short term political considerations.

## IV. Sources of Financing for Infrastructure

### *Increased Role of the Public Sector*

Notwithstanding many countries experiments with private sector participation in infrastructure, it is important to underline that not only will the public sector continue to be a main player in this arena, it must increase funds dedicated to infrastructure investment. Estache (2005) notes that although Latin America recorded a massive \$361 billion in private infrastructure investment between 1990 and 2001, the largest volume recorded for any region, this only covered between 25 and 33% of the region's annual investment needs. Infrastructure continues to be an area where the public and the private sector must work together.

One important issue is determining which investments should be carried out by government, and which should attempt to attract private investment. One rule of thumb is that public resources should be used for investments –including maintenance– that have high social impacts but low financial rates of return, while private resources can be better mobilized towards investments with higher financial rates of return. This approach however requires sound economic and social assessments so as to prioritize investments (OECD, 2006).

Another key issue is making public expenditure more efficient. A first step in this direction would require more participatory planning, to make sure the benefits of private participation are more equally distributed, and proceeds go where needed. Increasing stakeholder involvement can help tailor projects and provisions to community needs, and encourage greater ownership, reducing the probability of backlash against a project. Nonetheless, one must be careful because increasing the number of players involved may cause diseconomies of scale and exacerbate conflicts of interests among different parties.

It is important to underline that increasing public financing in infrastructure without a sound regulatory framework can result in inefficient and unnecessary spending, and hinder fruitful participatory agreements with the private sector. As mentioned above, the public sector is responsible for providing a regulatory and institutional framework attractive to investments and conducive to an efficient use of funds. Part of regulatory reform should include increased transparency of processes and contracts, and greater accountability. Increased transparency should occur both at the bidding and award stage, and with respect to performance and budgetary scrutiny. Increasing public participation in the monitoring phase also serves to increase accountability.

Finally public funding plays a key role not only as a partner to the private sector in specific projects, but as a provider of complementary investments that increase returns to a specific project. Such complementary investments are essential to “crowd in” private investment. One such example is access roads to a privately sponsored toll road, without such access roads the toll road could under-perform in terms of ridership and therefore generate insufficient revenue to be financially viable (Leipziger, 2004). This type of infrastructure must not be neglected.

### *Inducing FDI*

Foreign Direct Investment (FDI) is an important source of financing for developing countries, and for Latin America in particular. During the nineties, the boom years of FDI, FDI flows to developing countries rose dramatically, with Latin America being the

main destination. Multinational strategies in Latin America have changed dramatically: from mainly tariff jumping FDI in the sixties and seventies, to a greater interest in service industries in more recent years. Many such services are tied to infrastructure, such as in the case of telecommunications and energy distribution. Nonetheless, such flows have lagged over the last decade, and countries in the region need a specific strategy to draw back these investments.

The relationship between infrastructure and FDI is a two way street. On the one hand, FDI can be a valuable source of funding for infrastructure. On the other, a country's level and quality of infrastructure is an important element in determining its appeal to a multinational enterprise (MNE), in particular with respect to its possibility of becoming part of a global production chain. MNEs are often sensitive to the availability of adequate infrastructure in deciding where to locate investments associated with the provision of local, regional and global markets.

An interesting trend in the region has been the increase in FDI originating in the region (the so-called "trans-Latins"), part of a general trend of increased FDI originating in developing countries. Latin American FDI originates mainly from four countries: Argentina, Brazil, Chile and Mexico. This trend has also affected FDI in infrastructure, as in the case telecommunications (for example América Móvil, TELMEX), electricity (Enersis, Gener; ISA) and air transport (LAN, TAM). The hydrocarbons sector has also played a significant part in outward FDI from Brazil and the Bolivarian Republic of Venezuela. (ECLAC 2006). In short, trans-Latins and FDI from within the region can serve as another source of financing for infrastructure in Latin America.

Nonetheless, past experience has revealed some shortcomings of trans-Latins, and can serve as lessons for the future. In the sector of public utilities, many trans-Latins took advantage of initial comparative advantages tied to knowledge of local markets and sector specific expertise, only to be targeted for take-over by foreign multinationals. The region has therefore witnessed a considerable number of "shooting stars", trans-Latins with the potential to compete globally but who have lost their initial comparative advantages and been taken over by foreign firms. The trans-Latins weaknesses are often tied to local firms' limited capacity to incorporate modern technologies and managerial practices, allowing them to form profitable international linkages while retaining control over their operations. To overcome this situation trans-Latins will need to increase their capability to absorb new technologies and increase their bargaining power, while governments in the region will have to attract higher quality FDI (ECLAC, 2006). Intra-regional FDI should be considered a complement, and not a substitute, to high quality extra-regional FDI.

#### *Public-Private Partnerships*

As noted above, the large gaps in infrastructure financing require private sector involvement. Private participation can take many forms, according to the degree of risk transferred to the private partner. Public-private partnerships (PPPs) are different forms of contractual arrangements by which the public sector gives a private entity the right to build, operate, manage and/or deliver a service to the public, and generally describe a spectrum of possible contractual arrangements between the public sector and private entities for the cooperative provision of infrastructure services. This can imply the private actor financing, operating, building, managing and/or delivering a service to the public. Private actors include private businesses, but also non-governmental organizations (NGOs) and community based organizations.

One way of classifying the spectrum of public-private partnership options is on the basis of relative investment of the two sectors, and the degree of involvement of the two parties. The changing role of government is of particular importance, as it ranges from total responsibility for all aspects of infrastructure, to regulator and enabler in cases where the private sector finances, builds and operates a given project. Private involvement is lowest for service and management contracts, where infrastructure is usually already in place and the private sector mainly provides technical and managerial expertise, and is greatest in BOTs and BOOs<sup>6</sup>, where the private sector also participates actively in infrastructure construction. On the other hand, public involvement varies between the role of provider of basic infrastructure in the case of service and management contracts, to a role of enabler and regulator in the case of BOTs and BOOs. Given the different implications of different forms of PPPs, the development of such partnerships should be done with adequate preparation and assessment so as to choose the best option for a particular project.

As commented above, in the face of the considerable backlash towards private sector participation in infrastructure projects in Latin America, one must not lose sight of the important role the private sector can play in infrastructure provision. At the same time, current PPPs should be improved taking advantage of the lessons of experiences of past decades.

Public-private partnerships are not just about attracting funding to a low resource sector. Through PPPs, the private sector also brings technological know-how, managerial efficiency and entrepreneurial spirit. The public sector, on the other hand, brings local knowledge of the sector, and, optimally, community participation, social responsibility and environmental awareness. A well structured partnership can therefore bring great benefits to both rural and urban infrastructure.

An important challenge to government is the need to improve the distribution of benefits from private sector involvement in infrastructure. In many cases in the past the benefits of privatization in Latin America, in terms of public assets sold, have been disproportionately captured by Ministries of Finance to cover current budgetary deficits. It is estimated that during the nineties approximately 60% of the proceeds of privatization in the region were used to cover budgetary deficits (Leipziger and Foster, 2002). The current consensus is that distributional issues should be taken into account in the early stages of PPP project design, that greater attention should be given to transparency of transactions, in particular with respect to the use of privatization proceeds, and that communication with the public regarding the need for and the consequences of reform should be improved. Greater community participation in PPPs is an important step in achieving these goals. Furthermore, greater attention should be given to designing tariff and subsidy structures in line with social objectives.

Public-private partnerships can be a valuable instrument in increasing infrastructure investment in the region, bringing to the table both capital and management skills. However, badly negotiated partnerships can impose an undue burden on government finances. Such partnerships should imply adequate risk transfer from the government to the private sector, otherwise debt is simply moved off the fiscal balance sheet, while the government risks potentially large future costs, eventually to be borne by taxpayers (Hemming and Ter-Minassian, 2004).

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<sup>6</sup> Build Operate and Transfer (BOT) and Build Own Operate (BOO).



Infrastructure projects tend to be long term endeavors, exposing involved parties to an array of risks over time. Risks endemic to infrastructure projects include macroeconomic risk, currency risk, market risk, regulatory and political risk, and project design and implementation risk. Box 1 discusses some sector specific risks associated with PPPs. Infrastructure projects in Latin America are also particularly vulnerable to natural disasters. How risk is allocated between the government and the private sector in a PPP is a key factor to the partnership's success.

**BOX 1: Sector specific risks: Transportation and electricity.**

Beyond the general risks that apply to all infrastructure projects, there are also sector specific risks that investors must take into account, and that should be contemplated in infrastructure contracts. A survey of 107 major Spanish companies active in Latin American infrastructure highlighted the following sector specific risks in the case of transportation and electricity.

*Transportation:* Demand volatility is a high risk associated in particular with highways and toll roads, but also with ports. If traffic forecasts were overestimated, the economic balance of a concession could be placed in jeopardy. This is also the case if the level of commerce envisioned did not take into account the opening of new ports or of alternative routes. Also, in countries where security is an issue tollbooths are particularly vulnerable to hold-ups. Finally, there is a risk of tollbooths being avoided by the use of detours over country roads.

*Electricity:* Given the prevalence of hydroelectricity in the generating mix in Latin America, one specific risk is tied to the erratic nature of rainfall. Distribution companies are vulnerable to institutional and regulatory risk, in particular to the danger that authorities force them to take on the full weight of a sector crisis. A culture of not paying for service, the pervasiveness of illegal connections and "electricity theft", and the political and legal obstacles to demanding payment or cutting supply to non-payers make cost recovery difficult.

Willingness to pay is a risk that can affect both sectors: the risk that agreed tariffs are later rejected by users, especially in the face of other shocks. This may be tied to the problem of tariff-rigidity, the resistance to adjust local currency tariffs after a devaluation, thus compromising the ability to service foreign debt linked to infrastructure investments.

Source: Based in part on AFI (2004).

In the face of such risks, investors often request some form of government guarantee. But such guarantees often place undue burden on the public sector, undermining the benefits of private sector participation. In fact, excessive risk coverage by the government reduces private investors' incentives to choose financially sound investments and technological options, and to manage them efficiently. Furthermore, since guarantees in general do not appear on fiscal balance sheets and it is often difficult to measure their economic impact, governments may grant guarantees which entail excessive costs to taxpayers and consumers. Governments face the challenge of encouraging private investment in infrastructure, while avoiding incurring undue future liabilities.

A first step towards a more equitable risk allocation in PPPs is a careful design of guarantees –how risks and their associated guarantees are measured and included

in the public budget– which in turn would allow for more informed decisions. In fact, when guarantees are not properly valued, governments tend to undervalue their costs, and pass them on to future administrations. Various techniques –such as those based on option theory– can be used to calculate expected losses associated with guarantees. Once reliably calculated, these expected losses should be incorporated into government accounts. This, however, could require reforms in the current systems of government accounting and budgeting. (Thobani 1999)

A second issue has to do with which types of risks should be borne by the public sector, and which by private investors. Risk theory calls for risks to be allocated to the agent with the most influence over the risky outcome, or the agent who can bear the risk at the lowest cost. But these two elements often do not coincide within the same agent: often the agent with the greatest influence over the risky outcome is the least capable of bearing the associated risk, or vice versa. In general, governments can increase the benefits associated to PPPs by assuming risks within their control, but should avoid taking on other risks. Instead of using guarantees in these latter cases, governments can design appropriate mechanisms for risk sharing with the private sector and final users, as well as take steps to improve the environment for risk allocation, such as pursuing stable macroeconomic policies, disclosing information, strengthening the judiciary and implementing good laws and regulations.

In some cases the involvement of multilateral institutions can provide a form of risk mitigation. In fact, some kinds of risk, such as political risk, are caused by actions of the government itself, so a political risk guarantee by the host government is considered of little value. Precise and specific guarantee mechanisms can contribute to an investment climate of greater confidence and security. One such example are partial risk guarantees (PRGs) from multilateral institutions, which serve to protect lenders and bondholders against an array of perceived risks, and provide project companies with the credit enhancement needed to raise sufficient financing.

Innovative mechanisms are necessary to deal with specific types of risk. In Chile, for example, the Income Distribution Mechanism (MDI) was developed as a guarantee against the risk of traffic reductions on highway concessions. According to this mechanism, a concession can be changed from fixed to variable length, ending when the derived income reaches a certain guaranteed level. If income growth is slower than expected, the duration of the concession is lengthened; if income growth is faster than expected, it is shortened. To be allowed to use the MDI, the concessionaire must agree to make new investment equivalent to 8% of the present value of the guaranteed income. If traffic flows increase less than an agreed amount, the concessionaire is allowed to raise tariffs by a certain amount every year up to a predetermined ceiling. This way, the MDI decreases project risk by guaranteeing payment of debt, even if actual traffic was overestimated, and reduces shareholder return volatility (even though the obligation to make new investments reduces profitability) (AFI, 2004).

### *New Sources of Financing*

Infrastructure projects should also take advantage of and continue to search for new sources of financing, which can contribute to the functioning of PPPs. Local markets should be exploited as potential sources of infrastructure funding, not only to increase financing availability and diversification, but to reduce currency risks associated to projects being funded with foreign-denominated debt when revenues are instead in

local currency. Increasing the involvement of local banks and financial institutions in infrastructure requires renewed effort to create new financial instruments and greater reliance on local currency funding.

Infrastructure projects are usually long run endeavors. Local capital markets in Latin America are generally not capable of providing the necessary long run funding, and investment instruments for such funding are generally lacking. For local markets to become a source of long term infrastructure financing, local entities have to become reliable borrowers, and long term funds need to be available at acceptable conditions. Governments in the regions should continue to push for the reforms necessary to deepen local capital markets and increase the availability of long term domestic capital.

In the changing capital markets environment, infrastructure financing should shift from bank-based to increasingly more capital market-based. Local bond issues by international banks, such as those taken place in Chile, Mexico and Brazil, are a move in this direction.

Pension funds are a possible funding source that has not been sufficiently tapped. Many countries in Latin America have pioneered pension fund reforms, but pension portfolios tend to remain concentrated in short-term, fixed income instruments. Diversification into longer-term assets tied to infrastructure investment cannot only contribute to infrastructure financing needs but also help alleviate the mismatch between pension portfolio investments and long-term obligations to pensioners (Strong *et al.*, 2003).

Chile provides an interesting example of how pension funds can contribute to infrastructure financing. In the early nineties, pension funds invested in both publicly listed equity and bonds tied to infrastructure, which had a strong positive effect of pension funds' performance. Chilean pension funds also invested in Infrastructure Bonds issued by private concession companies and in shares of the Real Estate and Company Development Investment Funds (Fondos de Inversión Inmobiliarios y de Desarrollo de Empresas). These are guaranteed by private insurance companies against construction and operational risk, and thus have an AAA rating (LASFRC, 2005).

Infrastructure Funds are another source of innovative financing for the sector. The Latin American Infrastructure Fund (LAIF), for example, founded in 1995 with an issue of \$1 billion, is the largest of its kind in Latin America. Pooling the resources and expertise of several players with extensive operational knowledge of the region, the fund offers mezzanine financing, which combines debt and equity features, generally not available in Latin America. The Fund has strong multilateral support through the participation of the Inter-American Development Bank (IADB) and the Corporación Andina de Fomento (CAF).

In short, greater investment in infrastructure is needed in Latin America. Resources for this investment must come from a variety of sources: both traditional, such as public funding, private investment, and FDI, and newer sources such as local markets and through the use of innovative financial mechanisms. Public and private players in the region must take advantage of lessons learnt from past experiences of private participation to achieve more efficient and socially effective PPPs.

## V. Regional Cooperation in Infrastructure

As noted above, adequate infrastructure is a prerequisite for regional integration processes, articulating neighboring territories and facilitating the free flow of goods, services and people. In many cases infrastructure development is not an exclusively national issue. Many infrastructure projects are increasingly cross-boundary by nature, and/or provide important spillovers to neighboring countries. In this case, fulfilling infrastructure needs often requires more than domestic investment, and regional solutions will be necessary to achieve infrastructure goals. Without regional cooperation, cross-border infrastructure will be difficult to implement, and countries will tend to underinvest in national infrastructure characterized by positive spillovers on neighbors and trading partners.

The situation is particularly pressing in Latin America, where the lack of adequate infrastructure is considered one of the main obstacles to achieving integration and the formation of an extended regional market capable of competing effectively with the rest of the world (Millán, 2007). In fact infrastructure bottlenecks not only hinder intra-regional trade, but deter the formation and functioning of international vertical production chains, negatively affecting countries' competitiveness. Greater cross border connectivity through national and trans-national infrastructure investment projects is urgently needed.

Regional cooperation in Latin America has advanced since the launching of IIRSA, the Initiative for the Integration of Regional Infrastructure in South America in 2000. The initiative, funded primarily by CAF, the Financial Fund for the Development of the River Plata Basin and the IADB, seeks to promote the region's competitiveness and a sustainable socioeconomic development through cooperative modernization and integration of infrastructure. IIRSA recognizes that to achieve this goal infrastructure, and transportation in particular, must be approached in an integrated fashion. This means that beyond physical investment, improvements must be achieved in logistics, including border crossing facilitation and regulatory frameworks.

IIRSA has allowed for important advances in regional integration in South America. Progress has been made with respect to strategic planning, within the framework of IIRSA development axes, and the identification of infrastructure projects within these axes – many matched with corresponding financing.

Regional cooperation is necessary also to help pool financial resources and channel them towards high quality regional infrastructure projects. In this respect the use of innovative financial instruments has shown promise. For example, in the construction of the Corredor Vial Interoceánica Sur, a key IIRSA project linking port cities in Peru with Brazil's Federal Road system, financing is secured through the issue of Certificates of Recognition of Investment Works Payments (known as CRPAOs for its Spanish acronym). Through CRPAOs the public sector commits to an annual payment as compensation for works completed according to contract. This way, investors are isolated from project risk during both construction and operation. CRPAOs are discussed in more detail in Box 2.

## **BOX 2: The Corredor Vial Interoceanica Sur and its pioneering financing structure**

The Corredor Vial Interoceanica Sur is a road that spans the southern region of Peru, Bolivia and Northwestern Brazil. In Peru, more than 2,600 km will connect port cities with Brazil.

The construction of the Interoceanica, divided into 5 individually financed segments, has been characterized by an innovative financing mechanism, based on the issue of Certificates of Recognition of Investment Works Payments (CRPAOs for its Spanish acronym). In this PPP structure, the government is obliged to pay concessionaries for work advancements completed according to contract. The CRPAO is used as a way to represent such payment obligation. The value added of CRPAOs are that they are irrevocable, unconditional, dollar-denominated payment obligation certificates issued by the government of Peru through the Ministry of Transportation and Communications, guaranteeing a constant annual (or semi annual) payment as compensation for investment works completed according to contract. CRPAOs are freely transferable and, once generated, are not subject to any condition or performance obligation under the concession agreement. Finally, CRPAOs are subject to the laws and courts of the State of New York. Therefore, CRPAOs can be used as value-titles for the structuring of a financing package for the without formal government guarantees.

CRPAOs, although not part of public debt, are backed by the full credibility of the government of Peru. All CRPAOs are *pari passu*. Therefore, by law, the Peruvian government cannot discriminate and decide to pay the CRPAO on one concession over another one, for example because at the moment the former is more politically attractive or visible. The only way to actually default on a CRPAO would entail abandoning the entire concession and infrastructure program.

The financing of Interoceanica is notable under several aspects. First, the use of the CRPAO feature, limiting investor risk, which is considered a state of the art structure in infrastructure financing. Second, the Interoceanica is one of the longest maturity project financings in Peru, and one of the few Latin American PPPs to successfully close in international capital markets. Furthermore, the financing structure designed for this project made it possible to start construction works within six months of the concession award, and complete the full private sector financing for all three stages of investment within 18 months.

Source: based on Wulff (2007) and Fitch (2007).

Multilateral banks and regional institutions have an important, and multi-faceted, role to play in regional infrastructure cooperation. First, they provide capital directly and help mobilize resources from other sources, such as the private sector, for example through the use of guarantees and other risk mitigation instruments that facilitate the lowering of project risk premiums. Second, they provide technical support and expert advice, which includes monitoring and aiding national regulatory reforms key to attracting private investments, and aiding in formulating projects so as to increase their appeal to capital markets. Finally, multilateral institutions can play a catalytic role in cross-border infrastructure projects, facilitating the interaction of different stakeholders in the planning and implementation stages (Kuroda *et al.*, 2007).

Most cross-border infrastructure projects tend to be planned and designed on a bilateral basis. This project specific approach can involve high transaction costs, high failure rates and long lead times (Kuroda *et al.*, 2007). To jumpstart the region's process of physical integration, and facilitate the execution of trans-national projects, a regional infrastructure agreement would be recommended to ensure credible commitment among national administrations. Governments in the region should integrate trans-national infrastructure programs into their countries' own development plans, and establish institutional arrangements that can support the technical, legal and regulatory coordination necessary for regional infrastructure projects. Such a demonstration of strong political commitment to regional infrastructure coordination can also help reduce overall external risks.

## VI. Concluding Remarks

An assessment of the condition of infrastructure in Latin America, coupled with evidence that points to infrastructure's fundamental role in growth, underlines the need for greater investment in the region. In Latin America, investment in infrastructure has been restricted by many factors, including limited domestic ability to carry out projects, credit constraints due to both external constraints and country specific inability to raise capital, and reduced investor interest in infrastructure projects tied to high perceived political risk.

In the last two decades, governments in the region have turned to private participation as an answer to infrastructure investment needs, but results have been mixed, and public perception has soured. Public investment must increase, but investment needs remain beyond its capability if fiscal sustainability is to be preserved. Private participation will continue to be required; what is important is to learn from past experiences to maximize the benefits of such private involvement.

The government's role in infrastructure is not limited to that of financier, but includes that of monitor, regulator and enabler. In this sense, governments in the region face the challenge of not only increasing infrastructure financing, but of creating the necessary conditions to promote and retain quality investment in the sector. In particular, governments must dedicate themselves to establishing the necessary juridical and regulatory framework to promote credibility and security in the sector.

New PPPs must be contracted taking advantage of lessons from the past. Many negative experiences with PPPs were tied to badly structured contracts within weak regulatory frameworks. A combination of unbalanced risk allocation, inadequate economic forecasts (especially with respect to expected income streams) and weak institutions contributed to public disappointment with private participation and an excessive amount of contract renegotiations. This past experience points to the need for a better risk distribution mechanisms between parties, taking account of the fact that risks should be taken on by the party that has the most control over such risk. Furthermore, civil participation should be included from the initial phases of the project, to ensure that the benefits of the project are allocated in a socially desirable way. Lastly, a strong regulatory framework has been demonstrated to play a key role in successful PPPs. While it is not always possible to complete regulatory reform first, governments should commit to an ongoing effort towards an improved regulatory framework.

The investment needs of the infrastructure sector in Latin America are such that countries in the region must continue to explore new sources of financing. Improving access to international capital markets and tapping into local markets are two areas where increased financing can be activated. Once again, governments play a key role in creating the appropriate environment to increase the attractiveness of investment and the necessary institutional framework to promote security and credibility.

Finally, infrastructure is closely linked to regional integration. On the one hand adequate infrastructure promotes deeper integration through the increased and more fluid movement of goods, services and people. On the other, many infrastructure projects are cross-border, requiring the commitment of more than one country. Regional cooperation in infrastructure investment, by internalizing spillovers and taking advantage of economies of scale, plays an important role in regional infrastructure development, ultimately promoting greater and deeper regional integration and faster growth among the region's countries.

### **Issues for Discussion**

- 1) Public-private partnerships (PPPs) can play an important role in infrastructure development, bringing not only much needed funding but technological know-how, managerial efficiency and entrepreneurial spirit. But private investment is neither the silver bullet nor a blanket solution to the sector's needs. And mixed results of private participation in the region in the past have created a certain backlash. What lessons have been learnt from past experiences of private sector participation in the sector? How can new PPPs be structured to allow the potential benefits of such associations to be fully realized? What alternative sources of funding are available, and which should be more explored and developed?
- 2) One of the lessons that emerge from past experiences of private participation in infrastructure is the need for the public sector to continue to be a main player in this sector. The role of government in infrastructure is not limited to that of financier, but includes that of monitor, regulator and enabler. Governments in the region therefore face an important challenge in creating the necessary conditions to promote and retain quality investment in the sector, and to maximize the social and economic benefits associated with infrastructure development. Which are the most important reforms necessary to improve the outcomes of PPPs in the sector?
- 3) Multilaterals play a key role in infrastructure development in the region: not only do they provide capital directly, but they play a catalytic role by providing guarantees and other risk mitigation mechanisms, and contribute technical and expert advice. In particular, multilaterals - such as CAF - have been active in developing innovative financing mechanisms within PPPs. What more can multilaterals do to promote infrastructure development in the region, and to facilitate PPPs in particular?

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