

Achievements and current challenges regarding public utilities' regulation in Brazil



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This Special Issue of the Network Industries Quarterly focuses on Brazil. The goal is to provide readers with an overview of the main achievements and current challenges faced by public utilities' regulation in the country.

Brazil is the seventh largest economy in the world in terms of GDP. As a consequence of the privatization program launched in the 1990s, a significant portion of public services was transferred to private investors under long-term concession agreements. This was the case of transmission and distribution of electricity, roads, railroads and telecommunications. However, despite privatization, the State remains an important player in sectors such as electricity and oil & gas, which increases the complexity of regulation considering an environment in which State-owned companies interact with private investors.

This volume of Network Industries Quarterly consists of five papers that shall provide readers with a broad sense of what happened in terms of public utilities' investment in Brazil in the last two decades and some trends for the future.

The first paper, written by the editors of this volume, presents the 1990s' reform that led to a privatization program and the concession of public utilities' services to private investors. We argue that, although such program succeeded in attracting more than USD 73 billion in investments between 1995 and 2002, the country is currently facing huge obstacles, such as the deterioration of the macroeconomic scenario; increase of legal uncertainty, political and regulatory risks; as well as lack of proper financing mechanisms and transparency.

During the 1990s Brazil also experienced the creation of regulatory independent commissions to regulate public utilities' sectors. The paper from Azumendi shows the results of a research in which he analyzed the characteristics of the members of the Board of Directors of such commissions at the federal level, in terms of their origin (whether from public or private sector), academic training (level of formal education), and process of appointment (whether they were subject to scrutiny by the National Congress or not). Azumendi concludes that while the Boards of Directors show acceptable levels of academic training and a balanced composition of members with different backgrounds, there is still room for improvement; mainly, the practice of appointing interim directors that are not scrutinized by the Senate and without mandate, should be abolished.

The three last papers are dedicated to the assessment of specific public utilities' sectors.

Ashley Brown provides us with a discussion as to whether the natural gas industry in Brazil should be liberalized adopting a simpler licensing mechanism. He claims that Brazil would have relied too much on the concession regime to foster investments in exploration, production and transportation through pipelines. In such a context, the country could benefit from a licensing regime more suitable to entry and competition. Additional hurdles to the industry development include vertical integration, a defective open access regime, insufficient market monitoring, and physical bottlenecks, such as the lack of storage facilities.

The paper by Castelar and Azevedo discusses pros and cons of unbundling infrastructure management and service provision in the rail system. The article comments on the decision to implement vertically-integrated rail concessions under the State reform of the mid-1990s, and on the 2012 frustrated tentative to unbundle the system under the Logistics Investment Program I. The paper argues that the recent decision to step back from such a very complex sectoral reform was generally a positive measure.

Finally, the paper from Canêdo-Pinheiro discusses the development of telecommunications' regulation in Brazil since the privatization program of the 1990s, emphasizing its positive results in terms of introducing competition, especially through mobile services. On the other hand, the paper argues that the telecom sector suffers from huge tax burden.

Rio de Janeiro, March, 2016

Patricia Sampaio, Joisa Dutra and Edson Gonçalves – Guest Editors

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Twenty years of infrastructure concessions in Brazil

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Abstract - The article provides readers with an overview of the development of public utilities in Brazil in the last two decades. The article concludes that, after 20 years of emphasis in the concession regime, although the country still needs huge investments in infrastructure sectors, regulatory uncertainty and deterioration of the macroeconomic scenario currently represent significant barriers to investments.

Introduction

The adequate provision of infrastructure is critical to ensure the effective functioning of an economy¹. The World Economic Forum measures the competitiveness of a country through a set of pillars, among which infrastructure is a basic one. Even though at the policy level there is an explicit commitment to improve the extent and the quality of infrastructure provision in Brazil, the recent trends in the country are not positive². In such a context, it is worth investigating the main bottlenecks to unlock the required investments in network industries in Brazil.

The era of concessions and its challenges

Similarly to several other countries, in Brazil until the 1990s vertically integrated monopolies controlled by the State were the main providers of infrastructure such as telecommunications, oil and gas, electricity, railways, ports and roads.

Following a liberalization trend previously experienced by some economies such as the UK, and Latin American countries such as Argentina and Chile, Brazil underwent a reform that included a privatization program. The Brazilian privatization program attracted more than USD 73 billion between 1995 and 2002 and allowed a significant expansion of access while improving the quality of service provision in several utilities.

In order to create the legal background for such program, in February 1995 the National Congress passed law 8,987/95 (the general public services' concession law),

which recently celebrated its 20th anniversary. It represents the inaugural landmark to rule the contractual relationship among the State and its partners – a public or private infrastructure provider – in the rendering of public services³.

Concessions and Public-Private Partnerships (PPPs) are to date still the main drivers for investments in public utilities in Brazil. For the sake of illustration, in 2015 the government launched new Programs to foster investments, aiming at attracting R\$ 200 billion for transportation infrastructure and R\$186 billion for electricity between 2015 e 2018. The success of such investment programs, however, relies on several factors that are yet to be handled. Among the main obstacles one can cite political and regulatory risk as well as lack of proper financing mechanisms and transparency.

From the economic perspective, concessions are a combination of efforts between public and private parties. Often the providers are able to meet the provision's revenue requirements through user charges – amounting to the full and standard concession. Under some circumstances, however, the concern with high prices or tariffs that could lead to exclusion of users motivates the choice for a strict PPP⁴.

The effectiveness of public-private partnerships to promote investments in infrastructure depends on several items. Firstly, the public partner/Administration must either develop the projects directly or, in case of third parties, assess the results properly. The success of the concession is critically dependent on the quality of the projects

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1 The effects of infrastructure on economic development are adequately addressed by the field of Economic Growth. For more details (not exhaustive) see Calderon & Servén (2004).

2 In the most recent assessment, Brazil's rank has downgraded from 57th to 75th position. In the infrastructure pillar Brazil ranks 74th out of 140 countries. World Economic Forum, Global Competitiveness Report 2015-2016.

3 This delegation process went on with the approval of Law 9,478/97, which rules on concessions regarding E&P in the oil and gas industry, and Law 11,079/04, which governs Public-Private Partnerships (PPPs), among other statutes.

4 In the Brazilian legal framework, "sponsored PPPs" are arrangements in which the concessionaries' revenues are complemented by government transfers to allow cost recovery.

and studies in the preparation of the bid. In Brazil, the awarding of concessions to build and operate infrastructure facilities usually takes place when the projects and viability studies are not sufficiently developed yet, adding to uncertainty and risks.

Despite the privatization process, the State remains to be an important player in infrastructure through its State-owned companies. This poses additional challenges to the institutional design and the regulation of public utilities, such as how to mitigate political interference. Corporate governance of State-owned companies has proved to be a sensitive matter, especially in light of minority shareholders' rights.

Financing infrastructure investments.

The country has been facing huge challenges lately. Private investments in infrastructure have been declining significantly in the latest years. As a consequence, Brazil is lagging behind other BRIC countries. Considering both private and public origins, investments in infrastructure range from 2% to 2.5% of the GDP, an amount considered insufficient to restore the existing stock of assets. Tables 1 and 2 report data on the evolution of aggregate and infrastructure investment in Brazil.

Table 1 – Infrastructure Investments in Brazil (% GDP)

Decade	Investments (% GDP)		Infrastructure/Total (%)
	Infrastructure	Total	
1970	5.4	22.9	23.7
1980	3.6	21.0	17.2
1990	2.3	18.8	12.2
2000	2.2	18.9	11.4
2010	2.4	22.3	10.8

Source: Velloso 2015

Table 2 – Infrastructure Investments in Brazil by sector (% GDP)

	Energy	Transportation	Telecom	Sanitation/ Water	Total
2000 decade	0.64	0.64	0.70	0.18	2.16
2011	0.73	0.84	0.50	0.17	2.24
2012	0.73	0.91	0.54	0.21	2.39
2013	0.75	1.04	0.45	0.21	2.45
2014	0.75	1.19	0.37	0.21	2.52

Source: Frischtak and Davies (2014)

The stimuli from governmental programs such as the Logistics Investment Programs I (2012) and II (2015) have not been able to overcome this scenario. Fiscal constraints, budgetary imbalance and high regulatory risk are causing postponements in the launching of new concessions.

The National Development Bank (BNDES) has been the most important financier of infrastructure in the country in the last decades. The institution is the major source of long-term financing, providing funds referenced in the Long Term Interest Rate (TJLP)⁵. This rate is comparatively lower than regular rates from commercial banks

The bank's disbursements in infrastructure increased significantly since 2003, going from USD 938 million⁶ to USD 11.2 billion⁷ in 2014. However, several reasons such as the recent economic downturn coupled with corruption scandals involving major construction companies⁸ led to a decrease in BNDES' financial operations. As a result, in 2015 the conditions to long-term funds became more stringent for both existing and new concession contracts (Table 3)⁹.

Table 3– BNDES Disbursements in Infrastructure (R\$ billion)

	2009	2010	2011	2012	2013
Transportation - auxiliary activities	2.1	3.0	3.5	4.7	7.8
Construction	2.0	1.3	0.7	0.9	1.5
Energy	14.2	13.6	16.0	18.9	19.9
Others	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Transportation – others	9.7	3.4	3.5	3.7	4.1
Public Utilities	1.5	1.9	1.9	2.0	2.1
Telecom	3.8	2.1	3.1	4.8	2.7
Transportation - railways	1.8	1.2	1.4	2.4	2.7
Transportation - toll roads	13.7	25.9	26.0	15.5	21.2
Total	48.7	52.4	56.1	52.9	62.2

Source: BNDES annual report (2013)

The closing of the infrastructure gap depends not only on promoting investments but also on the strength of regulatory institutions, the reduction of legal uncertainty and more emphasis in market mechanisms.

It would also be useful to look for recent developments in regulation of network industries in mature economies, which are facing the need to adapt to major trends such as digitalization, decentralization and climate policies. In particular, it would be useful to reassess the role of markets in these industries. For the sake of illustration, there seems to be no emphasis in market mechanisms to allocate

⁵ Long Term Interest Rate (TJLP) depends on historical inflation, expected inflation and country risk premium. The methodology is updated every year by BNDES. For details see (in Portuguese): http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/produtos/download/tjlp.pdf

⁶ It is equivalent to R\$ 2,71 billion (Brazilian currency). It was considered the exchange rate at 12/31/2003 (R\$2,8884/USD) as released by Ipeadata.

⁷ It is equivalent to R\$ 29,9 billion (Brazilian currency). It was considered the exchange rate at 12/31/2014 (R\$2,6556/USD) as released by Ipeadata.

⁸ "Lava Jato" is the federal police and Attorney-General task force operation designed to investigate frauds involving Petrobras and other State-owned companies. Several major Brazilian construction firms are being prosecuted as well as officers and politicians.

⁹ In order to illustrate the dimension of these disbursements in USD, it might be considered the annual average exchange rate (R\$/USD) released by the Central Bank of Brazil: 1.7412 in 2009, 1.6662 in 2010, 1.8758 in 2007, 2.0435 in 2012 and 2.3426 in 2013. However, it is important to keep in mind that since the disbursements are made in Reais, the calculation of the respective values in US Dollar does not reflect the original trajectory of disbursements throughout the years.

demand response, ancillary services and energy efficiency in the electricity industry. In addition, the use of economic instruments to allocate water rights among its multiple uses (such as navigation, electric energy production and irrigation) is still lagging behind (OECD, 2015)¹⁰. Stimuli should also be granted to the development of a natural gas market, considering the increasing participation of this resource in the electricity mix.

The urgent need to foster investments in logistics

Among its main challenges, Brazil urgently needs to close its logistics gap in order to become more competitive in the global context. According to the Logistics Performance Index, in 2014 Brazil ranked 65 among 160 economies assessed, having fallen from the 45th position in 2012. Roads are the dominant mode, amounting to almost 60% of the transports. Since 1994, 61 concessions representing almost 12,000 miles of roads were awarded to promote investments, aiming at an adequate provision of transportation services at both the federal (21) and state (38) levels¹¹. It is worth noting that the quality in the private provision of road services is consistently assessed as better than the public roads¹².

The initial roads concessions allowed investments at moderate tolls. However, the investments requirements in the new concessions are more stringent. Consequently, in future awards the government will have to choose between allowing higher returns (and tolls) or complementing the concessionaries' revenues (through PPPs). Even though the PPP Law was enacted in 2004, no concession at the federal level has adopted such mechanism so far¹³.

The railway system, on its turn, is quite poor in term of density and also when volume of cargo is compared to the road system¹⁴. Private investors entered into the sector in the 1990s by means of vertically-integrated long-term concession agreements executed after bidding processes. Although the concessionaires were quite successful in reducing accidents and improving freight movement in the existing railroads, the system experienced almost no expansion.

Hence, the government tried to reform the sector to induce investments mainly through additional concessions and unbundling of the industry. The 2012 Logistics Investment Program (PIL I) proposed a reform that would

mandate unbundling of infrastructure management and service provision. In order to lower freight costs and reduce demand risk to the new railroads, the new framework would rely on a scheme that would shift risks from the concessionaries to the government. A State-owned company (Valec) would buy the full rail transport capacity in advance and resell it to independent freight operators.

Such proposal is perceived as plagued by government failure. Even though the 2015 version of the Federal program (PIL II) did not bring any explicit regulatory reform, and the 2012 proposal was neither implemented nor formally abandoned, it seems that the government is shifting back to a vertically-integrated model.

Conclusion and challenges for the future

Since the mid-1990s, concession agreements have been playing a central role in public utility industries in Brazil.

Lately, however, infrastructure sectors have been facing huge challenges in attracting new investments. Among the main obstacles one can cite political and regulatory risk as well as lack of proper financing mechanisms and transparency. Concession contracts should provide for a proper risk allocation, endowing the government with mechanisms to handle unforeseen or uncontracted events inherent to long-run relationships. It is also important to create an environment favorable to attract capital, assuring a viable financing structure. Besides, soft bottlenecks are important impoundments to the success of infrastructure concessions, adding to the perception of regulatory risk. Included in this category are the business environment and proper corporate governance of utilities, especially for State-owned companies.

The reversal of this critical scenario requires private capital markets to complement BNDES funds; opening the market to foreign operators and construction companies; emphasizing market mechanisms; amending the auction design and the concession contracts to properly allocate risks between public and private partners; and improvements in the regulatory agencies' decision-making process. These issues are essential to enhance the role of concessions as instruments to foster investments delivering better and more reliable infrastructure, inducing the country's competitiveness and growth.

10 OECD (2015), Water Resources Governance in Brazil, OECD Studies on Water, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264238121-en>.

11 ABCR (2014). Statistics data 2014. <http://www.abcr.org.br/SetoremNumeros/SetorNumeros.aspx?codigo=3&texto=http%3a%2f%2fwww.abcr.org.br%2fConteudo%2fSecao%2f43%2festatisticas.aspx>

12 CNT (2015). Pesquisa CNT de Rodovias 2015, Relatório Gerencial, Brasília. http://pesquisarodoviascms.cnt.org.br/Relatorio%20Geral/PESQUISA_CNT2015_BAIXA.pdf

13 Brandão and Saraiva (2008) model the BR-163 road concession as a PPP using a real options approach. Contrary to the favorable results of the adoption of the mechanism, the government awarded the concession allocating part of the investments to DNIT, a public company. Due to financial distress, the government initiated a renegotiation process to shift the responsibility of the investments back to the concessionary.

14 According to the National Logistics and Transportation Plan, in 2011 the rail system accounted for only 25% of the total cargo transported, whereas roads accounted for more than 50%. Ministry of Transportation. National Logistics and Transportation Plan (PNLT), 2012.

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Boards of infrastructure regulators: the case of Brazilian federal regulatory agency

Sebastian Azumendi*

Abstract - This article presents the first comprehensive assessment of Boards of Directors of regulatory agencies of the infrastructure sector of Brazil. Through a unique dataset, the paper describes the configuration of Boards, identifying recommendations for policy reform. Boards were assessed throughout the life of the agency, from the establishment of the agency to December 2015.

Context

Decision-making in independent regulators has been a recurrent area of concern in the infrastructure sector. It is often argued that a professionalized Board of Directors would insulate politics and allow the adoption of rational regulatory policies. Furthermore, this would be beneficial for all actors including consumers, providers and the government. The case for the full professionalization of Boards has been held normatively but also supported by empirical evidence.

The literature has emphasized the positive impact of professionalized Boards of Directors, over politically oriented ones, on decision-making. In a study of Boards of Directors of State-Owned Enterprises of Italian municipalities, Menozzi et al (2011) find that politized Boards of Directors have a positive and significant effect on employment but this is not reflected in differences in performance. In an extensive review of Board effectiveness, Vagliasindi (2008) referred to relevant literature pointing out a significant correlation, especially in developing countries, between Board composition and company's financial performance. Finally, Lopez Azumendi et al (2011) found a positive correlation between the governance of state-owned enterprises, particularly its Board of Directors, and firms' sector performance.

The composition and role of Boards in regulatory agencies of Brazil has been understudied, especially using historical data series. This paper presents the first comprehensive assessment of Boards of Directors of Brazilian regulatory agencies. Through unique datasets, the paper describes the composition of Boards for nine (9) regulatory agencies, providing policy recommendations for improvement. Findings contribute positively to the literature on regulatory governance and public sector management.

Methodology

This paper addresses the configuration and functioning

of Boards of Directors in regulatory agencies of Brazil. The assessment is based on different measurements of Boards' governance: composition, academic levels, and procedures of appointment. The assessment is based on a unique dataset, built within the Center for Regulation of Infrastructure (CERI), using historical data series. Boards of regulatory agencies were analyzed since the establishment of each agency until the year 2015.

Assessment

Origin of Directors

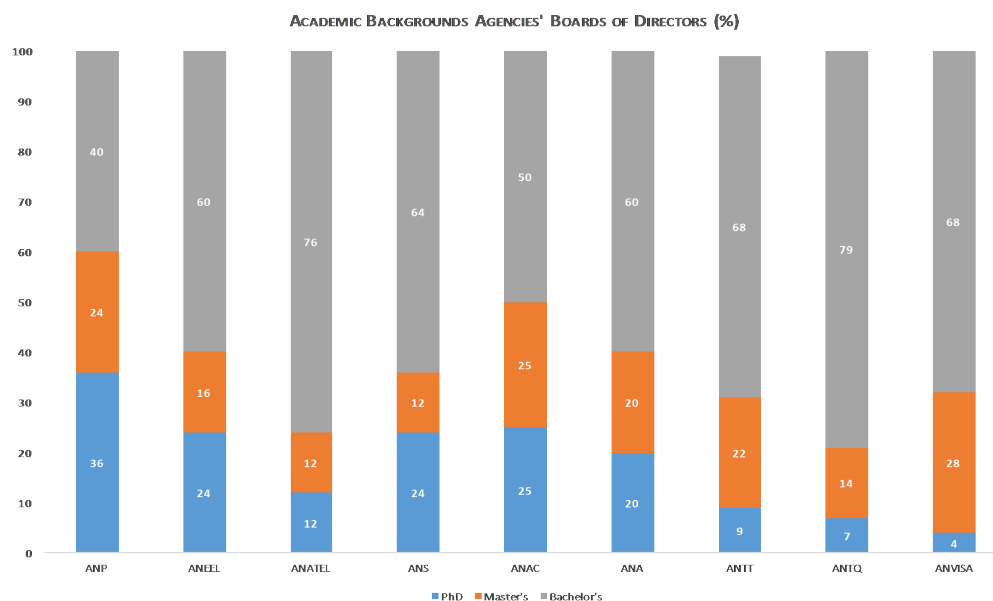
This measurement takes into consideration the job of the Director before his/her appointment. It is an important "proxy" of both competence and independence. It measures the relevance of the job and the relationship of the Board member with politics and the regulated sector.

Results show a homogenous representation of different regulatory actors. The majority (22%) of Directors come from high-level positions within the agency, which guarantees Board members with knowledge of the sector and a professional reputation he/she would like to maintain. The telecommunications' regulator has the majority of (57%) of Directors coming from the agency's bureaucracy.

The second most relevant group of Directors comes from companies. Directors from the private sector represent, since the establishment of agencies in the country, around twelve percent (12%) of all appointments. Regulators of the transport and oil sectors have approximately thirty percent (30%) of their members from the private sector. State-owned enterprises (SOEs) have lower levels of representation on agencies' Boards than the private sector.

Political representatives such as Secretaries of State and Ministers are not as relevant as Directors from the agencies' bureaucracy and the private sector. Regulators of the airport (15%), water (7%), and oil sectors (17%) have

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the highest levels of political representation. Secretaries of State are preferred to Ministers as Directors of regulators.

Academic training

A second measurement of Board's governance is the academic background of those appointed as Directors. It could be assumed that a Director with a good academic formation would be not only knowledgeable about the sector but also interested in progressing in his career or insulating his/her professional name from bad regulatory decisions. Law 9.986/2000 requires members of the Boards of regulatory agencies to have a university degree.

Results from the dataset show that only a few percentage of Directors, since agencies were established, held a postgraduate degree before appointment. Out of four hundred and thirty-two (432) Directors (total number of Directors appointed since the establishment of agencies in Brazil), only eighteen percent (18%) held a PhD or a Master's degree before appointment. Agencies operating in technologically driven sectors tend to have Board members with better skills than those agencies operating in sectors with less technological demands.

Procedures of appointment

The President with the agreement of the Senate appoints Board members of regulatory agencies in Brazil. According to Law 9.986/2000, members of the Board need to comply with the following criteria: have a Brazilian nationality, a university degree, lack of a criminal record, and be well regarded in the field of the agency's mandate.

Even though most of the Directors have been appointed following legal requirements, there is a recent trend

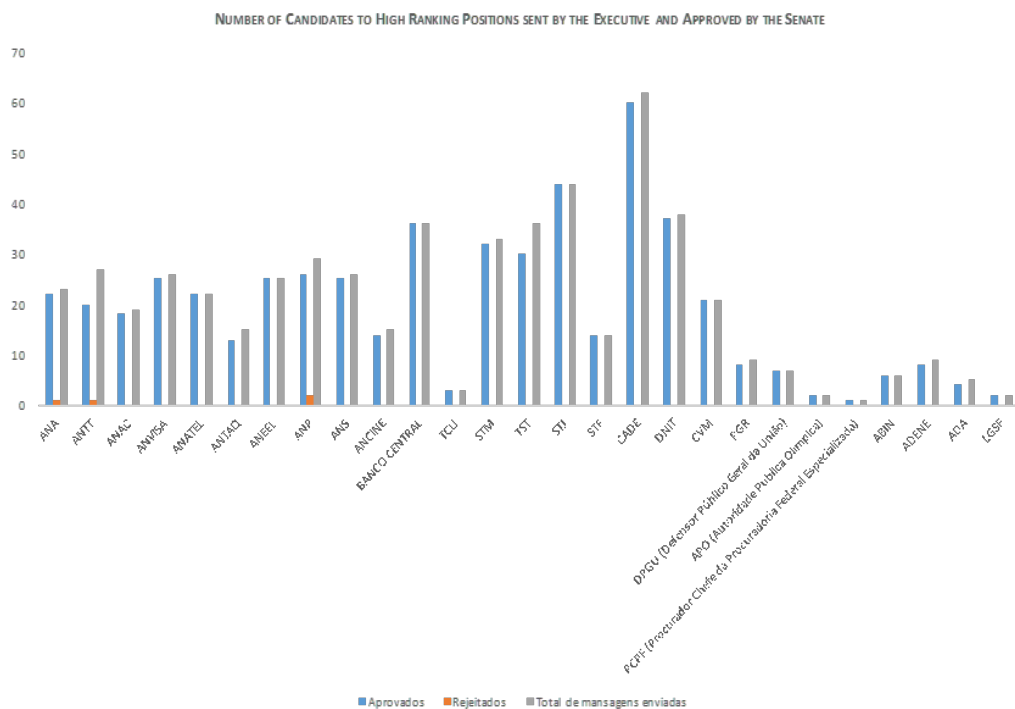
of appointing acting Directors. The President of the country, ad-hoc the Senate's confirmation, appoints acting Directors. According to the dataset, regulators of the telecommunications and transport sectors have the largest numbers of acting Directors among all regulatory agencies of Brazil. This situation poses a threat to the principle of autonomy of decision-making as in many cases the mandate of acting Directors is extended over time, not complying with Law 9.986/2000.

Data from Congress shows that the Senate has rejected a limited number of Directors. The approval by the Senate of candidates proposed by the Executive has been, since the beginning of regulatory agencies, almost complete. Moreover, data from Congress also shows that most of candidates to high-level positions that need Senate approval have received his agreement.

Conclusion

Independent and professionalized Boards of Directors were introduced in regulatory agencies of Brazil as a way to insulate politics from regulatory-making. It has been a process that, with ups and downs, has been maintained and improved over time. This has differentiated Brazil from other Latin American countries, such as Argentina, that once fostered better infrastructure regulation through independent commissions.

The analysis of Boards of nine (9) regulatory agencies of Brazil over their lifetime shows positive results as well as space for improvement. On the one hand, Boards of Directors show acceptable levels of academic training and a balanced composition of members with different backgrounds, the majority coming from high-level positions within the agency. On the other hand, the practice of ap-



pointing acting Directors, avoiding the agreement of the Senate and requirements established in Law 9.986/2000, should be banned as it poses significant threats to the principle of autonomous decision-making.

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Natural gas in Brazil: opening the bottlenecks

Ashley Brown*

Abstract - The most noteworthy characteristic of the Brazilian natural gas industry is that it is plagued by a number of bottlenecks. These bottlenecks are major barriers to the evolution of the entire energy sector in one of the world's major economies. While one can understand, historically, how they came into being, it is imperative that, in the context of contemporary reality, that they be identified and alleviated. The bottleneck chokes are derived from a variety of sources, bureaucratic, economic, and physical, and it is useful to discuss them in terms of those three categories.

Bureaucratic Bottlenecks

The bureaucratic origins of the problem stem from two sources, the licensing system, and the heavy reliance on central planning. First, in regard to central planning, the problem is that it places all initiative in the hands of the state. It is the state that must carry out geological studies to identify potential areas for drilling, deciding whether or not to grant concessions for the rights to drill, and, if so, then define boundaries for the granting of concessions. In addition, for adding infrastructure such as natural gas pipelines, it is the state, through its planning process which predefines where investment should go. Private entities, which might be willing to put its capital to work building out infrastructure, are not allowed to do so without having to obtain a concession which is largely defined through a central planning system. While such a system might be understood if treasury funds were put at risk, it lacks any real rationale where the capital being used is purely private. While the theory underlying the policy is that pipelines are a responsibility of the state, which the government can either perform or enable a private concessionaire to carry out, it must be cognized that that theory can also be served by a liberalized system that reduces or eliminates archaic bureaucratic barriers to putting infrastructure in place to serve the nation.

The licensing problem is that the system, largely derived from medieval French law and Portuguese colonial practice, discourages individual exploration. Interestingly, in regard to mining, Brazil has repudiated that tradition. While in natural gas, any party who conducts exploratory activities for the resource, has no assurance that he will reap the benefits of his work, because any discovery reported to the state will then have to be put out to competitive bidding that others may very well win. That is dramatic contrast to what occurs in mining, where a par-

ty exploring for minerals can obtain a license to carry out his search, and, if he is successful in finding minerals, he is very likely to be the one who benefits from the work he did. In short, the incentive for private investors to search for natural gas does not exist. Why bother to explore if you are not all that likely to be the beneficiary of your own efforts?

While it is true that the resources below the surface belong to the state in Brazil, that fact does not compel such a top down approach that strongly discourages private risk taking in searching for natural gas. The state's interest is not in a perverse set of incentives that only makes the discovery of gas less likely, but, rather, is in gaining its fair share of the value of the resource, and in assuring that extraction is carried out in a way that least disturbs the environment and public safety. Those objectives can easily be achieved by a combination of taxes and sensible regulation, but do not require that all initiative is left to a bureaucratic process that confounds meaningful and productive economic signals.

Economic Bottlenecks

The economic arrangements within which the pipelines operate include a series of barriers to optimize the sector. These barriers include the following:

Vertical Integration

The natural gas industry has a variety of components, but its midstream consists of two basic elements, the commodity business and the transport (pipeline) business. The first component, like any other commodity market, is, absent artificial constraints, a competitive activity. The transport function, absent appropriate structural or alternative transport arrangements to preclude it, is a classic

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monopoly function. Indeed, the pipeline is the only means available to transport natural gas to the marketplace. Thus, it is obvious that if a participant in the commodity market, controls the monopoly facility providing market access to all players in the commodity business, the entity controlling that access will use that position to its competitive advantage and keep competitors from accessing the marketplace. That is precisely the situation in Brazil's natural gas industry. Petrobras, the dominant player in the commodity business, with very little, if any, constraint, also controls the transport system that all commodity players need to move their product to market. For a major world economy, such a constraint is a severe handicap, unless it is mitigated through either structural separation (i.e. no company in the pipeline transport business can be in the commodity business and vice versa), or through legal/regulatory measures that mitigate the monopoly power of the vertically integrated entity. While structural separation or disaggregation of transport and commodity functions is self-explanatory as a resolution of the problem, the problems associated with vertical integration, even without structural separation, can also be mitigated by the following measures, ones which are not currently in place in Brazil.

Open Access

The most obvious way to mitigate monopoly power in the natural gas transport business is to mandate open access, and, of course, to vigorously enforce that mandate. In Brazil, under present law, there is effectively, no open access for alternative suppliers of natural gas. While the revisions in the natural gas law a few years ago called for open access after a period of time, it is, at best a tepid step, and, at least, for a period of time, leaves vertical integration intact. In the absence of open access, a regime in which any party seeking to sell natural gas, has the ability to reach its customers, it is hardly surprising that there are precious few entrants into the market, not only to buy, sell, or trade natural gas, but also to engage in seeking natural gas because of uncertainty of market access. Indeed, "uncertainty," is an understatement, given the fact that the pipelines are controlled by a competing supplier of gas. The problem of closed access is, of course, compounded by the fact, noted earlier, that the concession process makes it extraordinarily difficult for an investor to build its own pipelines to bypass the bottleneck controlled by a competitor. Stated simply, open access is the sine qua non of a fully functional and robust natural gas market. Without transparent and open access, the Brazilian natural gas market will remain out of sync with modern notions of the business, and will lack a fully functional market.

Market Monitoring

A critical component of open access is the existence of an independent market monitor. The function of the monitor is to monitor and make transparent to all, the actual real time use of the pipeline. By having a monitor, the pipeline owner/ operator will not be relied upon to indicate whether or not capacity is available for other users to access. This is a particularly valuable function where, as in the case of Brazil, the owner/operator is also a vendor of natural gas, and, therefore, has an economic incentive to deny access to a competitor. If the pipeline were entirely outside of the control of a buyer or seller of natural gas, the market monitor's role might be a less important one, but in the context of the Brazilian situation, it is essential. It is very poor public policy to rely on representations regarding the availability of access from a party that has a powerful economic motivation to deny availability. The monitor would also be invaluable for the regulator should it be asked to mandate access for a party to whom it was denied. It would allow the regulator to know, in real time, what capacity is or ought to be available.

Capacity Market

It is important to note that the lack of multiple pipelines does not mean that competition cannot exist in providing pipeline capacity. The right to buy, sell, and use pipeline capacity is completely severable from ownership and/or operation of the facility. Indeed, it is common practice in many pipeline systems to sell, or even lease the right to use a designated amount of a pipeline's capacity. By making those rights fully fungible, a high degree of liquidity is injected into the capacity market and monopoly power is significantly reduced. It also offers potential investors in new pipelines as an opportunity to spread the investment risk. The fact is that secondary capacity markets are quite common in pipeline systems, and Brazil would be well served by enabling their evolution.

Physical Bottlenecks

Pipelines are not the only physical bottlenecks on the system. The absence of storage facilities is also a major handicap. Storage would enable buyers and sellers to manage pipeline constraints, avail themselves of price fluctuations in the market, and manage seasonal fluctuations that may be found in the movement of natural gas into and around Brazil. It would be useful to facilitate the process for licensing storage facilities and approving tariff arrangements for them.

Rail regulation in Brazil

Armando Castelar*, Luísa Azevedo**

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

The current decade is shaping up as a new lost decade for the Brazilian economy. According to estimates from the Brazilian Institute of Economics (Ibre/FGV), by 2020 per capita GDP will probably be back to the level first reached in 2010. Although ill-devised macroeconomic policies are largely to blame for this outcome, poor infrastructure has also contributed to keep output growth down. This is particularly true regarding transportation. Thus, according to the 2015-2016 Global Competitiveness Report (World Economic Forum, 2015), among 140 countries for which these indicators are available, Brazil ranks 121 in roads, 120 in ports, 95 in airports and 98 in railroads regarding the quality of infrastructure.

It is not hard to pinpoint the factors leading to the poor condition of Brazil's rail sector. Through the second half of the 20th century, as in much of the rest of the world, Brazilian railroads lost market share and became financially unsustainable. In particular, state-ownership caused policy (and political) objectives to influence managerial decisions and led to tariffs that failed to reflect costs and rose below inflation.

Brazil's rail freight sector was privatized in the mid-1990s¹. A new regulatory framework for the sector, together with the concession contracts, established the rules the new private operators had to follow. In addition, in 2001 the government created a regulatory agency, the National Agency of Terrestrial Transport (ANTT, in Portuguese), to oversee the sector and enforce the concession contracts. Concessionaires committed to meeting specific output and security goals, but were otherwise subject to only light regulation, being free to decide how to reach their goals. This framework worked rather well,

with the goals being largely surpassed: in the following 15 years (1997-2012), the accident rate fell 83% and rail output, measured in ton-kilometer, grew at an annual average of 5.3% (Pinheiro 2014).

The first reform of the Brazilian rail sector

Although sector performance has generally improved, various problems persist. Average train speed remains low and investment in rail infrastructure, particularly in greenfield projects, has not expanded. In the beginning of the 2010's, the government concluded that there was insufficient competition among rail operators and that this explained the low investment in network expansion. In response, in 2011 ANTT enacted new regulations that significantly altered the regulatory framework of the Brazilian rail sector. The new rules sought to foster competition and investment by separating the operation infrastructure (tracks and stations) from that of transport services per se.

While reforming regulation, the government also launched, in 2012, the Logistics Investment Program (PIL, in Portuguese), a list of infrastructure projects to be granted as concessions to private investors. These new concessions would operate under complete vertical separation, with Valec – a state-owned enterprise – playing the role of a surrogate market for slots in the rail infrastructure. To that end, an open access regime would be set up and Valec would intermediate interactions between infrastructure concessionaires and transport operators. In particular, Valec would buy all transport capacity from the former, therefore eliminating demand risk. This was deemed necessary to encourage greenfield projects. Afterwards, Valec would resell the right to use rail tracks to transport operators. This mechanism would channel subsidies to

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¹ Aside from suburban trains, rail passenger service in Brazil is almost inexistent.

investors, since the government did not expect Valec to be able to resell all the available capacity. The infrastructure operators would also be able to borrow from BNDES, the Brazilian Development Bank, at highly subsidized interest rates.

For existing concessions, not susceptible to separation, the idea was to enforce new, more stringent rules concerning access rights, which basically foresaw unbundling the operations of infrastructure and transportation. The regulatory model in force since the privatization already established right of way rules, but the legal regulations of 2011 created instruments that facilitated their implementation.

The reform of railway regulation in Europe, which has been under way for the last two decades, was the source of inspiration for the 2011 reforms in Brazil. It is remarkable, however, that the Brazilian authorities tried to emulate the new European regulatory framework, considering that vertical separation in Europe has had ambiguous effects, or worse, and that Brazil's institutional setup is so different². Indeed, what the European experience has actually taught us is that, to work well, vertical separation in the rail sector requires a complex, well-functioning institutional framework (Finger 2014). Without a regulatory body fully equipped and capable of processing, producing and conveying the relevant information to stakeholders – serving as the official/main disseminator of the sector's technical and legal facts –, as well as of coordinating decisions across firms, vertical separation will do little good to the efficiency of railways.

In fact, just the opposite may happen: establishing an open access regime with separation of infrastructure and transportation services raises operational and transaction costs, generating other sources of inefficiency. The main reason for that is that vertical separation requires different firms to coordinate their decisions in a context of asymmetric information, conflicting goals, and low entry barriers in the transport services segment. Economic theory teaches us that, in this context, moral hazard – for instance, it is very hard for a third party to determine, ex-post, each firm's responsibility in an accident, making it attractive to sub invest in maintenance – and adverse selection will become more prevalent.

Other unwanted outcomes that may emerge from vertical separation of railways are cream skimming (independent transport providers, who do not own tracks,

may only be interested in the most lucrative segments and products, leaving the rest unserved) and the excessive use of rail infrastructure, in a “tragedy-of-commons” situation. Furthermore, the increase in transaction costs make contracts less complete and more prone to judicial disputes, further pressuring administrative and operational costs – already up due to the loss of economies of scope³. Lastly, if the regulator tries to avoid such contractual problems through micro-regulation, it will likely increase firms' administrative costs, in addition to reducing their flexibility to operate.

It is not surprising, therefore, that most countries have adopted a vertically integrated model in the rail freight sector. Among the existing systems, American railways are the most successful: since the enactment of the Staggers Act, which greatly deregulated the sector, while preserving its institutional setup, railroads in the United States have significantly increased their productivity and lowered accident rates. At the same time, they have become financially sound (Association of American Railroads 2015).

Thus, the 2011 reform of railway regulation not only overlooked the evidence from Europe, but also contrasted with the general stance regarding the sector's structure worldwide. And this in a country with weak regulatory institutions⁴. Moreover, the new framework was a radical departure from the existing model, generally perceived as successful although in need of some improvement. The new model also lacked a solid legal basis⁵, making an already unstable business environment even more uncertain. Finally, a key flaw in the new model was its dependence on Valec's ability to honor payments for the infrastructure capacity it was supposed to buy: this would depend on it receiving annual transfers from the Treasury, over decades, which unsurprisingly made investors jittery.

The second reform of the Brazilian rail sector and the challenges ahead

It was a bad idea to adopt such dramatic regulatory changes while also trying to attract investors to bid at new greenfield projects. Not by chance, thus, none of the railway projects listed in the PIL attracted private interest. In June 2015, the government announced the new stage of the Logistics Investment Program (PIL 2). It expects capital outlays of approximately US\$ 46 billion, of which US\$ 20 billion (over 40%) in railroads. In this new stage, the government plans to return to the vertically integrated

2 See Drew and Nash (2011) and van de Velde et al (2012), for instance.

3 There is evidence that it is less costly for a single firm to provide railway infrastructure and transport services for different products than it is for different firms to do that separately (Ivaldi and McCullough 2008, Bitzan 2003, Cantos Sánchez 2001 and Wetzell and Growitsch 2006).

4 Over the past ten years, the Brazilian government has progressively weakened regulatory agencies by diverting some of their responsibilities to other bodies and leaving executive positions vacant, for example.

5 Because of the nature of the legal instruments used to establish the new regulation of the rail sector, they didn't go through the ordinary legislative procedure. Instead, the public administration unilaterally designed them (Ribeiro 2015).

concession model adopted during the privatization of the sector.

We see this as a positive change. Yet, we are not optimistic that this stage will be any more successful than the preceding one for a number of reasons. First, more than US\$ 9 billion, or a fifth of total funds, correspond to the Brazilian part of the Bioceanic Railway, a continental railroad that is projected to cross South America through Brazil and Peru, linking the Atlantic to the Pacific Ocean. The Chinese government has shown great interest in this new trade route, and committed to prepare the project and possibly implement it, but at this stage it seems inappropriate to consider investments in a project that complex – involving environmental and diplomatic issues, among others – as likely to happen within the PIL 2's timeframe. Indeed, no one has yet done a study to check whether the Bioceanic Railway is economically viable.

Second, the other railway undertakings included in the PIL 2 are a recast of the projects that were part of the original PIL, comprising the construction of four thousand km of tracks, as well as investments of US\$ 3.7 billion in existing concessions. It is unclear why investors will be more interested in them than before, considering the much less favorable current economic environment.

Third, regulatory uncertainty remains high. With a rising fiscal deficit⁶, the government decided to back away from the regulatory reform initiated in 2011, but failed to state what it planned to do instead⁷. Yet, from what the Brazilian government has (or not) declared since it launched the PIL 2, it is reasonable to assume that it has abandoned the idea of separating infrastructure and transport operations or implementing an open access regime in the rail freight sector. It is clear, thus, that new concessions will take place according to a vertically integrated model and that Valec's role in the sector will be again limited to procuring civil works. However, the authorities continue to advocate in favor of unbundling infrastructure from transportation services and of track sharing as a means to foster competition.

Fourth, the government's track record on project structuring in infrastructure is quite poor. Thus, a feature of the rail undertakings listed in the PIL 2 that deserves attention is the government's plan to outsource project preparation to private firms, through a mechanism known as "expression of interest procedure" (PMI, in Portuguese), which resembles the unsolicited proposal scheme also seen in other countries⁸. Unsolicited proposals have become

quite common in emerging countries, but, in Brazil, the recourse to PMIs in infrastructure projects has not shown great results. Indeed, few PMI studies have actually led to project implementation. Additionally, the evidence suggests that such procedure limits competition in procurement, although there are ways to mitigate that risk by changing the rules.

The Brazilian government proposed a financial model for railway projects under the PIL 2 very similar to that in the original program: that is, plenty of subsidized BNDES loans. The government expects easy credit to compensate for high regulatory risk and to allow for low transport tariffs. In other words, not only users, but also taxpayers will bear a large part of the cost of railway investment. Nevertheless, investors have seriously questioned the actual availability of those resources, given the current fiscal crisis.

Conclusion

In sum, the Brazilian government seems to have given up on vertical separation and open access in the rail sector. In principle, this is broadly a good thing. However, regulatory uncertainty remains high, especially because the government has conducted this process with insufficient transparency and clarity about its goals. Moreover, important issues such as the low speed of trains and the difficulty to develop greenfield projects have not been addressed.

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⁶ In 2014, Brazil's primary budget deficit as a percentage of GDP was 0.6%; Ibre/FGV estimates that this ratio will reach 2% in 2015 and 1.5% in 2016.

⁷ So far, the authorities have said nothing about plans for a new regulatory framework either in official documents – such as those referring to railway projects under the PIL 2 – or on public appearances.

⁸ A PMI is a cross between solicited and unsolicited proposals, in the sense that the government selects the project, but private parties develop it. This is not the usual practice in developed nations.

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Mobile telephone service in Brazil: High Dissemination, Low Use

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Abstract - Brazil was successful in introducing competition and in disseminating the access to (mobile) telecommunications services. But there is room for improvement, especially with respect to taxation.

Introduction

Much of gap between Brazil and the more developed countries is due to problems with its infrastructure. The positive impact of investment and adequate provision of infrastructure services on the levels and rates of growth of per capita income, as well as the indicators of inequality, is well known and documented. Specifically, there is solid evidence in relation to telecommunications and the Internet: mobile telephone service (GRUBER & KOUTROUMPIS, 2011), including broadband mobile (THOMPSON JR & GARBACZ, 2011).

The positive impacts are manifested through different channels: from increased productivity in companies, including increased household income (mainly for the self-employed) and the welfare of consumers, to the economic effect of the investments needed to sustain the provision of these services. Furthermore, since they represent network infrastructure, that is, because the benefits increase when a larger number of users are connected, these gains tend to be seen only after a certain level of the dissemination of the services is reached.

Unlike other types of infrastructure, telecommunications is not a mature sector. Technology has evolved at an astounding rate, a fact that continues to create difficulties for attempts at regulation. Or deregulation, to the extent that some segments are potentially competitive.

It should be noted that with regard to infrastructure in general and transportation (roads, railways, ports and airports) indicators, Brazil's performance is below average for middle-income countries and similar (and sometimes lower) than that of poor countries. On the other hand, Brazil's lack of infrastructure appears to be relatively less with respect to communications, since Brazil displays a higher than average performance than the middle-income countries. In the specific case of mobile telephone service,

Brazil is fairly close to the average for the rich countries.

In Brazil, telecommunications is probably the sector in which the liberalizing reforms of the 1990s were the most complete and most successful. The mobile telephone service segment is emblematic: all the relevant companies are private, competition was established, access to services has increased significantly and investment remained high.

The process of introduction of mobile services in Brazil started in the late 1980s. In 1988, a precedent was set for the private operation of such service without, however, preventing the state-run telecom carriers from doing so. In 1997, ANATEL's jurisdiction was established for publishing the regulations for this service. With the breakup of the Telebras System, the country was divided into ten areas, with two frequency bands for each area assigned, called band A and band B. Band A was reserved for the former Telebras System companies and band B was specified for the new carriers. After the tender for band B bandwidth usage, whose contracts were signed between June 1997 and April 1998, the privatization process of the former Telebras System carriers (band A) was initiated.

With the start of the auctions of new frequency bands, and the mergers and acquisitions between the companies, the mobile phone market gradually migrated to its current configuration. Today, there are four mobile phone companies with national coverage and a reasonably balanced market: Vivo (Telefónica), TIM (Telecom Italia), Claro (América Móvil) and Oi (Portugal Telecom and Brazilian partners). Moreover, there is a fifth company specialized in mobile services (SME or trunking), which also operates throughout Brazil (Nextel, of the Nextel NII group).

Between 2003 and 2014, the number of households with a telephone went from just over 30 million to approximately 63 million (Figure 1). This trend is even more striking when measured as a proportion of total house-

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holds: 61% in 2003 and 93% in 2014. Moreover, much of this progress can be attributed to an increase in the penetration of cell phone service. In most Brazilian households, the cell phone is the only means of access to telephone service services. This trend is more pronounced among low-income households. The massification of telecommunications in Brazil is largely a result of the expansion of mobile services, especially in the pre-paid mode.

The comparison of the spread of mobile telephone service in Brazil with other groups of countries only confirms these results. In recent years, the penetration of mobile phones in Brazil neared the average of the rich countries much faster than the average of the other middle-income countries.

However, there is one thing that can counteract the diagnosis of success of the spread of mobile telephone service in Brazil. On one hand, there was a significant increase in access. On the other, although it has increased in recent years, the use of the mobile services is still relatively low in Brazil, even after adjusting for differences in income between the countries.

This is probably related to the pricing of mobile services: in many international comparisons, with different methodologies, Brazil always appears among the countries where mobile services are more expensive (see, for example, BARRANTES & GALPERIN, 2008). By way of illustration, in 2012 the average rate (in dollars adjusted for purchasing power parity) for calls made from prepaid cell phones in Brazil was the 140th highest in the world (out of 144 countries) (WORLD ECONOMIC FORUM & INSEAD, 2014). In 2011 the cost of a typical basket of mobile services in Brazil (also measured in dollars adjusted for purchasing power parity) was the 157th in the world (out of 161 countries) (ITU, 2012). From this point of view, the success of mobile telephone service in Brazil should at least be subject to qualification.

In summary, the limited use of mobile services by Brazilians apparently is not explained by elements of demand, but rather by supply: typically, its prices are higher in Brazil than in the rest of the world. This being the case, what are the causes of such high prices?

Competition

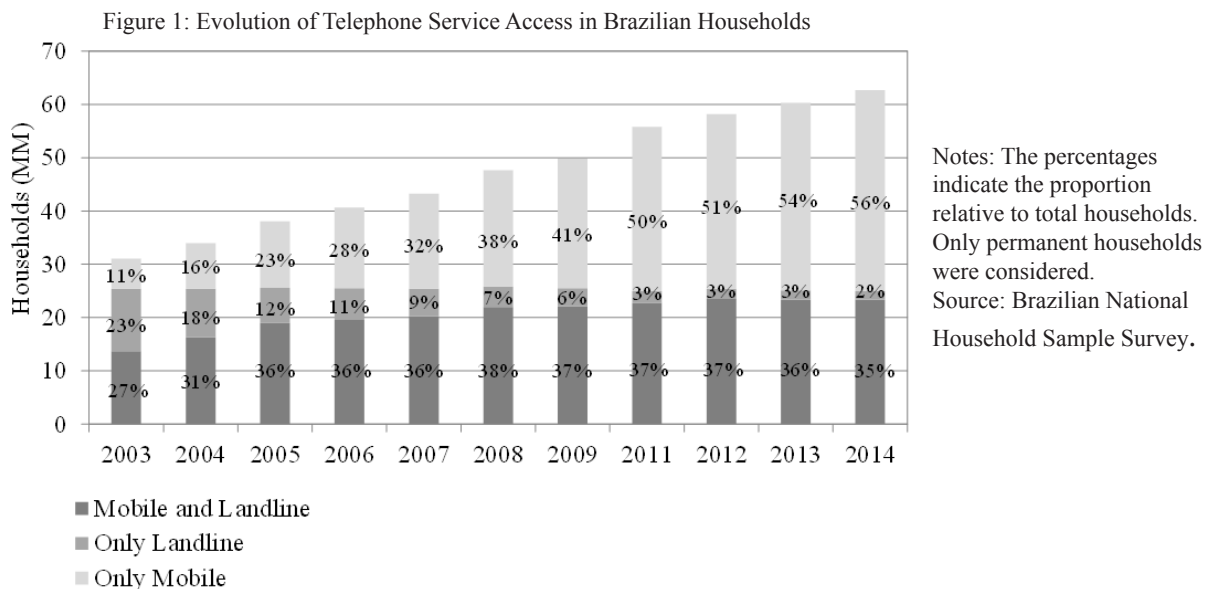
The most obvious explanation would be the absence of competition. However, Brazil has five major companies providing mobile services on a national scale and the observation of the indices of industry concentration indicates that apparently there is competition in Brazil. But, despite the low concentration of the market, companies - tacitly or explicitly - could be acting in a coordinated manner to raise prices. Again, this does not seem to be the case. The profitability of Brazilian companies in the sector is among the lowest in the world, making this explanation implausible.

Tax Burden

Thus, all that remains to investigate are the costs incurred in the provision of mobile services in Brazil. Are they higher than in other countries? In this regard, the first thing that comes to attention is the tax burden on telecommunications services. Typically, tax burden is around 43% on telecommunication services in Brazil, one of the highest in the world (DELOITTE & GSMA, 2011).

There is considerable debate in the United States on the need and gains involving the reduction of taxation on these services (see, for example, HAUSMAN, 2000). If this debate is relevant in the American context - where income is higher and the tax burden (around 17%) is significantly lower compared with Brazil - surely it is also important in the Brazilian context.

It is possible to calculate the impact of reducing the tax



burden on mobile services in Brazil to the prevailing average level in the United States. The producer surplus would increase by R\$ 2.9 billion a year, the consumer surplus to R\$ 10.6 billion and the collection of taxes would decrease by R\$ 8.8 billion. In net terms, that is, discounting the purely distributive effects, in which the gain of one agent is simply a loss for another, it represents an increase of R\$ 4.7 billion per year. It should be emphasized that these estimates refer only to mobile voice services and do not include data services such as mobile broadband.

It is clear that reducing taxes on mobile services would generate not insignificant gains in welfare. However, in the Brazilian case it is a difficult policy to put into practice. For many states, the revenues from these taxes account for much of the overall tax revenue; and even for the federal government there is currently little room for the reduction of tax burdens.

Remuneration for Networks

Another possible explanation for the high price of mobile services could be the remuneration model of the mobile carriers' networks. Whenever a (mobile or fixed-line) call is made, the company originating the call must pay the receiving company for the use of its network. In Brazil, although it has come down in recent years, the amount of such remuneration for mobile networks (called VU-M in Brazil) is still high by international standards.

Indeed, in principle it would be expected that the incentives are such that companies would negotiate an amount close to the marginal cost of the termination of the call, at least in the case where the traffic between companies is reasonably balanced (payments would cancel each other out). But this is not what happens in practice, not only in Brazil, but in most countries. In this instance, we need to separate two distinct cases.

The first refers to calls that originate from fixed-line telephones and terminate with mobile phones (F2M). In this case, the mobile phone companies have the capacity and the incentive to charge values higher than the marginal cost of call termination. Intuitively, by charging amounts above cost, the mobile phone companies could use the profits to reduce the charges to subscribers and attract more consumers, especially if the competition is vigorous, as seems to be the case in Brazil. That is, competition acts in the direction of increasing the termination rate, not reducing it. In this case, the literature predicts that a reduction in the termination rate of the mobile networks results in: (i) lower prices for users of fixed-line services; (ii) a reduction in the profitability of mobile carriers; (iii) a reduction of the diffusion of mobile phones (GENAKOS & VALLETTI, 2012).

Item (iii) is known as the waterbed effect. Since there are positive network externalities, mobile companies have incentives to compete aggressively for new customers by reducing subscriptions. The revenue loss with this strategy is compensated by higher incoming call traffic. Thus, the higher the termination rate, the more aggressive can be the strategy. Therefore, although the reduction in the termination rate tends to reduce the price paid per minute for calls (mobile and fixed-line), it generates an offsetting increase in the value of the subscription and, thus, a decrease in the penetration of the mobile services (BAIGORRI & MALDONADO, 2014).

The second case deals with calls between mobile phones of distinct companies (M2M). In this situation there is a tendency towards a better balance between traffic that enters and leaves each network. Precisely because of this interdependence, termination rates can be used as an instrument of tacit collusion. In this case, under certain conditions (limited externalities and preponderance of competition in linear prices), a reduction in termination rates can generate lower prices for mobile calls without significant effects on the diffusion of that service (GENAKOS & VALLETTI, 2012).

If mobile services are relatively less important than fixed-line services, the trend is that the dominant effect is that of fixed-to-mobile calls. This probably was the case when much of the regulatory framework of the sector was initially defined. In practice, because the regulators commonly require that termination rates are the same for calls originating from fixed-line or mobile networks, what is observed is that they are concerned about very high rates, and not very low rates. Not coincidentally, various regulators, especially in Europe, have moved to regulate them, usually by setting values that are close to some measurement of costs.

In Brazil, there has always been concern about reducing the mobile termination rates. The main argument is that they help subsidize the pre-paid mobile phones. In short, it is feared that the reduction in mobile termination rates could trigger the waterbed effect and reduce the spread of these services, especially among the low-income consumers who are more sensitive to increases in the price of the subscription rate. Some authors reported that, in the Brazilian case, this possibility actually exists (see BAIGORRI & MALDONADO, 2014, for example). However, these are studies that use older data, in periods when mobile telephone service had lower relative importance (and, therefore, the waterbed effect had greater relevance).

The empirical literature with international data also follows this pattern. In earlier periods, the waterbed

effect is shown to be quite relevant. However, in the recent literature this effect usually tends to disappear (see KONGAUT & BOHLIN, 2014 for references). Because of this, after small initial reductions, ANATEL recently decided to reduce the maximum reference value for the mobile termination rates more consistently. By 2019, this amount should fall to something close to the incremental long-term cost. If the empirical literature is correct, and if one observes what happened in other countries that have adopted this strategy, a reduction in the price of mobile services is expected without a significant impact on its dissemination (or on the profitability of the companies).

Final Considerations

The importance of communications infrastructure in the development of countries and increasing productivity is widely documented. And, in this regard Brazil's relative backwardness in communications compared with other sectors, is smaller. This partly reflects the success of the sector's regulatory model, especially the positive results in terms of introducing competition (especially in mobile services). Obviously, this should not be taken to mean there is no room for improvement.

There are major opportunities to progress with respect to taxation of services and equipment. In the case of services, Brazil's tax regime is one of the highest in the world. For equipment, although there are public policies for tax reductions, the protection the industry enjoys in the domestic market ends up making their prices very expensive compared to other countries.

In the case of network remuneration, Brazil chose to follow the experience of other countries and reduced the termination rates for mobile services. It is expected that in the coming years the price of services will be reduced.

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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.



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 or contact us at FSR.Transport@eui.eu.

Highlight



The European Transport Regulation Observer series enters the EU Bookshop

The *Observer* is published approximately four weeks after each Transport Forum and reflects upon the discussed topics. It features a summary of the discussions at the Forum focusing on the most important arguments in the debate thanks to comments of Prof Matthias Finger and other specialized academics.

The Observer carries an ISSN number and, from now you can find it also in the [EU Bookshop](#).

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
24 June 2016	5th Conference on the Regulation of Infrastructures

For more information about our activities please contact: FSR.Transport@eui.eu.



5th Conference on the Regulation of Infrastructures

The final programme of the 5th Conference on the Regulation of Infrastructures is now available: 10 papers have been selected by the Scientific Committee, and the authors of those papers will come to Florence to present and discuss them at the FSR annual conference.

Join the discussion! Please contact Ms Nadia Bert at FSR.Transport@eui.eu

Conference Topic

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.

This [5th Florence Conference on the Regulation of Infrastructures](#) aims at taking stock of the major challenges infrastructure regulation is currently facing in the age of their rapid digitalization.



RAIL ECONOMICS, POLICY AND REGULATION IN EUROPE

Edited by **Matthias Finger**, Ecole Polytechnique Fédérale Lausanne (EPFL), Switzerland, European University Institute, Italy and **Pierre Messulam**, Transilien SNCF, France

'Railways – they are one of the most powerful and symbolic modes of transport. They are especially important for Europe and for many decades the EU has tried to facilitate their development. This book provides a lot of good analysis of the problems of contemporary European railways. It also contains many interesting proposals on how to solve these problems. Highly recommended reading for all who are interested in transport and logistics.'

– Siim Kallas, former Vice-President of the European Commission, Commissioner for Transport 2010–2014

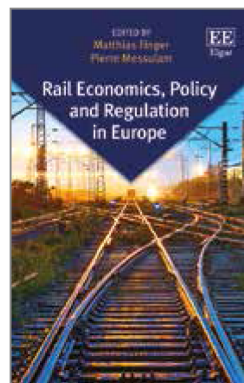
The European railway sector has gone through profound, yet mostly institutional, changes over the past 20 years, owing mainly to the initiatives of the European Commission. This book constitutes a first systematic account and assessment of the recent transformations of the European railway sector, whilst also covering the main segments such as passenger transport, high speed and freight.

The expert contributors have been charting these developments over the past five years. They provide a critical analysis of relevant, yet contentious, issues such as competition, unbundling, regulation, access charging, standards and interoperability, and public-private partnerships.

Practically-minded academics, as well as academically-oriented practitioners, interested in the railway sector and other public transport sectors will find this book to be a crucial read. It will also be of use to postgraduates studying infrastructure economics, policy and regulation.

Contributors: N. Baron, A.S. Bergantino, J. Dehornoy, M. Dillon, N. Fearnley, M. Finger, R. Gevaers, T. Holvad, A. Jan, N. Keogh, G. Knieps, J. Maes, A. Meaney, P. Messulam, F. Mizutani, C. Nash, S. Olsen, J. Runde Krogstad, M. Sanchez-Borras, D. van de Velde, E. Van de Voorde, T. Vanelslander

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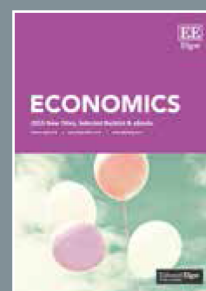
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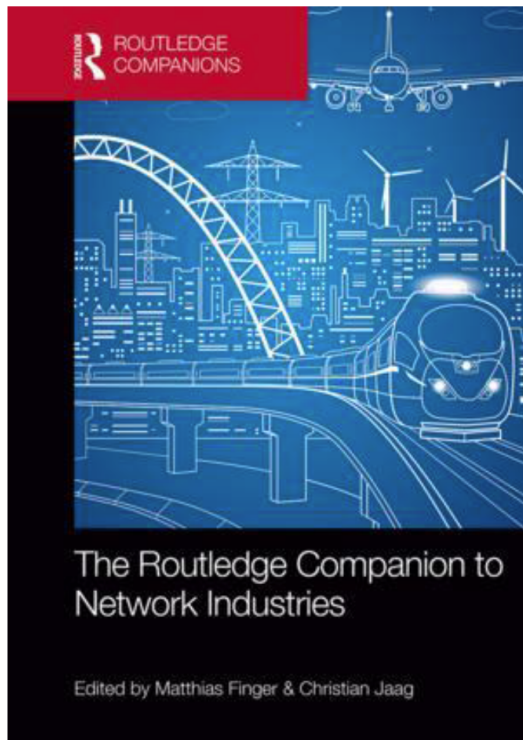
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The Routledge Companion to Network Industries

Edited by Matthias Finger, Christian Jaag

© 2016 – Routledge

424 pages | 69 B/W Illus.

[Look inside](#)

About the Editors

Matthias Finger holds the Swiss Post Chair in Management of Network Industries at EPFL, Switzerland. He is also the Director of the Florence School of Regulation's Transport Area at the EUI, Italy.

Christian Jaag is Managing Partner at Swiss Economics and Lecturer in Economics at the Universities of St Gallen and Zürich as well as at EPFL, Switzerland.

About the Book

In recent decades, network industries around the world have gone through periods of de- and re-regulation. With vast amounts of sometimes conflicting research carried out into specific network industries, the time has come for a critical over-arching assessment of this entire industry in order to provide a platform of understanding to aid future research and practice.

This comprehensive resource provides an orientation for academics, policy makers and managers as to the main economic, regulatory and commercial challenges in the network industries. The book is split into sections covering market, policy, regulation, management perspectives, whilst all of the key network industries are covered, including energy, transport, water and telecommunications.

Overseen by world-class Editors and experts in the field, this inter-disciplinary resource is essential reading for students and researchers in international business, industrial economics and the industries.

About the Series

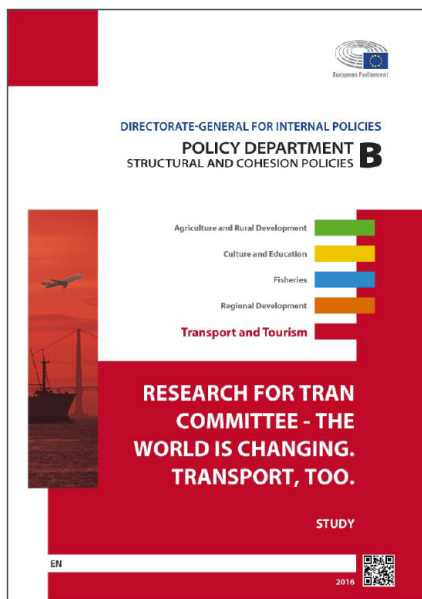
Routledge Companions in Business, Management and Accounting are prestige reference works providing an overview of a whole subject area or sub-discipline. These books survey the state of the discipline including emerging and cutting edge areas. Providing a comprehensive, up to date, definitive work of reference, Routledge Companions can be cited as an authoritative source on the subject.

A key aspect of these Routledge Companions is their international scope and relevance. Edited by an array of highly regarded scholars, these volumes also benefit from teams of contributors which reflect an international range of perspectives.

Individually, *Routledge Companions in Business, Management and Accounting* provide an impactful one-stop-shop resource for each theme covered. Collectively, they represent a comprehensive learning and research resource for researchers, postgraduate students and practitioners.

[SAVE THE DATE: Book Presentation and discussion with authors and editors](#)

23 June 2016, European University Institute (Florence – Italy)



Research for the TRAN Committee - The world is changing. Transport, too.

Part I: “New trends in transport demand and related impact on transport systems and patterns” by University of Leeds, Institute for Transport Studies

Part II: “Changes in technologies to meet emerging urban mobility patterns” by InnoZ GmbH

Part III: “The role of regulation in preparing transport for the future” by the Transport Area of the Florence School of Regulation

© 2016 – Study of the European Parliament; Directorate General for Internal Policies; Policy Department of Structural and Cohesion Policies; Transport and Tourism

122 pages.

About the Study

With ITS-Leeds and InnoZ GmbH, FSR-Transport team contributed to a major new report for the European Parliament Transport and Tourism (TRAN) Committee on future transport trends and policies. The study was requested by the TRAN Committee to answer the initial question "World is changing, does transport follow?".

The (more and more urban) European population is growing and ageing. Mobile information and communication technologies are developing rapidly. Global competition and the fight against climate change are pressing. These developments all have an impact on transport as a whole: mobility needs and patterns evolve; new transport services/systems emerge; transportation technologies aim to become more 'environmentally-efficient'.

This transformation challenges the existing transport sector's structure and governance and calls for major changes in the regulatory framework. FSR-Transport particularly focused on the regulatory implications of the current demographic, socioeconomic, technological, environmental and financial challenges affecting different transport modes and the mobility system as a whole.

Table of contents (Part III)

1. Introduction. 2. Regulating Transport. 2.1. European transport policy and the role of regulation. 2.2. New trends and developments. 3. Future challenges in regulating the different transport sectors in Europe. 3.1. Rail: Infrastructure regulation, intermodality and independent regulators. 3.2. Aviation: Regulating infrastructure and new technologies. 3.3. Road Transport: Regulating innovation and enforcing existing regulation. 3.4. Regulating waterborne transport: key for intermodality. 3.5. Regulating the data layer in transport: Intelligent Transport Systems (ITS). 4. Conclusion: the enabling role of regulation. Rigorous implementation and new perspectives. 4.1. Rigorous implementation. 4.2. New perspectives.

About the Series

The *Directorate-General for Internal Policies of the Union* is responsible for organising the work of European Parliament's committees in the field of internal policies and contributing to the exercise and development of the legislative and control powers of the European Parliament. Among its main tasks, DG I POL is providing the committees, other parliamentary bodies and the President's Office with briefings, background notes and long-term studies on all aspects of Parliament's activities in the field of internal policies. Directorate B is the responsible one for Structural and Cohesion Policies.

[Download the study](#)

networkindustries

quarterly

Network Industries Quarterly, Vol. 18, issue 2, 2016 (June) “Financing of infrastructures in Latin America”

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 GDP) 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 result of 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 process to be difficult. Some examples of these conditions are the decrease in the price of commodities, the strengthening of the U.S. dollar, and the decrease in the flow of capital in the region, causing a negative impact on capital allocation to infrastructure in LAC’s.

One other reason for low investment in infrastructure in LAC’s is that it has traditionally been financed with public debt, through bank lenders. In this context, 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 through money and capital markets to finance infrastructure.

Despite the above, the LAC’s capital markets are not sufficiently developed, compared to advanced economies. Also in LAC’s, there 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 investment in infrastructure in LAC’s, through money and capital markets, it is necessary to create the institutional and market conditions. In order to do so, the LAC’s 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 increase their risks exposition.

The goal of this special issue is to measure the effects, causes and consequences of inadequate levels of infrastructure investment in LAC’s. It is also to help in understanding the restrictions that money and capital markets in LAC’s are facing as they strive to increase their participation in the process of infrastructure financing. Also, the objective of this special issue is to help to identify the conditions for the capital and money markets to increase their participation in the infrastructure financing process.

The topics for the special issue can include, but are not limited to, the following:

- Effects of regulation, or lack of regulation, in LAC financial markets on infrastructure investment
- How the different sources of financing infrastructure affect LAC economic growth
- Effects of securitization on infrastructure investment
- The role of institutional investors, such as pension and mutual funds on financing infrastructure
- The influence of high transactions costs, political and governance risks, and policy and regulatory barriers on infrastructure financing
- The conditions for the proper implementation of Public Private Partnerships PPP’s
- New source of financing infrastructure in LAC, given regulatory and other restrictions
- The role of collaterals or guarantees in promoting financing infrastructure

Submission Guidelines

If you are interested in contributing, please send an email to the editors of this special issue on “Financing of infrastructures in Latin America”, Dr. Arturo Bernal Ponce (larturo.bernal@itesm.mx), with a cc to Nadia Bert at FSR.Transport@eui.eu.

Formatting

- Title: Straightforward — without a subtitle (maximum 12 words)
- Author: First and last name
- Abstract: Two sentences that summarize the content of the article (30 words +/- 5)
- Body: Content of the article (minimum 1 250 words; maximum 2 500 words)
- Tables: Maximum of two tables or figures (subtract 250 words per item in the maximum word count)
- References List of references cited in the body (10 references +/- 2)

Important Dates

- Full paper: 1 May 2016.
- Publication of the issue: 21 Jun 2016.



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, Tecnológico 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

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

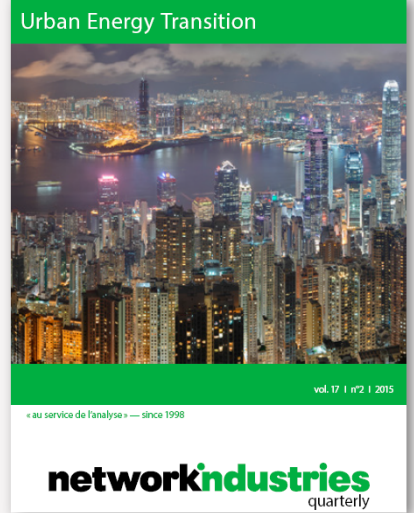
MORE INFORMATION

- network-industries.org
- mir.epfl.ch
- florence-school.eu

QUESTIONS / COMMENTS?

Nadia Bert, Managing Editor:
nadia.bert@eui.eu
Mohamad Razaghi, Publication
 Editor: mohamad.razaghi@epfl.ch

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 to subscribe. Subscription is free.



SUBJECTS

- Vol. 17 - No. 4 (2015)*
Local utilities and public services in Europe: challenges and opportunities
- Vol 17 - No 3 (2015)*
Regulating of Infrastructure Industries in emerging countries
- Vol 17 - No 2 (2015)*
Urban Energy Transition
- Vol 17 - No 1 (2015)*
Network Industries in Eurasia
- Vol 16 - No 4 (2014)*
Business Groups in Network Industries
- Vol 16 - No 3 (2014)*
Corporate governance of public utilities
- Vol 16 - No 2 (2014)*
Regulating Railways
- Vol 16 - No 1 (2014)*
Consumer Involvement in Network Industries' Regulation