

# Financing of infrastructures in Latin America



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## Network Industries Quarterly - Vol 18 - No 1 (Spring, 2016) - Achievements and current challenges regarding public utilities' regulation in Brazil

This Evidence exists that investment in infrastructure contributes to growth, by increasing productivity, reducing production costs, and facilitating the accumulation of human capital. However, despite the evidence of the positive impact of infrastructure on growth, according to the World Bank, the Gross capital formation (% of DGP) in Latin American Countries (LAC's) was 21.4% in 2014, while in fast-growing economies, such as China and India, it was 46.2 and 31.6%, respectively. Besides, according to the Interamerican Development Bank, the total investment in infrastructure in LAC's has been fallen since the late 1980s.

As a response to the gradual decline in investment, LAC's have been implementing structural reforms aimed at increasing productivity, in some cases through investment in infrastructure. However, unfavorable international economic conditions have made this a difficult process. Public investment alone has proved to be insufficient in increasing the stock and quality of infrastructure to acceptable levels. As a consequence, in LAC's, it is essential to increase private participation to finance infrastructure. LAC's need a stronger regulatory framework, where institutional investors, such as pension and mutual funds, can increase their capital allocations in infrastructure, for example through schemes such as Public Private Partnerships (PPPs), without increasing their risk exposure.

The goal of this issue of the Network Industries Quarterly is to identify the conditions for the capital and money markets to increase their participation in the infrastructure financing process. Furthermore, the chapters illustrate examples of different forms of infrastructure financing. The first article by Jorge Alcaraz and Adriana Castro provides an overview on foreign direct investment as a source for infrastructure building, focusing on how governments from Latin American countries could improve the effects of these investments. The second article by Francisco Javier Valderrey and Miguel Ángel Montoya presents an overview of Chinese investments in Latin America and the challenges and consequences of this. In the third article Luis Arturo Bernal Ponce and Ricardo Pérez Navarro analyse the effect of public and private investment in infrastructure on economic growth in emerging countries, using Mexico from 2006 to 2016 as the case study. Brazil is instead the case study used by Joisa Dutra and Vivian Figer to shade lights on the future of electric utilities in Latin America. Finally, the article by Irina Alberro and Doreen Vorndran presents an innovative mechanism of financing social development: Social Impact Bonds have received attention across the world and in Mexico to address the challenges that youth faces.

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# Foreign direct investment as an alternative for infrastructure building in Latin America

Jorge Alcaraz\*, Adriana Castro\*\*

Abstract - In this research we study the FDI impact on infrastructure and propose how governments from Latin American countries can improve the effects that this investment has in home infrastructure.

## Introduction

The foreign direct investment (FDI) is understood as the Multinational Enterprises (MNE) mechanism of expansion abroad and the mechanism to enter overseas countries. During the last decades the empirical study of the inward foreign direct investment has shown its impact on host countries, in particular in those countries with less economic development, the emerging countries. The FDI issued by a MNE could have direct as well as indirect effects on the host countries. The effect on Infrastructure is considered as a direct effect.

The subject of infrastructure related with the foreign direct investment has been studied in two different ways. In the first one, infrastructure is seen as a driver for MNE allocation. In the second one, the infrastructure is seen as part of the positive impacts that inward FDI has on home countries. Nevertheless this latest approach has not been broadly studied, yet during recent times the understanding of this phenomena has been taking more relevance (Donaubauer, Meyer, & Nunnenkamp, 2016; Germaschewski, Forthcoming; Sawant, 2010).

In this research we focus on this last perspective, when MNE address their investments to host economies and how they contribute to the host country infrastructure development; in general in emerging economies but particularly in Latin American countries. It is also discussed which role the government has in the promotion and how it contributes to the domestic infrastructure improvement through foreign private capitals.

## Multinational enterprises and host country infrastructure

The FDI and the impact that it has in developing and developed countries has been broadly studied. In the

case of developing economies, in theoretical and empirical terms inward FDI brings direct and indirect benefits to the host country. This investment is considered as an external source of capitals and can contribute to the gross capital formation in the host economy, it can improve the transfer of technology and some other spillovers (Cheng & Yan, 2003) like new jobs, management and marketing skills, improvement of productivity and competitiveness that can lead to the economic growth of the host economy.

Infrastructure is an important part to focus on when talking about inward FDI. And given the lack of resources in emerging economies and making particular reference to those from Latin America in comparison with developed countries and also other Asian emerging economies, the topic becomes relevant. Even more given the role that infrastructure development has on economic growth. Actually there is empirical evidence that clearly has identified the straight impact that infrastructure has on economic development in other emerging economies like China or India (Sahoo & Dash, 2009).

In this regard, public and private investment for infrastructure development results highly relevant. Foreign direct investment contributes to offset and in a certain extent to overcome the lacks that home governments have related to infrastructure. And here lies the role of the FDI as an alternative to the infrastructure improvement in the Latin American countries. Foreign multinational enterprises can bring to these countries infrastructure services such as transport facilities, telecommunications, water and waste treatment, electricity, airport terminals, roads, railways, to name a few. Frequently governments from Latin American countries do not have enough budget to spend in such infrastructures and often they are inefficient (Sader, 2000).

During the 90s, Latin American countries received considerable amounts of FDI addressed to infrastructure related with public good services. These foreign capitals were mainly due to privatizations that were a common practice

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during the period (Sader, 2000). Multinational enterprises have entered to this region in various ways like greenfield, mergers and acquisitions and joint ventures. However, greenfields have not been a highly popular entry mode in comparison to mergers and acquisitions. This fact restricts to an extent the positive direct effects that foreign capitals could bring to the countries since greenfield investments have better overcomes than merger and acquisitions (Wang & Wong, 2009).

The challenge is to maintain and improve the inward investment trends that got into Latin American countries during the 90s and furthermore keep it sustainable. Nevertheless this is not an easy task, when, generally speaking, emerging economies have weaker institutions and a politically unstable milieu, situations which are reflected in riskier transactions for multinational enterprises, in comparison with developed countries. Even more when industry risk is higher for infrastructure than in manufactures (Ramamurti & Doh, 2004).

### Home governments and infrastructure development

The participation of the home government is fundamental regarding the FDI. It can make the national conditions both tangible and intangible for the attraction of foreign capitals but it can also increase the positive effects of those investments in the host economy. In this section we are going to check how the host government can contribute to the improvement of national infrastructure in Latin American countries by means of FDI. Furthermore it is possible that domestic investment abroad, or outward FDI, could contribute to the national infrastructure development, and in this second case, the home government is likewise essential.

One first step in this issue is that host governments create, develop and provide the conditions to promote the entrance of capitals from foreign enterprises (United Nations, 2003). It has to do with the liberalization process that most Latin American countries have conducted, stable policy frameworks, institutions, trade openness and generally speaking certainty to foreign firms to perform in the host country. Governments also have to address investments in order to improve their endowments since these investments are going to increase the attraction of Multinational firms (Donaubauer et al., 2016) either in terms of number of enterprises but also in amount of money.

The above constitutes the general conditions for the attraction of FDI. That is to say, those elements are key points for foreign firms' allocation. A second way to attract FDI

is through the investment promotion agencies that all countries in Latin America have. These investment promotion agencies can develop special plans and programs specifically oriented to attract investments to provide infrastructure to the recipient countries, particularly the infrastructure that the country lacks.

It is important that host governments make sure that foreign investments will produce benefits. This is relevant because there is also evidence pointing out that inward FDI is not always going to have positive effects (Kimura & Todo, 2010). In this sense, on the one hand, the selection of the accurate investment is going to play a fundamental role as well as government controls. On the other hand, and following the same line of the investment promotion agencies, these institutions give several incentives for the attraction of foreign enterprises, which by and large don't ask for any requirement to the MNE. The proposal here for Latin American countries is to condition the incentives that the country gives in return for the improvement of the host country's infrastructure. Furthermore, this last scheme could works either for investments dealing with infrastructure activities or investments for any other sector.

Another way how governments can promote infrastructure development relates to the promotion of the expansion of national enterprises through direct investment abroad. As the mechanism is the same this is, to some extent, similar to the previous case. The government can develop a framework along with home country measures to promote the internationalization of its own enterprises. The government can state the infrastructure as a strategic sector and in consequence it is going to provide support to those enterprises with direct positive effects in the home economy, including the remaining of the current activities instead of their relocation to other countries.

Home country measures for the promotion of national enterprises abroad is not new. Both developed and developing economies have been promoting domestic firms' expansions. In the case of Latin American countries, only Brazil, Chile and Mexico have some measures for that purpose. Perhaps it is not as popular as the programs for the attraction of FDI because the impacts to the country are not so clear and straightforward (Economou & Sauvart, 2013). However, the participation of the local institutions is fundamental to control and to make sure that potential benefits will have the expected effects, in this particular case, in the improvement of the infrastructure for the country.

There is one last proposal to improve infrastructure in the host economy through FDI. Given the financial lacks that countries from Latin American have, it has to do with mixed capitals. This mechanism is thought to solve the infrastructure problem with FDI through a joint

public-private partnership with domestic private firms (Germaschewski, Forthcoming). This is a new instrument to finance infrastructure in low-income economies, however, it could be helpful for emerging economies as well and specifically for countries from Latin America.

### Conclusion and challenges for the future

The inward FDI in emerging economies has resulted in positive effects on economic growth. In the case of the impact of the FDI on infrastructure the situation is similar. That is to say, foreign private capitals contribute to the improvement of infrastructure that emerging economies need due to their lack of resources. Latin American countries could improve their own conditions in terms of infrastructure considering for this aim inward FDI. This is more relevant when the development of infrastructure promotes the economic development in the host country.

In this research we have shown some ways in which governments from Latin American countries can improve the development of infrastructure through inward FDI but also with domestic direct investment abroad. More important is the role that governments play in making sure that the potential benefits for the country created by the multinational enterprises, foreign and domestic, are actually realized. Here a virtuous circle takes place: the better the host country's international conditions the more FDI it will receive. This inward FDI will improve the host country's infrastructure which will impact on its economic development, which, at the same time, becomes a driver for more foreign capitals allocation.

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# China to Finance Infrastructure in Latin America

Francisco Javier Valderrey\*, Miguel Ángel Montoya\*\*

Abstract - In this article we present an overview of Chinese investment in Latin America and a succinct analysis of the financial challenges and repercussions of infrastructure investment in the region.

## Introduction

In a world of shrinking opportunities investors face a pressing need to look for new alternatives. Latin America is eye catching, due to the lack of adequate infrastructure to sustain population growth, the rise of middle classes and the betterment of economic conditions, if considered in the long run. Infrastructure is widely recognized as necessary to carry the region into the developed world and opens enticing possibilities to local and international business people and enterprises. Nevertheless, infrastructure presents a gloomy panorama in Latin America, with profound differences on a per country basis, although some nations look attractive to international investors. Traditional problems of infrastructure investment, mainly commitment of massive resources, long term planning and capital allocation, or the need for a clear regulatory framework, acquire a multiplier effect in Latin America. During many decades the difficult role of providing for those services has been considered a state responsibility. Without a sizable input from the private sector<sup>1</sup>, governments have been unable to reach the yearly 5% of GDP of infrastructure investment, which many experts consider the threshold to reach development, when sustained over a long period of time.

On the positive side, the inclusion of some countries in global value chains and participation in free trade areas have fostered the construction of highways, sea ports, airports, railways and other elements to carry out the necessary logistics for international trade. Although advances in transportation may be more evident, numerous projects have successfully provided clean water, sewage or electricity to communities, thus fulfilling some of the Millennium Development Goals. The growth in telecommunications is noticeable and the energy sector has been the driver of

foreign direct investment (FDI) in major projects. In spite of those improvements, infrastructure investment in Latin America repeatedly falls below expectations. Therefore, it is evident the need for a game changer, which may have already arrived.

## A unique investor profile

Latin American economies were subordinated to European countries during early stages, although for more than a century the area has fallen under the umbrella of the United States. The presence of American investment is overwhelming, except for a handful of nations that ideologically oppose its dominance. Recently, though, China is rivalling the US in several industries and markets. The Asian country is getting closer to Latin America due to geopolitical reasons, market expansion, as well as for the need to secure agricultural commodities and raw materials for its industry.

At first, the relationship between China and Latin America was fundamentally based on trade. China exported low added value manufacturing products in exchange for commodities, leaving a rampant trade deficit on the reverse side, with negligible FDI involved. Recently, the situation started to change; a review of FDI inflows from China to Latin America between 2010 and 2013 reveals a dramatic increase in the Chinese direct presence in Brazil, Argentina and Peru, through investment in infrastructure, energy related and turnkey projects. Aggregate investment in the region reached US\$ 42,716 million between those three years, as opposed to US\$ 7,342 million during the entire preceding decade<sup>2</sup>. The year 2010, in fact, witnessed an inflow of US\$ 13 billion into the region, especially

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1 Serebrisky et al. propose different solutions for the chronic problem of underinvestment in infrastructure in Latin America and they make a major point at "treating infrastructure as an asset class in its own right, rather than a sub-class derived from real estate". (Serebrisky, Suárez-Alemán, Margot and Ramirez, 2015, p. 22).

2 Enrique Dussel Peters points at the fact that Chinese investment policy has evolved into regional agreements, although with focus on five key countries: Argentina, Brazil, Cuba, Mexico and Venezuela. (Dussel, 2015, p. 4).

through mergers and some large acquisitions in the oil industry. As pointed by the Economic Commission for Latin America and the Caribbean (ECLAC), investments included operations in different sectors, which caught “the attention of governments and civil society”, with unintended consequences in strategic sectors<sup>3</sup>.

The composition of Chinese outward direct investment is rapidly evolving and so are the main actors involved. Initially, State-Owned Enterprises (SOEs) were the investors, as part of the internationalization process of China. Large, but rather unknown companies in the West, selected projects of strategic importance for their government, with international policy prevailing over business decisions. Then, a new breed of enterprises of different sizes took the lead<sup>4</sup>, with near 25% of total non financial FDI. In both cases, the so called “quasi-governmental organizations” or institutions devoted to the promotion of exports and investments, such as China Development Bank, Export and Import Bank of China, among others, paved the road for the success abroad of both SOEs and privately owned enterprises<sup>5</sup>. The new China-CELAC Forum is expected to provide further support to Chinese companies by promoting the removal of barriers to doing business. A major turning point is the shift in the composition of China’s FDI in the region, from merger and acquisitions into greenfield projects; the numbers are astonishing, with approximately US\$ 10 billion in 2014 in greenfield FDI, following a US\$ 46 billion figure in 2013, including the colossal project for the construction of the Nicaragua Canal<sup>6</sup>. Last year’s numbers show a reversal of this trend, but the fact of the matter is that China is displaying the capabilities needed to pursue investment projects of greater size and different shape.

The size of Chinese FDI in Latin America is growing rapidly. There are severe limitations to obtain statistics on incoming FDI into the region, but the figure nears the US\$ 99 billion in 2014, although those numbers may change according to different sources. There are also changes in the making that will have an impact. In fact, different internal events in China have reshaped the relationship between this country and Latin America. Some of the factors, such as the so called “soft landing” of the economy, are beyond the government’s control; others are consequences of the restructuring of the national economy in an effort to become service oriented, while others are

part of new international policy. The GDP growth has been reduced significantly, with new targets within a range nearing 6.5% of annual growth and unprecedented latitude for deviations. Although such rate of growth is only achieved by few countries in the world, the impact from the economic slowdown has been great in domestic production. The effect has been also noticeable for commodities export oriented economies in Latin America. Demand for agricultural products, minerals and raw materials has not changed much in quantity, but the less favourable terms of trade have a great impact in those countries. Additionally, the overcapacity for construction materials and engineering services has forced China to extend infrastructure projects overseas.

### Financing infrastructure investments

The new China is gearing towards domestic consumption, but in the process requires downloading the idle capacity for infrastructure development in other markets. As part of the One Belt One Road (OBOR) and the First 21st Century Maritime Silk Road initiatives, the nation is bidding and financing infrastructure projects in a myriad of countries in Asia, Africa and now also in Europe. The call for globalization of Chinese enterprises, the “Going Out” strategy, has also strengthened the incentive for companies of all sizes to go international. Latin America is probably a temporary exception, although President Xi Jinping has already pledged US\$ 250 billion for direct investment in the region, with US\$ 20 billion committed to infrastructure.

China is, relatively speaking, a new banker in Latin America, but it is already filling up the void left by international and multilateral lenders. Infrastructure investment in Latin America is carried out by Chinese enterprises and entities in many different forms, although they “fall into three categories: a) FDI in infrastructure, b) engineering and construction contracts, and c) loans provided to countries, with loan financing as the most significant form” out of the three<sup>7</sup>. Foreign infrastructure investment comes mainly through direct acquisitions, while engineering and construction contracts are not so straightforward. Finally, loans to countries are widely used, but on a case by case basis and subordinated to geopolitical strategy.

3 By the end of 2011, Latin America accounted for 13% of the stock of China’s outward direct investment (ECLAC, 2013, p. 7).

4 Chinese investment is extending to private companies, which are offering diversity and technological content. (Niu, 2015, 43).

5 Another quasi governmental organization, China Council for the Promotion of International Trade (CCPIT), plays a fundamental role by maintaining a strong relationship with all the parties involved. CCPIT is at the middle ground of the “top-down” action from the government and the “bottom-up” action from enterprises. (Yang, Z., 2015, in Peters, E. D. and Armony, A. C., p. 74).

6 With the Nicaragua Canal, the distribution of sectoral greenfield FDI changed drastically and construction dwarfed activities, with 63% of the aggregate. (Ray and Gallagher, 2015, p. 12).

7 Bettina Gransow explains in full detail each category, with detailed data and figures of loans committed to countries and companies. (Gransow, B., 2015, in Peters, E. D. and Armony, A. C., p. 94).

Many experts anticipate a reduction in sovereign lending, counting on the new strategies that encourage enterprises to invest overseas. Their estimate is probably right in the long run, but for the moment there is room for surprises. In fact, by 2015 sovereign lending was increasing to US\$ 29 billion, “nearly twice as much as the combined of all the Western multilateral development banks, including The World Bank, The Inter-American Development Bank and The Latin-American Development Bank”<sup>8</sup>. Sovereign loans have served different sectorial needs, although in the last year, oil and gas and infrastructure have prevailed.

A report from the Inter-American Dialogue offers information in full detail about lending practices from Chinese financial institutions. Although it was published in 2012, provides the following lessons: a) generally, those loans are offered under China’s terms; b) often they are backed by commodities; c) typically, they are not tied to specific policy actions, although they come with some strings attached; d) it is customary to demand some reciprocity or a buy-back scheme of some goods or services<sup>9</sup> and, e) recently, loans include social and environmental guidelines<sup>10</sup>. The advice given at that particular time is still valid today, perhaps with the exception of the large greenfield projects, such as the Nicaragua Canal or the Twin Ocean Railway Route, connecting the Atlantic shores of Brazil with the Pacific Ocean. Those are far more complex scenarios, as seen in the project for construction of a high speed train connecting Mexico City and Queretaro, which was cancelled after the bid was won by a Chinese company. Additionally, there must be a better mutual understanding and good will, before undertaken similar large scale projects<sup>11</sup>.

There is a factor whose consequences are hard to predict: China’s efforts to place the Renminbi (Chinese Yuan), among the basket of strong currencies. The interest on the internationalization of the yuan ranges from national pride to practical reasons. The country has a strong desire to reach a position in the international financial arena more consistent with the status of global super power in the making. Furthermore, the national bank will gladly shift the immense amount of accumulated dollar reserves to other currencies and even issue yuan denominated bonds in international markets. At present, China is a large holder of US Treasury securities, competing with Japan for the top place, with well over one trillion dollars in bonds, notes and bills; this gives much power over the United States, but at the expense of high exposure and currency dependency.

Finally, there are other factors with full potential to impact the availability of financial resources from China. Firstly, the country has already committed more than a trillion dollars to OBOR. This is Xi Jinping’s preferred plan and if his prestige happens to be at risk, all the necessary resources will be shifted to the project. Secondly, China is facing increasing tensions in the South China Sea. Although a military conflict is not part of the foreseeable future, the pressure may result into a military build-up, draining available resources. Thirdly, there are some domestic issues, such as regional income redistribution, compensation to workers losing jobs by the millions in the restructuring process of obsolete SOEs, or shifting patterns of rural and urban migration. Any of those factors may result in deviation of resources that could otherwise go to Latin America.

### Final remarks

The presence of China in Latin America is growing solidly, with no indications for a slowdown. Granted, turmoil and the expected resurgence of some markets will shift the preference from country to country. The region desperately needs new business partners that may provide infrastructure investment and a wide range of financial tools to sustain it.

In 2014 China became also a net foreign investor, after years of being one of the leading recipients of FDI. The country is an international lender and perhaps the only one nowadays with the resources, the planning capabilities and momentum to carry out massive projects. Yet, those considerations are at the mercy of geopolitical strategies and the avid promotion of the renminbi as a strong international currency. There is one more caveat: presumably, Latin American governments will find increasingly hard to reach their traditional lender of last resort. For many years China has been handing out easy money for infrastructure projects to countries on the brink of collapse. Governments in precarious economic conditions gladly accepted loans with minor political and commercial strings attached, or backed by their own commodities, but such assistance will be limited in the future. In fact, many of the newcomers are private enterprises, with the same interest on making money as their local counterparts. Those companies will use hard bargaining as soon as they feel prepared to compete in global markets.

8 Rebecca Ray and al. also argue that “China has emerged as an important source of counter cyclical finance during times of regional economic contraction” in Latin America. (Ray, Gallagher, Sarmiento, 2016, p. 4).

9 According to the report, “China has used its loans-for-oil and purchase requirements to reduce the cost of lending to otherwise non-creditworthy borrowers”. (Gallagher, Koleski, 2012, p. 9).

10 The report by Ray and al. emphasizes the importance of community engagement, (Ray, R., Gallagher, K., Lopez, A., Sanborn, C. 2015, p. 15)

11 Ferchen anticipates a bumpy road for Chinese investment in Latin America (Ferchen, 2015, p. 1).



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# Effect of public-private infrastructure investment on economic growth

L. Arturo Bernal Ponce\*, Ricardo Pérez Navarro\*\*

Abstract - In this paper we analyze the effect of public and private infrastructure investment on economic growth from 2006 to 2016, using Mexico as the case study. We found a positive and significant effect, mainly in the private sector.

## Introduction

Evidence exists that investment in infrastructure contributes to growth. A vast literature has already addressed this relationship, but most of previous studies have obtained ambiguous rather than robust results, mainly because of the problems associated with the methodology used (Teles and Mussolini, 2012). As a result of that, this subject has been recently addressed from different methodologies in different geographical areas, mainly in emerging economies. For instance, in a recent work using India as the case study, Pradhan and Bagchi (2013) find a bidirectional causality between road transportation and economic growth, and a unidirectional causality from rail transportation to economic growth. That paper suggests that expansion of transport infrastructure (both road and rail) along with gross capital formation will lead to substantial growth of the Indian economy.

In the case of Asia, Pradhan, et al (2016) assess the causal relationship among telecommunications infrastructure, financial development, and economic growth in 21 Asian countries between 1991 and 2012. Their results reveal that there is a causality, in a Granger sense, among the variables, both in the short and long run. For the region of Africa, Donou-Adonsou and Mathey (2016), investigate the impact of telecommunications infrastructure in Sub-Saharan Africa, in a panel of 47 countries over the period 1993–2012. Their results show that the internet and mobile phones have contributed to economic growth. Also, their results suggest that the development of telecommunications infrastructure fosters economic growth in Sub-Saharan Africa.

For Latin America Countries (LACs), in the case of Peru, Urrunaga and Aparicio (2013) confirm that public-service infrastructures (roads, electricity and telecommunications) are important in explaining temporary diffe-

rences in regional output. Meanwhile, Teles and Mussolini (2012) analyze the relationship between infrastructure and total factor productivity in the four major Latin American economies: Argentina, Brazil, Chile, and Mexico, between 1950 and 2000. Even when they analyze the case of Mexico, as we do in this work, one main difference between that paper and ours, is that they analyze the indirect effect of infrastructure on output, via productivity, while we analyze the direct effect. Also, we use a more recent database from 2006 to 2016.

As we can see in this short, but recent literature review, still there is no recent literature that addresses the link between economic growth and infrastructure investment in some LACs, as it is the case in other geographical areas. Therefore, the purpose of this work is to contribute to the literature in this subject. In particular, what we want to address is the lack of public infrastructure investment in Mexico, compared with the private infrastructure investment. To achieve this, we analyze the long-run relationship between these two variables, through an econometric analysis, dividing public and private investment.

## Data and Methodology

In order to analyze the effect of infrastructure expenditure on economic growth, we use quarterly data from Mexico, from 2006 to 2016 (2006 is the year when the Mexican authorities began to account for infrastructure). We use information from the Mexican Institute of Statistics and Geography (Instituto Nacional de Estadística y Geografía). As a measure of economic growth, we use Gross Domestic Product (GDP). Also, we use the investments sectors that represent 85% of total investment in infrastructure in Mexico. These are: i) Building (Build), which includes investment in housing, industrial buildings, schools and

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hospitals; and ii) Telecommunications (Telc), which includes investment in works related to radio and television.

In this way, we establish the following function:

$$GDP = F( Build, Telc).$$

We expect a positive relationship of this function. It is important to separate public investment from private investment because, according to Zangouinezhad and Azar (2014), there is a debate in writings as to the correct definition, whether these two kinds of investments are substitutes or complementary. Given the above, we propose estimating three models.

a) Impact of private sector investment on infrastructure.

$$GDP_t = \alpha + \beta_1 Build_t + \beta_2 Telc_t + u_t.$$

b) Impact of public sector investment on infrastructure.

$$GDP_t = \zeta + \alpha_1 Build G_t + \alpha_2 Telc G_t + u_t.$$

c) Impact of public and private sectors investment on infrastructure.

$$GDP_t = \varphi + \lambda_1 Build_t + \lambda_2 Telc_t +$$

In order to calculate the impact in terms of elasticities, all variables are expressed at constant prices and logarithmic terms. It is also important to mention that in order to verify that the relationship we are analyzing is not spurious, we verify cointegration, through a cointegration test. For simplicity of the exposition, we do not show the results of these tests, but this condition is satisfied, in all cases, except for the infrastructure expenditure in public sector of telecommunications, and for this reason, we do not include it in the model “b”, nor in the model “c”. In the following Table 1, we show the results:

Method: OLS (Q1 2003 - Q1 2016)			
Dependent variable: Quarter GDP			
	Model a	model b	model c
Constant	12.57	14.7696*	12.2223
Build	0.2193*		0.1973*
Telc	0.0138**	0.1093*	0.0122**
Build G			0.0503*
The symbol * corresponds to coefficient of significance at 5%, ** to at 10%			
Source: Own estimations with data from INEGI			

First, the results in Table 1 confirm our hypothesis about a positive relationship between infrastructure investment and economic growth. Second, our interpretation of these results goes as follows: for every 1% of private sector investment in building (housing, industrial buildings, schools and hospitals), the Mexican GDP increases by approximately 0.2%. Also, for every 1% of private sector investment in telecommunications (radio and TV), the Mexican GDP increases by approximately 0.01%. On the other hand, for every 1% of public sector investment in building, the Mexican GDP increases by approximately 0.05% (taking model “c”). As we mention before, there is no a long-run relationship between public investment in telecommunications and economic growth.

From these results, we can conclude that private sector investment in infrastructure is driven, in a more significant way, by the Mexican economic growth, than by public investment. This result is important for policy makers, for at least two reasons: i) even when there is a positive relationship between infrastructure investment and economic growth, this link is not very significant, and more investment is required; ii) private investment results to be more effective to generate economic growth. Consequently, in order to increase private participation in investment in infrastructure in LAC through money and capital markets, it is necessary to create the institutional and market conditions. In order to do so, the LACs need a stronger regulatory framework, where institutional investors, such as pension and mutual funds, could increase their capital allocations in infrastructure, for example, through schemes such as Public Private Partnerships (PPPs), without increasing their exposure to risks.

## Conclusion

In this work, we analyze the effect of public investment and private investment on economic growth in the Mexican economy, from the period 2006 to 2016. In particular, we study building, and telecommunications infrastructure. First, as we expected, we find a positive effect of infrastructure investment on economic growth. Second, we find that private investment has a bigger impact on economic growth, than public investment. As an example, on average, for every 1 US dollar that the private sector invests in building infrastructure, the Mexican GDP increases by about 0.2 cents, while if the investment is public, GDP would increase by only 0.05 cents.

These results are important for policy makers, because they serve as evidence for the efficiency of the private sector in contributing to economic growth, through investment in infrastructure. One of the challenges to foster the *private*

infrastructure in LACs, are some obstacles in the financial markets, some of which are: high transactions costs, political and governance risks, and policy and regulatory barriers. Consequently, in order to increase private participation in infrastructure investment in LACs, through money and capital markets, it is necessary to create the institutional and market conditions.

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# The Future of Electric Utilities in Latin America

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Abstract - This article analyzes recent developments in rail regulation in Brazil. We focus on two aspects: first, on the implementation of open access, with vertical separation of train and infrastructure operations; second, on the Logistics Investment Program, originally launched in 2012.

## Introduction

Throughout the 1990's Latin American countries (LACs) undertook a series of reforms in the energy sector. In general, they were motivated by the poor performance of a public model where the State was the monopolist supplier of electricity services. The lack of separation between the roles of investor, policy maker, regulator and monopolist resulted in political abuse and poor performance of state-owned enterprises (SOEs), which accumulated huge financial deficits.

The reforms were sought to help reduce fiscal imbalances and improve efficiency through the opening for the private sector investments. However, years later the drop of private investment due to external shocks was exacerbated when government reaction to the shocks showed it lack of commitment and made the flaws in implementation due to lack of good institutional and economic governance obvious<sup>1</sup>.

Now, almost 30 years after the reforms were announced, LACs' growth in energy supply is still not expected to meet the rising demand according to the World Energy report<sup>2</sup>. Latin American countries are still dealing with institutional failures and lack of good governance. Infrastructure limitations (human rights and environmental concerns in Brazil and Argentina, domestic terrorism in Colombia are some examples for lower investments in infrastructure in LACs) and climate changes add to the scenario.

In Brazil, the recent ruling of a case that had been ongoing for the past three years has some of the features that exemplifies all those institutional weaknesses: after a 20% discount in tariffs mandated by a presidential decree (MP 579/2012), a severe drought led the govern-

ment to increase the operation of thermo electric plants to secure supply against the recommendation of the National System Operator (ONS). In order to avoid the unpopular increase in tariffs to consumers the government mandated costs to be shared among all suppliers in the system to incur in this cost. After three years of litigations and various injunctions to allocate the cost, the TRF-1 ruled for two associations of electricity producers (APINE and ABRAGEL).

## Setting the scene: the energy mix in Latin America and the role of the actors

Latin America's power matrix is dominated by hydropower, which generates around 65% of the total electricity. But in recent years the capacity of expansion of hydropower plants, especially with large reservoirs, has started to slip, as these infrastructures became less popular. Environmental and social concerns help explain this trend. Although some countries had turned to natural gas (Brazil, Mexico and Argentina), the supply is still lower than demand, and they have to import Liquefied Natural Gas (LNG), which have a volatile price and supply is uncertain (Bolivia) in the longer term. The institutional weakness is obviously common to the sector. In Brazil, the lack of coordination between state (in charge of distribution regulation) and federal regulatory bodies, coupled with a dominant position of a national oil company that is also a quasi-monopolist in the natural gas market, further inhibits investment in E&P of a resource that is crucial to assure security of supply in a context of increasing penetration of intermittent renewables.

The industry was established based on utilities as the main

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1 For more information see Millán (2006) and Balza, Gimenez and Mercado (2013).

2 World Energy Council (2013).



suppliers of electricity services to end users. However, technological innovation is enabling the creation and proliferation of a range of Distributed Energy Resources (DER) – distributed energy generation (DG), distributed energy storage (DS), electric vehicles (EV) and Demand Response (DR). New Information Communication Technologies (ICTs) increase the efficiency and precision on data collected on usage and operation of the whole power system, allowing for more sophisticated and effective Demand Response (DR) options. Innovation allows for multi-directional power flows across distribution networks, enabling the development of micro grids and on-site DG.

Distributed Energy Systems resulting from the combination of DERs and ICTs are expected to cause disruptive changes to the power industry (although it is still not clear which ones). For sure the decentralization that characterizes the higher penetration of DER is strike conflict with the economies of the scale inherent to the networks that are the essence of the development of the industry as we know it. Those changes, in turn, enable new business models, which will evolve alongside the adoption of new technologies. Regulatory and policy conditions, reshaping the energy sector landscape. These new business models, that mean the way through which investors recoup the invested resources, have to shelter a great degree of decentralization followed by the diffusion of DGs and DSs.

The technological innovation and diffusion of DERs bring new actors into the market. Each actor's part in the supply chain of electricity services will also change, especially those in the distribution and retail sectors, since consumers become increasingly able to store, produce, and sell energy. Some DESs may also be operated by traditional utilities. Other players may operate DESs, providing services to end users and/or other stakeholders. The traditional utility must also cope with the new changes in technology, regulation and markets. They face the challenge of transforming the threat posed by new DESs into an opportunity.

The executive power must play an active (leadership) role in orchestrating the interaction of multiple government agencies from all spheres and various sectors to delineate an energy policy embedded in clear policy goals. In this regard energy policy must be aligned with environmental, tax, land use, transport, social and other policies. The rules that will be set within this context must acknowledge all stakeholders as strategic players. The challenge is exacerbated by the pace in which technology innovation is taking place and the whole energy system is endogenously changing. A dynamic framework for assessing priorities and recommendations, and acting on them to provide a sound regulatory and competitive environment must be drawn.

As DER penetrate the network and (traditional) end-users are endowed with the ability to control their consumption and become suppliers to the utilities. The latter however are still responsible to maintain reliability of supply and provide the network structure for the system, with an increase in the operation complexity.

### **The potential for innovation: the role of regulators and policy makers**

This points to the need to revisit the compensation patterns, changing from an approach in which the compensation is related to the electricity flow through the network to another that values the security of supply (a form of insurance) provided by the condition of remaining connected.

It is imperative that regulators are prepared for the transformative changes to come. It is policy-makers role to provide a set of incentive compatible rules so that new business models that create the most value may succeed. The traditional tariff design (volumetric basis) no longer reflects the incurred cost of each player and should be designed to promote the correct price signals and cost-recovery mechanisms. The traditional toolkit from regulators developed in the 20th century is not able to align incentives in an environment in which resources are valuable and must be consumed wisely.

Regulators need to allow revenues of electric distribution utilities to align with incentives for the integration of DERs and DESs. Put it “simply”, get (and allow for) the prices right. The correct allocation of costs is one of the main challenges in regulated environments, and becomes more complex in a dynamic setting.

In addition to the traditional long term approach and decisions required in this industry, the potential impact of new technologies may also have longer-term effects. Reforms must result from an integrated view of short, intermediate, and long-term objectives involving various actors and sectors. It is important that contracts are enforceable. When institutions are not strong enough the government must find a way to assure time consistency.

Policy makers must then seek to set dynamic rules so that utilities and other stakeholders can succeed in its market (re)positioning, benefiting all stakeholders and promoting the continuously sustained development of the energy sector. Up to recently regulators had to keep pace with some technological changes providing incentives for economic efficiency in a more static environment, where the role of the utilities was clearly defined and fixed. They could be

responsive to those changes.

The innovations taking place pose a greater challenge to regulators, since they may cause profound changes in an unknown pace in which the new business models that will arise are still uncertain. And more importantly, they are a function of the incentives and signals that regulators will provide. It is clear that the equilibrium that will emerge from the strategic interaction of all players will depend on the nature and amount of uncertainty of the system. Political and economic stability and reliability of the judicial system are essential to reduce the amount of uncertainty and effectiveness of an energy policy.

Whereas in developed countries all those changes occur and are thought within a solid institutional environment, in Latin America the challenge is to harness the technological innovations and review the whole regulatory and energy policy within a scenario of higher political, economic and judicial instability, which brings higher uncertainty for all players. Although this fragility of the overall environment poses a threat to a successful comprehensive reform, the need to adapt to all the changes in course is urgent. After the failure to construct new hydroelectric plants following environmental protests and lack of investments in addition to climate changes that exposed that deliverability is no longer secured the need for integrating new renewable sources became eminent.

Non-Conventional Renewable Energy (NCRE) is expected to play a more prominent role in the proliferation of DESs in Latin America. Solar, wind and biomass output and the hydro resource complement to each other seasonally, conditioned by the region in LACs<sup>3</sup>. Those complementarities reduce the impact of their intermittent characteristic. Note that an efficient development and adoption of NCREs should take into account the availability of those resources within the region and the complementarity between them. The decrease in levelized costs of renewables, specially wind and solar energy will also help fostering the propagation of NCRE<sup>4</sup>. Given these clear positive conditions, regulation must also adapt to allow investments in a cleaner renewable generation mix.

Until recently, the integration of intermittent resources in Latin America (mainly wind and solar) didn't bring much complexity for the operation of the system, given the storage capacity of its hydro plants. However, the difficulties in building new hydro plants with storage capacity associated with climate changes (El Niño/La Niña) had reduced the supply reliability of the system (such as the severe droughts in 2001) and this is likely to boost the adoption of new DERs. The increase of the share of NCRE associated with reduced storage capacity of the system will

increase the complexity of operation. Smart grids are technical resources that may help utilities and other operators to adapt to the penetration of NCRE. A well-design regulation is crucial to encourage the adoption of new technologies and the construction of smart grids. Developed countries that have a capacity-constrained power system can provide important lessons.

Recent regulatory trends are evidence of incentives to a higher penetration of DG. The Brazilian electric energy regulatory agency (ANEEL) had first established general guidelines for the adoption and DEG, defining pricing and access rules (RN482/2012). Upon its adoption, RN482 was followed-up and further improved culminating in the approval of resolution 687 in 2015.

The distribution companies are responsible for granting access (given the rules defined by RN482/2012 and 687/2015), for gathering the data, and installing and maintaining the meters (minigrids connection costs are incurred by the end-user(s) of the electricity service). A positive difference between energy generated and consumed can be credited to abate consumption in the following two months. There is a very important incentive implicit in this rule; consumers are paid almost the full retail price (in present value) for the energy exported into the system, which distorts price signals, creating cross-subsidies in favor of users of the grids, among other negative effects of price distortions<sup>5</sup>. The same rules for billing remote usage (virtual net metering) of the grids further exacerbate the distortions (there are different taxes and subsidies in different regions).

The huge volumes of data that can potentially be collected with the adoption of ICTs can increase information flows and prepare the system for adopting a range of demand response options. The combination of DR with ICTs will provide incentives for voluntary rationing if more granular prices are set and consumers are able and encouraged to use the information and make smart decisions about their energy consumption. However, consumer engagement will still be a theoretical assumption if the problem of electricity loss is not addressed in LACs. According to an IDB study, electricity losses in LACs were 17% in 2007-2011 compared to 6 and 8 percent in high-income countries of the OECD. The lack of a systematic monitoring in these countries is also a threat for efficiency and financial sustainability of the power sector .

## Conclusion

The complex interaction of various strategic players in a

<sup>3</sup> For more information see Batlle (2014).

<sup>4</sup> IRENA.

<sup>5</sup> For more information see Brown and Bunyan (2014).

complex system as the electric networks associated with the additional uncertainty regarding how the ICTs and DERs will evolve together with the new business models requires an immense effort. It challenges the executive office as the leader of an integrated task force that must work together and aligned in defining policy goals and strategies. In addition to stakeholders, academia and think tanks must engage to provide valuable inputs in designing an optimal policy scheme.

It may sound unrealistic at a first glance that Latin American countries should set as a priority for the energy sector to level the playing field for the adoption of ICTs and DERs that will increase the operation complexity in a region that is already coping to provide the right signals and incentives for stakeholders in a static environment. However, the urgency for a novel institutional approach to address climate change, security in supply and lack of investments is an opportunity for the countries, since they already need a comprehensive assessment of the current Energy System in Latin America's countries. And that is the starting point of any reform set to succeed.

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# Social Impact Bonds for Youth Employment in Morelia, Mexico: A New Approach to an Old Problem

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Abstract - Social Impact Bonds have received attention across the world and in Mexico. In order to address the challenges that youth faces, the municipality of Morelia has decided to explore this innovative mechanism of financing social development.

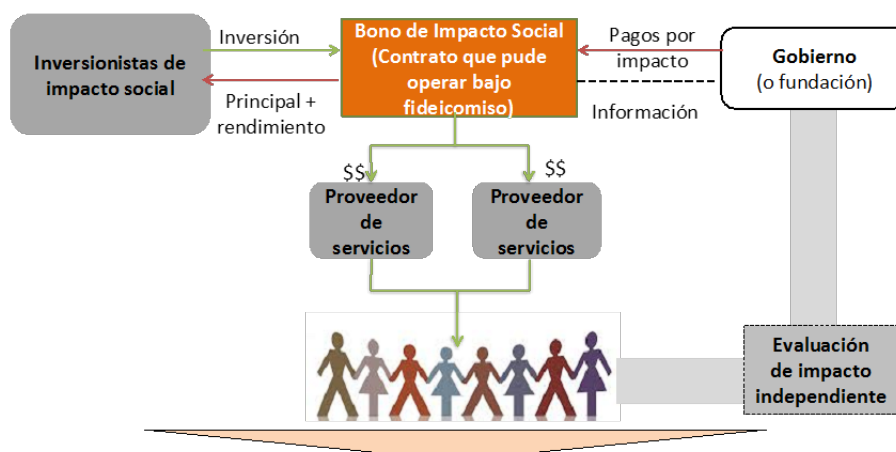
## What is a Social Impact Bond (SIB)?

Social Impact Bonds are financial instruments that involve an association in which foundations and impact investors assume the risk to finance a solution to a social problem (Levey, et al. 2015). In that sense, the Government does not assume the risk of proving a new policy and only pays for success. The British organization Social Finance implemented the first SIB in 2010 to work with Young offenders coming out of prison in order to achieve their social reintegration. That SIB turned out to be very successful given that it reduced reincidence and it implied savings for the British government. The savings allowed the British government to pay the principal to investor plus a return on investment. SIBs are important financial innovation tools to the international aid system and development, because they seek to reward successful social in-

terventions (Pay for Results) and consequently encourage public and private money used for social improvement of the community to be used effectively and efficiently.

A basic model for a SIB implies that the government hires the provision of social services through a private sector intermediary. The government makes payments to investors according to the achievements. An independent evaluator measures achievements using rigorous methodologies. If the intermediary fails to achieve the minimum target the government does not make the agreed payment.

The broker obtains funds to finance operating costs through private investment funds, foundations and non-governmental organizations, which provide capital upfront in exchange for a percentage of the payments that the government will make. Similarly, the broker uses these



- Si la(s) meta(s) acordadas se cumplen, los inversionistas reciben el principal invertido más un retorno a la inversión
- Se están desarrollando más de 80 BIS a nivel mundial y Jalisco podría ser pionero en México y en América Latina en el uso de BIS

Figure 1: Operational Scheme of SIB  
Source: Prepared with data from FOMIN and SF

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funds to hire service providers to deliver the interventions required to meet performance goals (Azemati, et al., 2013). It is then expected that the SIB will lead to a more efficient investment of public resources and contribute to improvements in the living conditions of the group targeted for the intervention.

### When is it worth using a Social Impact Bond?

It is important to analyze when a SIB is worth implementing; the structure involved in a SIB is highly complex and thus should be used when the situation really requires it. For instance, a SIB can be considered when the prevailing policy has important constraints and does not achieve its' purpose and is expensive compared to other possible options. It is also worth exploring a SIB whenever there are policy alternatives offered by non-governmental actors and with proven results. In most cases these Payments for Success (PFS) interventions cannot scale-up due to the operator's lack of resources and thus bringing investors to the table can prove very effective.

What makes recent PFS initiatives distinctive is that they are focused not simply on creating additional financial incentives for contractors to produce better outcomes, but more broadly on overcoming the wide set of barriers that are hindering the pace of social innovation. For sure, these barriers include a lack of performance focus and outcome measurement, but they also include political constraints that prevent government from investing in prevention, the inability of nonprofits to access the capital needed to expand operations, and insufficient capacity to develop rapid and rigorous evidence about what works. In some of these new models, the amount of performance risk shifted from taxpayers to those on the hook for producing the outcomes is much greater than under traditional performance contracts, requiring the participation of socially-minded investors to make the projects feasible (Azemati et al.)

### When is a Social Impact Bond feasible?

There are several criteria that have to be met in order to determine if a SIB is feasible:

1) **Clearly identifiable and traceable beneficiaries for the intervention.** The targeted population has to be identifiable along the whole program, which can in many cases last for several years. It is fundamental to be able to evaluate the beneficiaries' conditions and the performance of the program throughout the years.

2) **Robust measurable results metrics.** A rigorous impact evaluation is very important in these cases given that it defines payments from governments to investors and determines what success looks like.

3) **Programs with rigorous impact evaluation.** Providers of social services should have evaluations about their interventions and prove successful results. In that area that are still a lot of work to be done to professionalize non-governmental-organizations that are not accustomed to this kind of requirements.

4) **Priority topic for investors.** In order to be able to obtain the initial investment, the problem that the SIB wishes to address has to be considered as a priority for the social the impact investor community, as well as other more traditional financial entities.

5) **Priority topic for governments.** Governments need to be involved to increase the probability of success of a SIB so it becomes vital for the bond that the problem to be tackled is considered relevant and significant.

6) **Effective cost benefit program.** SIBs need to imply savings for governments and ultimately taxpayers. The idea is to have a better, proven and cheaper intervention. The returns to investors will then come from the savings that the bond has allowed. In many situations the business case for the SIB can address preventive actions, rather than remedial.

### The evidence of employability Bonds

More than 10 SIB on employment for Young people in the world have taken place, mainly in the UK. One of the most successful SIBs took place in London to address young people with high risk of unemployment and school dropout. An investment of £900,000 targeted 950 young persons. The SIB began in January 2012 with a 3-year duration and a return on annual investment of 3% at the end of the program.

The department of work and pensions developed proxy metrics to measure the increase and sustainability of future employment. Metrics included attendance and school performance, behavioral changes, improvement in abilities, learning of skills and employment. The Department of work and pensions established payments for each percent increase obtained and declared at the end of the project that they had saved £40,000 per student.

Overall the results were quite successful. Among them, 91% of the young that participated in the program have



a job or are in an employment training, 85% improved their behavior and scholar attendance, 72% reached good grades in standardized tests, 21% obtained a job through the organization ThinkForward who was in charge of the intervention and finally 24% got admitted to higher education.

**The issue in Morelia and the case for a SIB**

The city of Morelia is the capital of Michoacán, a federal state of Mexico which has been in the international headlines because of the problems of organized crime and violence for the last 15 years: Human heads dumped at public places, grenade attacks, armed self-defense groups claiming to liberate their communities from organized crime, public video revelations about the infiltration of organized crime in the local public administration. Meanwhile atrocities of executions, murder, kidnappings and forced disappearances of persons continue.

In response to the unfolding security crisis, the federal government in coordination with the military set up a special commission which has coordinated police operations and social and economic programs throughout Michoacán with considerate progress. These efforts contributed to the significant decline of the intentional homicide rate in Morelia, Michoacán’s capital which dropped from 27.3 per 100,000 inhabitants in 2013 to 19.8 in 2015 .

Other incidences of violence and crime have also been in decline. According to the Consejo Ciudadano de Seguridad Pública y Justicia Penal, in 2012 Morelia was leading national crime statistics on extortion and kidnapping. Three years later, it appears that Morelia is recovering from those situations (Figure 2).

Figure 2: Crime reports in Morelia (2000 – 2015)

	2000	2006	2013	2015
Crime reported to the authority	8,376	12,076	13,662	10,676
Burglary and robbery	3,468	6,634	7,910	6,116
Injuries	1,350	1,210	1,150	1,364
Intentional homicide	33	77	199	152
Extortion	25	25	85	6
Kidnapping	17	54	96	7

Source: Elaborated with data of Morelia Como Vamos and Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública (2016)

According to official data, the most affected population group by the violence has been young men between 15 to 39 years old. Over the past 10 years, an average of 34.7% of young men between 15 to 29 years were deprived of

their life by homicide (Figure 3).



Figure 3: Homicide registered in Morelia (2005-2015)

Source: Prepared with data for INEGI (2016)

Besides the public safety crisis, Morelia has undergone significant urban governance transformations and has faced economic development setbacks, which have especially impacted its youth. Between 1975 until 2000 the surface of the city has been growing 91.6% (Alvarez 2011). The population has been doubled from 353,055 in 1980 to 729,279 in 2010 (INEGI 1980, 2010). The age group of 15 to 29 years old has increased about 35.2% over the past 25 years. This added social and economic pressure on the city.

From 2002 to 2013 Morelia suffered a severe economic downturn which has impacted in employment opportunities and the business community. Based on Mexican Statistics Office’ macroeconomic data, the total value added of Morelia’s economy crashed from 29 billion pesos in 2003 to 14.22 billion pesos in 2011. With regard to the labor market, only 51.4% of the economically active people has a formal fulltime job. The unemployment rate increased from 4.2% (2005) to 5.19% (2016) (INEGI, 2016). According to national estimations by INEGI, the unemployment rate of youth between 15 and 19 years and those between 20 to 24 years has been around 8.6% and 8.3%, respectively. INEGI also estimates that 68.1% of the young people in Mexico works in the informal sector – exposed to minimum wages, lack of social security and labor exploitation.

Besides all those vulnerabilities, we identified in a recent study that youth of Morelia is eager to have their own commercial ventures. 8 in 10 young people would like to have their own business in the future. They consider that they have the ideas and skills to do so. We also asked for the motives of starting their own business. On one hand they referred to the necessity of an extra income and difficulties to find a job. On the other hand they emphasize their need to be independent and search for opportunities to apply

their skills and knowledge. With regard to their vocational orientation, more than 23.1% of the interviewed young people would like to be a trained professional with an undergraduate degree (Vorndran, 2016).

## Outlook

The Mayor of Morelia, Alfonso Martínez Alcazar, has set out employment and young people as a priority of its administration. Aware of the federal, state and local budget restraints he has approached national experts and Tec de Monterrey's School of Government to explore new mechanisms of financing social development based on concrete results. After an initial capacity building of his cabinet members about SIB and analyzing its pros and cons, his administration decided to proceed with the development of an initial concept about youth and employment in order to study the feasibility of an SIB.

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## Management of Urban Infrastructures *A Massive Open Online Course by EPFL - MIR - IGLUS*

In recent years, online courses have emerged as a game changer in the educational landscape. Massive Open Online Courses (MOOCs), covering a wide variety of subject matters, are now available to practitioners, as well as academics, and continue to attract increasingly large audiences via online education platforms such as Coursera and EdX. These online courses enable learners to choose from a diverse array of subjects and to freely explore those that are most interesting to them at their own pace. The combination of the flexibility associated with online education and the high quality of courses offered by world-class universities, have turned MOOCs into an appealing learning reference for many. As a result, these courses have become particularly invaluable to those practitioners who have limited time and tight schedules restricting them from attending conventional training programs, but still feel the need to stay up to date with the cutting edge knowledge in their fields.

As of February 2016, the Chair Management of Network Industries (MIR), is offering a free online course on the [Management of Urban Infrastructures](#) as one of the products of a global action research initiative relating to the Innovative Governance of Large Urban Systems, called [IGLUS](#). This free, and on-demand, course covers the basic principles of the management of urban Infrastructures and illustrates these principles through a deeper investigation of two of the most important urban infrastructures- the urban energy and transportation sectors.

In this online course we, at EPFL, have worked with a series of our partners in the [IGLUS project](#), namely the World Bank, The Veolia Environment group, Swiss Post, City-Canton of Geneva, Boston Consulting Group, and City University of New York. By providing a combination of inputs from both academia and industry experts, we have tried to give a balanced overview of the basic principles of urban infrastructure management and to also illustrate how practitioners make use of these principles in the real-world.

In less than 2 months, about 4000 learners had enrolled in the course and the feedback from this large audience is quite promising ([Click here to see the feedback](#)). The online learning forum associated with this course provides us with a unique opportunity to host discussions and hear a range of diverse perspectives on the managerial issues raised in the course. People attending the course represent more than 90 different nationalities, and the debates centered around the course materials reflect this diversity and are in themselves an immense learning opportunity, both for us and our learners. You can find more information about free registration in this course by [visiting the IGLUS webpage at: http://iglus.org/mooc](http://iglus.org/mooc)

We are currently planning the second part of the course that is set to go online Spring 2017. The second part of the course will have a more keen focus on the Management of Urban Infrastructures in presence of disruptive innovations introduced by the ICT sector; which can be labeled as Management of Smart Urban Infrastructures.

Online courses that cover managerial, regulatory and governance issues in different network industries are becoming increasingly more prevalent. So, as of this issue of NIQ we will introduce a new section that closely follows the world of online education and reviews the currently available, and the upcoming, MOOCs that might be useful for academics and practitioners active in the field of Network Industries.

If you would like to write a review about a MOOC and publish it in an upcoming issue of NIQ, please send an email to [mohamad.razaghi@epfl.ch](mailto:mohamad.razaghi@epfl.ch).



## The Transport Area of the Florence School of Regulation

The Florence School of Regulation (FSR) has been created in 2004 as a partnership between the European University Institute (EUI) and the Council of the European Energy Regulators (CEER). Since then, the Florence School of Regulation has expanded from Energy regulation to Telecommunications and Media (2009), Transport (2010) and Water (2014).

The Transport Area of the Florence School of Regulation (FSR Transport) is concerned with the regulation of all the transport modes and transport markets (including the relationship among them). It currently focuses on regulation and regulatory policies in railways, air transport, urban public transport, intermodal transport, as well as postal and delivery services.

The aim of FSR Transport is:

- to freely discuss topics of concern to regulated firms, regulators and the European Commission by way of stakeholder workshops;
- to involve all the relevant stakeholders in such discussions; and
- to actively contribute to the evolution of European regulatory policy by way of research.

The core activity of FSR Transport is the organization of policy events, where representatives of the European Commission, regulatory authorities, operators, other stakeholders, as well as academics in the field meet to shape regulatory policy in matters of European transport.

The results of FSR Transport’s activities are disseminated by way of policy briefs, working papers and academic publications. All FSR Transport materials are open source and available on the FSR Transport webpage, as they aim to involve professors, young academics and practitioners to become part of a unique open platform for applied research.

To learn more visit our website: [www.florence-school.eu](http://www.florence-school.eu) or contact us at [FSR.Transport@eui.eu](mailto:FSR.Transport@eui.eu).

### Highlight



#### Latest event: 5th Conference on the Regulation of Infrastructures

Continuing the successful format, the 5th Conference on the Regulation of Infrastructures is taking place on Friday, 24th June and brings together all research areas of the Florence School of Regulation to discuss current challenges in the regulation of the Infrastructure Industries.

### FSR-Transport events Spring 2016:

Date	Title
29 February 2016	4th Florence Intermodal Forum
9 March 2016	Executive Seminar at the World ATM Congress in Madrid
2 May 2016	12th Florence Rail Forum
3 May 2016	Executive Seminar: ERA and the Digitalization of Railways
23 June 2016	Book Presentation: Routledge Companion to Network Industries
24 June 2016	5th Conference on the Regulation of Infrastructures

For more information about our activities please contact: [FSR.Transport@eui.eu](mailto:FSR.Transport@eui.eu).



## We're hiring: Job Opportunity for a research associate at FSR Transport

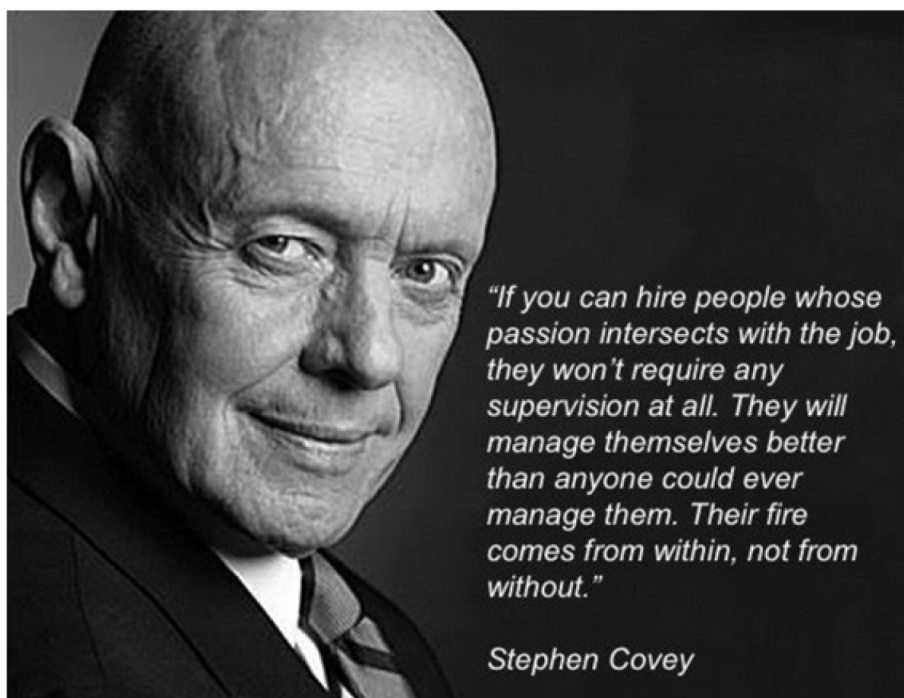
The Florence School of Regulation – Transport Area (FSR Transport) is hiring: we are looking for a research associate to join the team based in Florence, Italy.

The post holder will contribute to the core activities of the Area (organization of policy events, publications and writing in the field of rail, air and urban transport). The post holder will be responsible for the expansion of the Area's activities in other transport modes. The post holder will report to the FSR Transport Area Director and Coordinator.

Main tasks include:

- Draft and edit briefs, reports, summaries and papers for workshops.
- Organize workshops (content definition) with logistic support provided by the Conference Unit.
- Perform analytical and research tasks.
- Develop the network and communication channels of FSR Transport.
- Provide further assistance and perform additional tasks as required.

[Read the full description](#)







**networkindustries**

## Call for Papers

### Special issue on: Network Industries in Latin America

#### Guest Editors

Joisa Campanher Dutra, Getulio Vargas Foundation, Rio de Janeiro Matthias Finger, Ecole Polytechnique Fédérale Lausanne and European University Institute, Florence

Miguel Angel Montoya Bayardo, Tecnologico de Monterrey, Guadalajara

#### Abstract

The network industries in Latin America (from Mexico to Chile) are undergoing substantial changes, marked in particular by their liberalization but also their privatization. Similarly, the regulation of the network industries' sectors is gradually being institutionalized following European, American, but also endogenous approaches. Overall, however, the de- and re-regulation of the network industries in Latin America follows no clear model and results are mixed, at best. This special issue of Utilities Policy aims at shedding light at the de- and the re-regulation practices in the different network industries and in the different Latin American countries, notably Mexico, Brazil, Colombia, Peru, Argentina, Chile and others. This special issue is especially dedicated to critically analyzing these practices, along with the policies that have inspired them.

#### Topics Covered

- Description and critical assessment of the different network industries' de- and re-regulation policies and practices in Latin America, notably Mexico, Brazil, Colombia, Peru, Argentina and Chile
- Sectors covered: telecommunications, postal services, electricity, gas, air transport, rail transport, road transport, urban public transport, water and wastewater
- Comparative studies across sectors and countries are particularly welcome

#### Notes for Prospective Authors

All papers must be submitted through the Utilities Policy website: <http://ees.elsevier.com/juip/>. Make sure to upload your paper to the special Issue "Latin America".

Submitted papers can be in early draft versions, but should not have been previously published nor be currently under consideration for publication elsewhere. All papers will be selected through a peer-review process. For more information, please see the Author Guidelines page. The authors of the selected papers will be invited to either a conference in Guadalajara, Mexico, on November 21st, 2016 or a conference in Rio de Janeiro, Brazil, on November 23rd, 2016, during which their papers will be presented and critically discussed before a final submission to the special issue.

#### Important Dates

- Draft paper due on 30 September, 2016
- Notification of acceptance to the Conference on 15 October, 2016
- Conference in Guadalajara, Mexico, on 21 November, 2016 or in Rio de Janeiro, Brazil, on 23 November 2016
- Submission of revised paper on 31 January, 2017 Notification of acceptance on 15 April, 2017 Publication date: August to September 2017

# networkindustries quarterly

**Network Industries Quarterly, Vol. 18, issue 3, 2016 (September) “The challenges of digitalization and the use of data”**

## **Presentation of the next issue**

The de- and re-regulation of the different network industries is an ongoing process at national and global levels. As this process unfolds, ever new phenomena emerge. Yet, the question about the right mixture between market, economic, technical and social regulation remains wide open in all the network industries. The question becomes even more challenging when looking at recent infrastructure development as triggered by their pervasive digitalization. Not only are the different infrastructures transformed by their digitalization – e.g., digital transport, smart energy, etc. – calling for new approaches to regulating them, but moreover does digitalization become a phenomenon in its own right. The European Commission actually sees digitalization as a means to accelerate integration, to tear down regulatory walls and to move from 28 national markets to a single one. Consequently, digitalization and especially its implications in terms of privacy and security also require regulatory attention.

The next issue of the Network Industries Quarterly (NIQ) will be dedicated to some of the best papers presented at the 5th Conference on the Regulation of Infrastructures, which is organized by the Florence School of Regulation in June 2016. Selected academics and practitioners have been invited to Florence to discuss the latest developments in the regulation of different network industries, namely transport, energy, telecoms and water distribution. Both the Conference and the next issue of the NIQ have a special focus on digitalization and the role of data, and they build on the long lasting experience of all the Area directors of the Florence School of Regulation.

## **More information**

If you are interested in learning more about the “5th Conference on the Regulation of Infrastructures: The challenges of digitalization and the use of data” and the next issue of the Network Industries Quarterly, please send an email to Ms. Nadia Bert at [FSR.Transport@eui.eu](mailto:FSR.Transport@eui.eu).



## OPEN CALL FOR PAPERS

Implementation of the liberalization process has brought various challenges to incumbent firms operating in sectors such as air transport, telecommunications, energy, postal services, water and railways, as well as to new entrants, to regulators and to the public authorities.

Therefore, the Network Industries Quarterly is aimed at covering research findings regarding these challenges, to monitor the emerging trends, as well as to analyze the strategic implications of these changes in terms of regulation, risks management, governance and innovation in all, but also across, the different regulated sectors.

The Network Industries Quarterly, published by the Chair MIR (Management of Network Industry, EPFL) in collaboration with the Transport Area of the Florence School of Regulation (European University Institute), is an open access journal funded in 1998 and, since then, directed by Prof Matthias Finger.

## ARTICLE PREPARATION

The Network Industries Quarterly is a multidisciplinary international publication. Each issue is coordinated by a guest editor, who chooses four to six different articles all related to the topic chosen. Articles must be high-quality, written in clear, plain language. They should be original papers that will contribute to furthering the knowledge base of network industries policy matters. Articles can refer to theories and, when appropriate, deduce practical applications. Additionally, they can make policy recommendations and deduce management implications.

Detailed guidelines on how to submit the articles and coordinate the issue will be provided to the selected guest editor.

## ADDITIONAL INFORMATION

### MORE INFORMATION

- [network-industries.org](http://network-industries.org)
- [mir.epfl.ch](http://mir.epfl.ch)
- [florence-school.eu](http://florence-school.eu)

### QUESTIONS / COMMENTS?

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Published four times a year, the **Network Industries Quarterly** contains short analytical articles about postal, telecommunications, energy, water, transportation and network industries in general. It provides original analysis, information and opinions on current issues. Articles address a broad readership made of university researchers, policy makers, infrastructure operators and businessmen. Opinions are the sole responsibility of the author(s). Contact [fsr.transport@eui.eu](mailto:fsr.transport@eui.eu) to subscribe. Subscription is free.



## SUBJECTS

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