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Regulation of logistics infrastructure in Brazil

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Abbreviations

ANAC	National Civil Aviation Agency
ANEEL	Electricity Regulatory Agency
ANTAQ	National Agency for Water Transportation
ANTT	National Land Transportation Agency
ANVISA	National Health Surveillance Agency
BNDES	Brazilian Development Bank
CADE	Brazilian Antitrust Authority
CAP	Port Authority Council
CND	National Council of Divestiture
CNT	Brazilian National Transport Confederation
CREMA	Roadway Maintenance and Rehabilitation Contracts
DAC	Air Force's Civil Aviation Department
DNER	National Road Department
DNIT	Transport Infrastructure Department
DNPVN	National Department of Ports and Navigable Waterways
EGR	Empresa Gaúcha de Rodovias
ENAP	National School of Public Administration
EPL	Planning and Logistic Company
FAEP	Support Fund for Structuring Partnerships
FDI	Foreign Direct Investment
FRN	National Highway Fund
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
IBRD	International Bank for Reconstruction and Development
IPEA	Institute for Applied Economic Research
IRR	Internal Rates of Return

LPI	Logistics Performance Index
MEAT	Most Economically Advantageous Tender
OECD	Organisation for Economic Co-operation and Development
OGMO	Labour management body
PAC	Growth Acceleration Programme
PATO	Annual Plan of Work and Budget
PDP	Productive Development Partnership
PER	Highway Exploration Programme
PIL	Logistics Investment Program
PND	Brazilian Privatization Programme
PNMR	Roadway Maintenance National Plan
PPI	Programme for Investment Partnerships
PPP	Public-Private Partnership
RFSSA	Federal Railroad Corporation
SAC	Secretariat of Civil Aviation
SPV	Special Purpose Vehicle
TCU	Federal Court of Accounts
VLI	Valor da Logística Integrada
WACC	Weighted Average Cost of Capital

Preface

This report represents the joint work of a team of researchers from the Centre of Analysis of Risk and Regulation (**carr**) at the London School of Economics and Political Science and RAND Europe. The study was conducted with the financial support of the UK's Prosperity Fund.

Under the terms of this funding arrangement, the Brazilian Ministries of Planejamento, Desenvolvimento e Gestão (Planning) and Fazenda (Finance) put forward a proposal to the UK Embassy in Brazil for a study on improving the regulation of logistics infrastructures in Brazil. The initial proposal was submitted under the Presidency of Dilma Rousseff. The proposal was taken forward after the government of President Michel Temer had taken over. Beyond changes in personnel, the change in administration did not affect the nature of this study to any major extent. Logistics infrastructures are at the core of all parties' interest with ideological difference largely focusing on questions of regulation and ownership. The study's focus on regulation was strengthened following further consultation with the ministries in September 2016.

carr and RAND Europe acted as co-implementers for this study, with the support of the Instituto de Pesquisa Econômica Aplicada (IPEA). We are particularly grateful to Bruno Cunha at IPEA for his enthusiastic collaboration and support. He has also contributed considerably to the work on 'regulatory capacity'.

The research was conducted between June 2016 and March 2017. It involved documentary analysis as well as interviews, in person (in Brasilia, in November 2016) and by 'traditional' and internet-telephone. Following academic convention, our interviewees have to remain anonymous, but we are indebted to them for so enthusiastically giving their time to speak to us and support our research.

In addition, we held a number of project workshops – one in Brasilia with the key ministry stakeholders in September 2016, a webinar on public-private partnerships and auctions held simultaneously in London and Brasilia in October, and a workshop at IPEA during our research stay in November. Our preliminary recommendations were discussed during a special session of the UK-Brazil Infrastructure Task Force in London in January 2017.

We are very thankful for the comments during these sessions, and especially to Geoffrey Myers (Ofcom), Daniel Fairhead (NAO) and Martin Malinowski (NAO) for contributing to the webinar. We are also grateful for support and advice from the UK embassy in Brazil, in particular Martin Badham, Matheus Ortega, Maira Brito and Amanda Akemi.

Brazil is encountering extraordinarily challenging times. Regulation plays a central role in encouraging the development of logistics infrastructures. This is a long-term challenge that will go beyond the timeframes of any one government. We hope that our report supports the embedding of regulatory capacity across Brazilian institutions.

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Executive summary

1. Logistics infrastructures are critical for social and economic development. Enhancing infrastructures has therefore become a central theme for governments internationally. Given the state of public finances, the key challenge is how to attract sufficient private investment into infrastructures so as to achieve social and economic development.
2. Over the past three decades, the regulation of logistics infrastructures has been a critical part of the wider economic policy debate in Brazil. This has gone hand-in-hand with a range of policy initiatives, at the state and federal level. This study focuses on the federal level. The latest initiatives, launched in the second half of 2016, have sought to emphasize predictability and credibility so as to attract private and 'new' investment from international sources.
3. Concessions are central to all debates surrounding logistics infrastructures. Brazil, as the wider international context, has utilized a range of models, which, in turn, have added to the dispersed and highly complex regulatory landscape. Past initiatives have had, at best, mixed success and have been widely criticized for encouraging a 'gambling culture' among concession-holders, namely optimistic bidding in view of subsequent renegotiations. Other concessions were accused of lacking sufficient incentives and performance monitoring.
4. Sector and cross-sector challenges surround in particular:
    a. Getting sufficient infrastructure investment to improve capacity. (Even with the concession model investments in network expansion and capacity improvements are often minimal and insufficient.)
    b. Inconsistent policy making with regards to infrastructure.
    c. The complexity of regulation.
5. Recent initiatives, such as the creation of the high-profile PPI and provisional measures that seek to set the parameters for concessions renewal and termination address to some extent the diagnosed deficits. However, there remains the need to develop a consistent strategic understanding of the role of PPI in relationship to ministries and regulators, and between ministries and regulators. More generally, there is an urgent need to develop a more strategic perspective on the development of logistics infrastructures, including wider sustainable social and economic development considerations, and inter-modal analysis.
6. Regulatory governance is at the heart of attracting investment for logistics infrastructures. Earlier approaches have been criticized for the micro-management exercised by central government and for the perverse incentives set by domestic lending institutions. Whatever the current preferences in

terms of facilitating investment and competition, there are long-term issues that require addressing. These are:

a. The need for a stable policy framework that allows for long-term planning and consistent decision-making
b. The need for a strategic capacity to develop logistics infrastructure that goes beyond the politically and administrative convenient.
c. The need to develop a clear understanding of the PPI (or any other central unit) as a coordinator of concession plans that promotes regulatory agencies and ministries in developing concessions
d. The need for appropriate resourcing of regulatory agencies to support the monitoring of concessions along agreed 'tramlines'.
e. The need for a reputation among concession-holders that 'gambling' is not lucrative and that regulatory regimes are credible and not prone to ad-hoc renegotiation on the basis of political pressure.

7. This report diagnoses a number of regulatory capacity deficits, ranging from the need to enhance analytical strategic considerations, the need to consider coordination and oversight more directly, as well as to develop more challenge capacities, At present, regulatory debate in Brazil is shaped by an emphasis on reducing 'discretion'. This emphasis is understandable in view of the contemporary political climate, but is unlikely to enhance overall regulatory capacity. This report puts forward the notion of 'disciplined discretion' as a model for the development of regulatory capacity. A move towards 'disciplined discretion' requires closer attention to the deployment of particular tools

   a. Procedural tools should be used to enhance the information base for decision-making and the quality of their application should be supported through review mechanisms.
   b. Engagement tools should be used to encourage less adversarial relationships with stakeholders and more informed decision-making, but will require a mediating and controlling role by regulators.
   c. Incentive tools should be used to discourage the widespread 'gambling culture' and benchmarking should be used to enable comparison across projects.
   d. The need to address the relationship between Casa Civil, the departments of Finance and Planning, sectoral ministries and regulators on the one hand, and the relationships between sectoral ministries, regulatory agencies and firms on the other. This requires, over the medium-term, emphasis on enhancing the organisational capacity of ministries, and, in the short-,medium- and long-term, a cooperative framework that enables agencies to engage in the decision-making processes, for example, through the development of cooperation protocols.
   e. Challenge tools should be encouraged to enhance the strategic quality of decision-making by drawing on the dispersed capacities within the federal government. However, such challenge functions should not lead to further risk-aversion in decision-making. This requires, therefore, the creation of 'safe spaces'.

8. In the immediate future, regulatory challenges relate to:

   a. Renegotiating concessions. The new Provisional Measure 752 from 2016 provided a legal tool for renegotiating concessions or returning failing concessions back to the government (allowing for

arbitration to set the level of compensation for the concessionaire). However, it remained to be seen if this limited renegotiations or signalled to new investors that contracts will continue to be adjusted.

b. The complexity of the administrative set-up that can result in inconsistent decision-making and application of rules leading to insufficient oversight and control. There were a number of issues with regards to the functioning of regulatory agencies. Overlapping responsibilities across sector bodies create issues around coordination and responsibility.

c. The challenging political and economic environment makes demand forecasting difficult. Options around managing this uncertainty risk can be explored in the concessions, as to some extent has been done in the current 2017 round of airport concessions.

9. Among the institutional choices to develop logistics infrastructures, three central options exist (and variations among them). Each one of them has distinct implications for regulatory governance and capacity.

   a. The use of 'special purpose vehicles' to speed-up individual projects and create 'islands of excellence'. Such vehicles would require the presence of an established legal and inter-governmental arrangement involving the federation and the states. It would not necessarily support sustained capacity-building beyond the individual projects and therefore potentially lack overall strategic coherence.

   b. The creation of new institutional capacity to develop strategy oversight and offer overall responsibility over logistics infrastructure planning, also involving regulatory agencies. Such centralizing initiatives would address some of the existing concerns about role understandings, but would add further complexity to the existing administrative landscape and would risk adding to gridlock rather than resolving it.

   c. The use of coordination protocols to establish a clearer set of mutual understandings about roles and responsibilities. Such protocols might enable regulatory agencies to support the overall development and oversight of concessions. Such protocols will require central oversight to prevent gridlock.

1. Overview

This report deals with the regulation of logistics infrastructures in Brazil, focusing in particular on the federal level. Brazil, one of the key emerging economies in the world, has a particular need for developing logistics infrastructures. Past initiatives however have suffered from a lack of strategic perspective and from poor regulatory capacity. They have encouraged poor strategic investments and a 'gaming culture' among concession holders. The latest reforms have sought to strengthen the credibility and predictability of regulatory frameworks to attract 'better' and 'new' private investment into expanding Brazil's logistics infrastructure. This report argues that such an approach towards regulation is unlikely to be sufficient. Instead, it argues for a renewed focus on regulatory governance and regulatory capacity.

This study therefore is interested in developing insights and recommendations that both serve the development of regulatory capacity in Brazil – a country that has witnessed considerable investment into its regulatory frameworks over the past two decades – and address sector-specific challenges:

- Chapter 2 introduces the overall challenges in dealing with the regulation of logistics infrastructures and highlights the variety of mechanisms that exist in establishing public-private partnerships.
- Chapter 3 discusses the trajectory of logistics infrastructure regulation in Brazil, paying particular attention to the changes that were introduced in the second half of 2016.
- Chapter 4 assesses challenges for regulatory governance and provides for recommendations for the development of improvement regulatory governance.
- Chapter 5 assesses diagnosed regulatory capacity and develops recommendations for addressing these capacity deficits.
- Chapter 6 provides an overview of the sector-specific and cross-sectoral challenges that affect logistics infrastructure regulation in Brazil.
- Chapter 7 summarizes the recommendations.

2. Regulating logistics infrastructures

Logistics infrastructures are of central importance for social and economic development. They also have important geo-political significance. It is therefore no surprise that logistics infrastructures are of critical political significance as well. In this chapter, we introduce some of the parameters of this study, highlighting, first, the importance of logistics infrastructures for development before defining the specific challenges that affect the regulation of logistics infrastructures.

The importance of logistics infrastructures

Infrastructures are central to economic and social life (Estache and Wren-Lewis, 2010). The link between infrastructure and prosperity and welfare is well established, including the impact of infrastructure on poverty alleviation, equality, market access, job creation, health and education (e.g. Calderon and Serven, 2010). Since the beginning of the 1990s a number of empirical studies have documented that public investment in infrastructure has a significant positive impact on economic output. For instance, the seminal study by Aschauer (1989) underlines the fact that the decline in US productivity in the 1970s was due to a lack of infrastructure investment and hence triggered a debate among economists and policymakers around the issue. Further studies concluded that a stock of infrastructure assets is positively associated with economic growth; infrastructure tends to be particularly important for the support of processes of structural transformation, including the shift from primary to tertiary industries (Agenor, 2011; Straub, 2008). In addition, urbanization, rising populations and international trade place additional demands on the development of high quality infrastructure.

In order to facilitate trade, different types of infrastructure are critical, including airports, ports, roads and rail lines as they are vital for connecting a country to the outside world. Nowadays, 60 per cent of international trade involves intermediate goods and around 30 per cent of this is conducted between affiliates of the same multinational corporation (World Economic Forum, 2012). The growth of such global value chains, factors affecting trade costs are crucial for facilitating trade.

Logistics infrastructures – road, rail, ports and airports – are therefore vital for boosting development and economic growth (see e.g. World Bank, 2012a). Using the World Bank's Logistics Performance Index (LPI), Portugal-Perez and Wilson (2012) find that countries with high level quality logistics infrastructure have faster trade expansion and more rapid economic growth than countries with low level quality logistics

infrastructure.[1] Logistics infrastructures can contribute to economic growth and prosperity by, for example, reducing transportation costs, increasing the durability of capital goods, and fostering trade and investment.

However, one central challenge for supporting the development of sustainable logistics infrastructures is finance. The financing gap for infrastructure varies across developing countries suffering most of the investment gap. Financing of infrastructure poses a major constraint, with the financing gap in low-and middle income countries recently estimated to be between $1.25 to $1.5 trillion per year or an equivalent of five to six per cent of low- and middle income countries GDP (Battacharya et al., 2012).

The logistics infrastructure landscape in Brazil was highly diverse and has developed around industry needs (mainly companies that extract and trade commodities). This pattern has continued to shape logistics infrastructure development. At the time of writing, prospective infrastructure development projects sought to improve the connection between production areas and the ports on the South and South-East and building a North-West to North-East connection. Historically, private companies built their own logistics infrastructure solutions (e.g. own rail lines, ports). This pattern was ongoing. Infrastructures therefore emerged that suited the private interests of the companies, but did not consider the wider public good of additional infrastructure capacity and its potential strategic benefits. Furthermore, large vertically integrated businesses (whose core business was not in logistics) sought to gain control of large concessions in order to use existing infrastructure for their own cargo, or at least to establish preferred access conditions.

This report focuses in particular on the regulation of logistics infrastructures: without appropriate regulatory framework, it is unlikely that states will be able to attractive sufficient private investment to finance their infrastructures, especially in light of depleted public finances. Brazil suffered from general and particular challenges in developing regulatory capacities regardless of exchange rate volatility that has been a continuous feature affecting long-term policy-making. Before turning to the challenges for Brazil, this chapter considers the fundamental characteristics of logistics infrastructures as a challenge for governance in general, and regulation especially.

The regulatory challenge

Logistics infrastructures – roads, rail, ports and airports – represent a unique form of infrastructure in that they offer capacity and connections for third parties to conduct economic and social transactions. They are inherently decoupled from the operational services utilizing the infrastructure as road haulage benefits from access to decent roads, shipping is attracted to well-functioning and positioned ports, rail can play a significant role in transporting goods and passengers if infrastructures offer the promise of reliability and speed.

Logistics infrastructure represents a unique policy problem in that they are a ‘club good’: access can be restricted and crowding effects are reached at certain threshold points. Similarly, low levels of activity are

[1] In essence, the LPI index compares the trade logistics profiles of around 155 countries and rates them on a scale of one (worst) to five (best).

also likely to generate further decline of demand in some logistics infrastructures rather than others. At the same time, logistic infrastructures' 'service' is to provide access to third parties and to provide services to facilitate the operations of the third party. Regulation therefore has to focus in particular on access conditions in order to avoid potential abuse of monopolistic conditions, as well as avoid lack of returns on the initial investment.

There are locational natural monopoly characteristics in some logistics infrastructures rather than others. There can be rapid changes in terms of moves from one port to another, and the same holds for airports that cater for similar regions. This is less likely to occur in the case of roads or rail. At the same time, investment into major infrastructures is likely to introduce path dependency effects given the need for supportive infrastructures, labour and other productive factors.

2.1. Common regulatory issues in logistics infrastructure

As noted, the regulation of logistics infrastructures needs to address a number of critical design choices. Public private partnerships (discussed further below and understood as 'concessions' under Brazilian law) [2] therefore vary on a range of dimensions:

- **Ownership and divestiture.** This involves an actual sale to the private sector (however constituted). But, there are political concerns with transferring ownership of national assets to foreign-owned entities, especially when logistics infrastructures are seen as strategically important (Roberts, 2010). There are also questions about the structuring of the 'infrastructure' (i.e. fully integrated or horizontally divided).
- **New commissioning ('greenfield sites').** This involves the government commissioning new investment projects to generate capacity.
- **Concession and franchises:** this involves the long-term assignment of responsibilities for some investment and service obligations, as well as for operations and management.
- **Operations and management ('brownfield sites').** Under these arrangements, operators are only assigned responsibility to run facilities, without investment requirements. These arrangements are usually less long-term than concessions.

2.2. Regulatory governance challenges

Whatever variation in terms of arrangement is chosen, particular regulatory challenges exist (Horn 1995; Lodge and Stirton, 2006; Baldwin et al., 2012: chapter 20). These challenges can be defined as:

[2] How a PPP is defined varies across jurisdictions. In Brazil, for instance, there are specific legal regimes applicable to 'pure' or 'traditional' concessions, on one side, and 'administrative' and 'sponsored' concessions, on the other. The latter are usually labeled as PPPs In this report, the notion of PPP does not refer to specific legal arrangements, instead, we used PPP in the wider context to describe arrangements involving the public and private sector. Unless explicitly stated, we are not distinguishing between different types of concession when referring to PPPs.

- **The decision-making challenge**. Overall decision-making responsibility is a critical consideration in developing regulatory arrangements. High degrees of centralization is associated with a reduction in the transaction costs of making decisions, especially when decision-making responsibility is concentrated at the level of a regulatory agency. At the same time, such delegation of responsibilities comes at the risk of accusations of lack of political support and overall legitimacy. In contrast, highly dispersed responsibilities in decision-making lead to problems in achieving consensus.
- **The commitment challenge.** As private investment is said to be critical for capacity increases, the provision of appropriate financial incentives has become a central regulatory requirement. In particular, it has been argued that the high degree of asset specificity and the fixed asset character of logistics infrastructures make them especially vulnerable to different kinds of expropriation once initial investment has been made. Such expropriation can take the forms of outright contract cancellation without compensation to changes in the regulatory framework that threaten financial returns. This problem is particularly pertinent in situations where concessions have already been issued, but where demands for adjustment and flexibility collide with contractual rigidity.
- **The control challenge**. Experience with concessions highlights the considerable problems in oversight and monitoring. Such problems arise from contractual devices, from changing technologies and evolving states of knowledge over asset bases and other indicators. The extent of discretion granted to regulatory oversight bodies – and by whom – is therefore a critical design challenge.
- **The uncertainty challenge.** Logistics infrastructures are not necessarily exposed to changing technologies that make them exposed to uncertainties (in contrast to fast-changing sectors where the choice of technological standard might quickly become obsolete). However, expectations about future capacity demands are shaped by factors associated with degrees of uncertainty, such as geopolitical changes, modifications in trade patterns, competing locations ('logistics hubs') and alterations in societal and environmental expectations.

2.3. Regulatory capacity issues

There are also certain administrative capacity challenges that are associated with different forms of regulatory arrangements (Lodge, 2014; Lodge and Wegrich, 2014,):[3]

- **Oversight capacity:** This is defined as the capacity to oversee the activities of the infrastructure operator (and the other activities associated with the regulated entity). This involves capacities in terms of staffing, budgeting, authority and instruments.
- **Analytical capacity:** This is defined as the capacity to understand trends and developments linked to the future development of the sector.

[3] For wider discussion, see M. Lodge (2014: 63–85) and M. Lodge and K. Wegrich (2014: 1–22).

- **Coordination capacity:** This is defined as the capacity to work with other regulatory bodies as well as other actors relevant for the achievement of regulatory objectives.
- **Delivery capacity:** This is defined as the actual execution of policies/objectives. Partly this relates to the running of infrastructures in case of provider failure, and partly to the capacity of industries and other actors to adapt to regulatory requirement.

Chapters 3 and 4 of this report deal with the particular challenges in regulatory governance and capacity more specifically.

2.4. Public private partnerships and variations in logistic infrastructure projects

The last three decades have been characterized by a shift in the frequency and value of transfers from the public to the private sector. These have had an impact on the economic organization of assets, capital stock and production across countries (UNCTAD, 2013). The intended goal of privatization was to attract private investment as public sector budgets were depleted. The use of private sector ownership was intended to improve the quality of services, to increase access to infrastructures and to generate fiscal gains. However, these goals can only be achieved if private investment is actually willing to invest.

Large projects with considerable fixed asset characteristics are particularly vulnerable to market uncertainties: inherent uncertainties about future demand and technologies as well as concerns about changes in regulatory framework are said to impede the willingness of private actors to invest in logistics infrastructures. Regulatory governance therefore has to reflect the underlying sector and country-specific institutional endowment (Levy and Spiller, 1994: 201–46). Since the 1990s, there has also been a growing scepticism about the actual benefits of relying on privatization as a strategy. For some, positive effects from privatization depend on the nature of the project and the level of the power of the market in which it operates. In addition, an appropriate regulatory framework is said to be crucial for the success of privatization (Roland, 2008).

Privatization represents a policy bandwagon that has experienced great currency across network industries in the developed and lesser developed world. However, debates around so-called public-private partnerships (PPPs) have similarly attracted considerable attention. In particular, the demand for high quality infrastructure in the context of depleted public finances has increased interest in establishing various forms of combinations of private and public forms of financing, operational control and overall ownership (European Commission 2003: 4; OECD, 2009). More specifically, forms of PPP range from so-called build-operate transfer, design-build-operate to lease-develop-operate forms (UNCTAD, 2013). The continued involvement by government comes in the form of different in-kind or financial contributions, either through subsidies, guarantees, fees or availability of payments.

The economic rationale behind PPPs relies on the distribution of resources, risks and responsibilities, and rewards between the public and private sectors. The goal is to reduce public sector budgetary constraints. In addition, participation in PPPs is said to encourage the adoption of advanced technologies and increased efficiency in project delivery. In other words, governments are said to benefit from PPPs by obtaining better infrastructure services, lower immediate public investments and by transferring project

risks to the private sector. Contractual arrangements are supposed to also enhance accountability and transparency. However, for PPPs to be successful, it is important that governments have a clear policy framework that establishes priorities in terms of projects. It also requires capacity to assess the technical and financial viability of projects over the course of the contract. In addition, appropriate legal and regulatory frameworks are critical for the success of PPPs (UNCTAD, 2013, European Commission, 2003: 35).

There are a range of factors that have been identified as important in the success of a PPP initiative:

- Ensuring competition and avoid the creation of closed markets and selecting the right type of PPP set up (European Commission, 2003: 9).
- Creating of a 'watchdog' (role could be obtained by existing regulator) to ensure that good quality services are provided and public interest is protected (European Commission, 2003: 9).
- Careful assessment of required level of grant contribution so that the private sector does not gain undue profits, yet has an incentive to take the risk of entering a PPP (European Commission, 2003: 9).
- Active partnership with pre-defined flexibility to prevent abuse of constraints (European Commission, 2003: 9).
- Avoiding high transaction costs, information asymmetries and misalignment of incentives between the public and private parties – these are main factors that topple projects when allowing for unsolicited project proposals from the private sector (International Finance Corporation, 2005: 30).
- Careful assessment and provision of clear legal framework require the respective type PPP outlining rights and obligations across proposal development, award, and project implementation phase (European Commission, 2003: 35).
- Clear user fee policies and tariff levels and market/public/political support and financing for these (European Commission, 2003: 35).
- Efficient and streamlined decision-making and organizational processes with the help of a Special Purpose Vehicle (SPV) that ensures sufficient administrative capacity and consistency in decision-making across the administrative structures (European Commission, 2003: 35; Delmon, 2010: 38-39; Delmon, 2016: 168).

The actual experience with PPPs has been more sobering. In the UK, in the context of the Private Finance Initiative, it is said that PPPs have added around ten per cent to overall capital investment with a considerable decline since the financial crisis in 2008. Over the past two decades, numerous studies by the National Audit Office have highlighted benefits and costs of various PPP projects (NAO, 2006, 2011, 2012, 2013, 2015). In particular, one key insight has been that private finance has been more expensive than government finance (in the context of the UK at least) to achieve value for money. It is, therefore, essential that other factors than pure financial cost point to the benefits of choosing a PPP. Specific

challenges that have been identified relate to the long-term nature of contracts which limit flexibility, the lack of innovation in these contracts, limits on available performance data, and the inevitable reliance on a small number of competitors given the high (cost) entry barriers in bidding for these projects. Furthermore, risk has ultimately not been transferred to the private sector since governments remain owners of the risk overall. While not all experiences from the UK are directly applicable to the circumstances of Brazil, these insights highlight the highly complex nature of devising incentive structures and regulatory oversight arrangements in order to encourage sustainable development.

Variations in public-private partnerships

In view of the overall experience with public private partnerships to date, it is important to consider variations in arrangements, especially in terms of specific mixes in the financing and development of logistics infrastructure, as well as in ownership and access.

In Brazil, a range of institutional frameworks have been trialled to deal with PPPs. These include an inter-ministerial PPP Committee responsible for approving all federal PPPs; a PPP unit within the Ministry of Planning responsible for developing pilot projects and ensuring support from sectoral ministries; as well as a inter-ministerial Privatization Council, which was tasked with the approval of all privatization initiatives including concessions (World Bank, 2010: 35). The latter's effectiveness was criticized at the time (World Bank, 2010: 35). For example, a 2006 pilot road transaction (BR-116/BR-324 in the state of Bahia) was seen as solely led by the PPP unit and had no buy-in from other actors. The PPP unit gradually lost its relevance as a coordinating body was developed at central government level under the leadership of the Casa Civil (World Bank, 2010: 36). In general, PPPs in Brazil have been mainly a mechanism used by governments at the state level. It would be desirable if there was more expertise exchange between state and federal level.

Recent policy choices by the Brazilian government also indicate a clear preference for PPPs as the main vehicle for logistics infrastructure development. An underlying concern, based on past and present experience, is whether there is an alignment (beyond industry capture) between immediate industry demands and wider state and federal sustainable development objectives. Apart from the need for a strategic perspective, the context of Brazil is also particular in that specific private companies have relied on developing their own logistics infrastructure or have sought to own control of concessions to meet their own logistics needs.

Table 1 offers an overview of different combinations in terms of financing, development ownership and access rights across public and private actors that have been observed in Brazil. Without seeking to account for all variations or suggesting any preferred option, Table 1 provides a starting point to categorize the different models that exist in Brazil. At the same time, each one of these variants has distinct implications for wider social and economic development. Choice across these different dimensions in terms of financing, ownership and access has wider socio-economic implications for society since usage can be restricted to a small set of actors, can place asymmetric benefits and costs on particular market actors, the type of financing can have wider long-term costs for the taxpayer, and infrastructure solutions put in place can crowd out other options.

One dimension reflects on differences in the private or public sector nature of the financing and development of infrastructure assets.

- *Logistics infrastructure financed, developed by a private market actor; monopoly control of the asset and access*; access can be granted to other market actors and the public for a fee and asset can be used for various purposes (e.g. a privately owned train line used for passenger and cargo transport). An example is Vale, one of the largest mining companies globally. Vale is operating about 2,000 km of railroad network in Brazil and provides also logistics services to third parties via VLI (Valor da Logística Integrada); Vale furthermore operates long-distance passenger trains on two main stretches.[4]

- *Logistics infrastructure which has been exclusively financed, developed by the state and is publicly controlled with open access; fees can be collected for gaining access to infrastructure*; an example of pure public infrastructure are federal roads built and managed by DNIT (Departamento Nacional de Infraestrututa de Transporte), and one example of public infrastructure with tolls managed by the government is the EGR (Empresa Gaúcha de Rodovias).

A separate dimension points to differences in the degree of access and ownership of infrastructure assets.

- *Infrastructure assets are publicly owned but access is now granted to private actor in the form of a (quasi)-monopoly through guaranteed quantities/concession*; initial development could have also been done by private actors but the asset is now in full public ownership; one example is Rumo Logística which consists of four rail concessions in Brazil controlling 12,000km of rail tracks, around 1,000 locomotives and 27,000 railcars which are mainly used for transporting agricultural commodities and industrial products.[5] The company also controls around 19 million tons of lifting capacity in the Port of Santos.[6]

- *When it comes to developing greenfield assets* (or even expansion of existing assets) future PPPs planned in the logistics infrastructure sector in Brazil are mainly privately financed. Loans with subsidized interest rates from BNDES (Brazilian Development Bank) can still be involved and developed by private market actors. However ownership of the asset remains public and access is open for all market actors. One example is the Ferrogrão Railway.

[4] See Vale's website: <http://www.vale.com/brasil/EN/business/logistics/railways/Pages/default.aspx> (last accessed 13 February 2017).

[5] See Rumo Logística's webpage: http://en.rumolog.com/default_eni.asp?idioma=1&conta=46# (last accessed 13 February 2017).

[6] See Rumo Logística's webpage: http://en.rumolog.com/conteudo_eni.asp?idioma=1&tipo=27581&conta=46 (last accessed 13 February 2017).

Table 1: Typology of regulatory tools

Financing and development / Access and ownership	Public	Private
Public	Publicly financed, developed and owned, open access for all market actors; can involve fee for gaining access. Example: Federal toll road EGR (Empresa Gaúcha de Rodovias) and other roads under DNIT administration; Airports under INFRAERO administration; Ports under DOCAS administration	Publicly financed, developed and owned, but access is now granted to private actor in the form of a (quasi-) monopoly via guaranteed quantities/concession (initial development of could have also been done by private actors but the asset is now in full public ownership). Example: Rumo Logística train network.
Private	(Partly-) privately financed and developed, but ownership remains with public and open access for all market actors; can involve concession. Example: Ferrogrão Railway.	Privately financed and developed; full private ownership and monopoly access. Example: Rail network owned by mining company Vale.

3. Development of the regulatory framework and recent reform

Brazil has encountered considerable debate about the appropriate role of economic regulation since the mid-1990s following the creation of economic regulators. Since then, there have been repeated concerns about coordinating dispersed agencies from the centre and anxieties about undue intervention in agency decision-making. There have been high-level initiatives to enhance regulatory capacity, such as the PRO-REG initiative. More generally, the rise of the 'regulatory state' in Brazil has been associated with a range of economic policy debates. In this section, we offer a brief overview of the trajectory of the different sectors in Brazil. Our discussion focusses on the period since 1990 and highlights in particular the most recent changes, the creation of the PPI initiative in mid-2016 (Amann et al., 2014: 4–7).

3.1. Development of regulatory framework since mid-1990s

The development of the wider regulatory framework for logistics and logistics infrastructure since the mid-1990s can be distinguished in three phases (see Table 2). Some major changes in emphasis occurred in 2016 following the inauguration of the Temer presidency. In particular, the creation of a high-profile Program for Investment Partnerships (PPI) enjoyed high political salience and supposedly marked a move to a market-friendly regime. Initially, an Executive Secretar was created to coordinate PPI (not a ministerial-level appointment). In February 2017, Provisional Measure 768/2017 created the Secretaria-Geral da Presidência (ministerial-level appointment). The Secretary of the PPI was under this new post's authority.

The responsibility for developing Brazil's regulatory framework in the logistics sector is shared between the federal ANTT (ground transportation) and ANTAQ (water transportation) agencies and several state regulatory agencies. The responsibilities of state-level regulators vary across different states. Studies of regulatory governance by international organizations highlight similarities across Brazilian agencies. For example, according to the World Bank (Correa et al., 2006), the level of regulatory governance – as measured by a regulatory index (RGI-83) including measures for autonomy, decision making, decision tools, and accountability of regulators and institutional arrangements – is almost identical among different Brazilian regulators. However, there are variations between different dimensions of regulatory governance. For example, accountability and independence appear to be more developed in contrast to other regulatory instruments (e.g. regulatory tools) and decision-making procedures (e.g. those related to reducing discretion). Over time, these indicators suggest a development in formal provisions (such as political and financial autonomy). However, formal changes have not necessarily translated into de facto regulatory governance effectiveness. As noted below, the development of regulatory capacity does not

depend so much on the adoption of formal statutory provisions, but on the 'disciplined discretion' in decision-making, which, in turn, depends on autonomy and resources.

Table 2: Phases of development for main Brazilian federal independent regulatory agencies relevant for the logistics sector

1st Generation	
1995 – 1998	*Regulation type*: economic *Motivation*: privatization of utilities and liberalization of infrastructure sectors *New independent regulators*: ANP, Anatel and Aneel
2nd Generation	
1998 – 2001	*Regulation type*: social and economic *Motivation*: liberalization, controlling and risk management in social and environmental areas, and protection of democratic rights *New independent regulators*: Anvisa, ANA, ANS and Ancine
3rd Generation	
2001 –	*Regulation type*: economic *Motivation*: liberalization of utilities and infrastructure services *New independent regulators*: ANTT, ANTAQ and ANAC

Source: Cunha and Rodrigo (2013: 6)

3.2. Development of levels of private investment into logistics infrastructure

The Brazilian Privatization Programme (PND) started in 1990. Since then, private investment in logistics infrastructure in Brazil has fluctuated significantly over the past 25 years. The first phase between 1990 and 1994 included the privatization of existing state infrastructures. The national rail company RFFSA which was privatized during a second wave between 1995 and 2002. The PND also included other transport and logistics services and infrastructure (BNDES, 2002). During this period there was a significant increase in private highway investment as concessions were issued. Investments in ports rose after 1996 following the implementation of the Ports Modernization Act that gave states and municipalities the authority to enable exploitation of public ports.[7] Combined private investment in

[7]The law was approved by Congress in 1993 but only came into force in 1996 following the issuing of the presidential decree 1.886 (29 April 1996); see also World Bank (2010).

infrastructure as a percentage of GDP peaked in 1997 at 1.8% of GDP. At the time, this level was similar to the one of Chile (1.6%) and higher than Argentina and Mexico (0.1% and 0.2%, respectively)[8].

Investment levels in roads, rail and ports appear to rise and fall almost simultaneously, reflecting changes in overall policy emphases (World Bank, 2010). Between 1998 and 2007, private investment in roads remained at broadly low levels; during that period, there were two years that did not record any private investment whatsoever. Similar fluctuating patterns can also be observed in other South American countries; in Chile for example, private investment jumped from 0.2% of GDP in 2000 to 3.4% in 2001, only to fall down to 0.02% in 2003.

The implementation of the Growth Acceleration Programme (PAC) in 2007 marked a new period of concessions. Private investment in roads surpassed 1990s level. Private investment in ports also increased, but remained below the peak in 1997. In 2012, the Logistics Investment Program (PIL) was enacted. The PIL witnessed considerable increases in highway concessions. In rail investment, in contrast, the PIL did not have a significant effect at the national level (Globo.com, 2015). Following the recession in 2014, investment fell back to (roughly) pre-2007 levels, while other Latin American countries have maintained a somewhat more steady flow of investment (e.g., Mexico's investment has fluctuated between $750m and $3billion since 2008).

Brazilian infrastructure programmes 2007 – present

As noted, the Growth Acceleration Programme (PAC) was launched in 2007. Its central aim was to encourage development through investment in infrastructure. The first phase of the PAC (2007–2010) earmarked a R$104.4 billion out of a total of R$503.9 billion to spending on logistics. While popular, only 50% of the planned spending in the logistics area was executed. Moreover, the Federal Court of Accounts (TCU) established that at the intended completion of the programme, only 2,962 out of 13,653 projects had been completed. This represented a total of 16.14% of anticipated expenditure (TCU, 2012).

The programme was renewed with increased funding commitments in 2011. Expenditure levels were to rise to R$958.9 billion for the period 2011–2014. In this second phase of PAC (PAC 2), funding for transport projects was supposed to be R$104.5 billion – nearly double the amount spent during PAC 1. This programme was run in conjunction with the Logistics Investments Programme (PIL) which sought to encourage private sector investment in infrastructure through Public-Private Partnerships (PPPs) and privatization programmes.

Unlike PAC 1 and PAC 2, PIL was focused entirely on logistics investment. Its financial commitment amounted to R$133 billion. This programme did not meet its targets.[9] Six road sections were auctioned instead of the intended nine. Despite the goal of building 10,000km of railway track, not a single kilometre was actually constructed. There was also no investment in new ports. Furthermore, the road concessions were auctioned under a bidding system that encouraged 'low-balling' by bidders, requiring the state development bank BNDES to supply large amounts of finance to enable the funding of the projects.

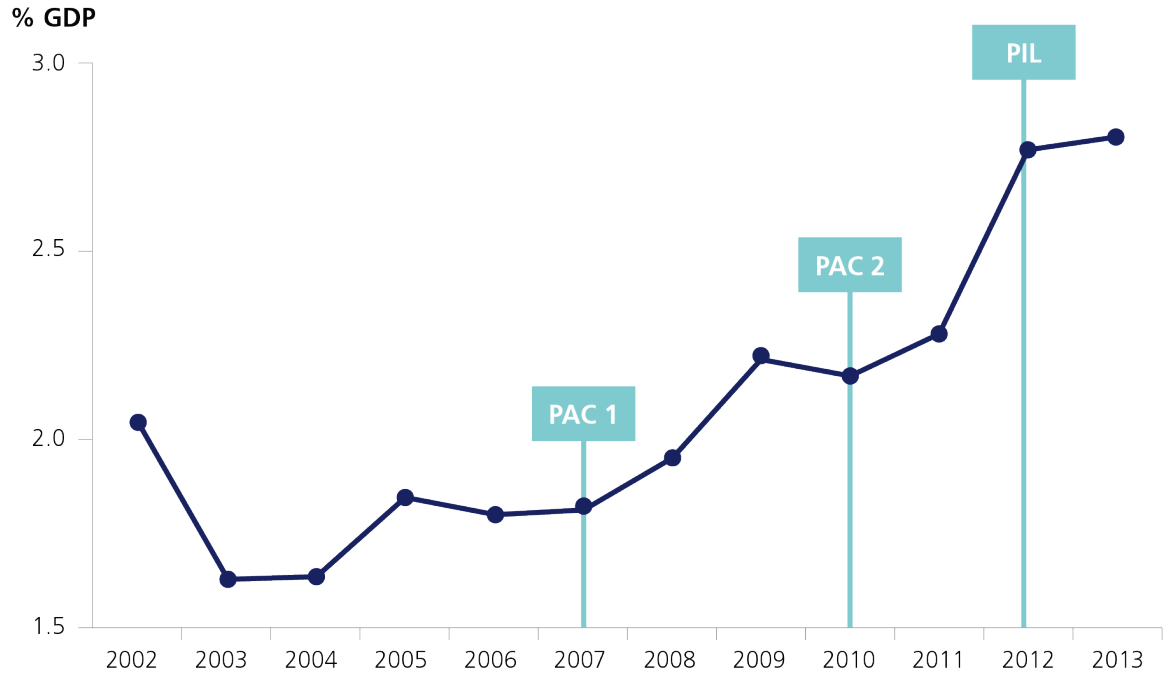
[8] See World Bank website: GDP at constant prices. <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=BR>

[9] But see Muniz (2016).

In response, a PIL 2 was announced in 2015 with an additional budget of R$69.2 billion for 2015–18. PIL 2 also contained considerable policy changes, especially in rail concessions. The funding role of BNDES was reduced and a greater involvement of private investment encouraged (Globo.com, 2012).

Following the change in government in May 2016, a new programme – the Investment Partnership Plan (PPI) was established. As discussed in more detail below, the goal of the PPI was to signal a more market-friendly infrastructure policy that was intended to open the market for concessions to new bidders, to encourage higher levels of private investment that would also contribute to the reduction of the government's debt burden.

Figure 1: Investment in infrastructure as share of GDP; Brazilian Ministry of Finance (2015)



Source: Secretariat for Economic Monitoring (2015)[10]

[10] See Secretariat for Economic Monitoring (2015): <http://www.seae.fazenda.gov.br/assuntos/regulacao-e-infraestrutura/infraestrutura-brasil/arquivos/brazilinfrastructure_edicao1-2015.pdf>

Table 3: Overview of PAC 1 and PAC 2

PAC 1
• Implemented in 2007 under President Lula • R$503.9 billion committed between 2007–2010 • Only R$395.8 billion of spending executed (around 60% of planned expenditure) • In logistics sector, only 50% of planned spending was executed (R$52.3 out of pledged $104.4) • TCU claims that outside of housing, only 2,947 of 13,653 projects included in the PAC plan were completed by the end of the Lula government which was the deadline for PAC 1 • Highly popular policy despite its low completion rate as the non-logistics section of PAC was hugely successful e.g. expanding electricity network
PAC 2
• Renewed version of PAC 1 that was implemented in 2011 under Dilma Rousseff and saw an increase in funding • R$ 958.9 billion the total planned expenditure for years 2011–2014 • Transport funding was R$104.5 billion, nearly double the amount executed in PAC 1 • Severely criticised for starting before PAC 1 had finished

Table 4: Overview of PIL 1 and PIL 2

PIL 1
• Started in 2012. Intended investment of R$133 billion in roads and railways – unlike PAC it does not contribute towards social projects and is focused on logistics • 6 of 9 planned road sections were auctioned, zero railway projects and zero ports started. • Programme was for concessions and PPPs • For roads, bid allocation on the basis of lowest toll, leading to 'low balling' • Railways auctioned (planned to build 10,000km) were for private companies to both build and maintain tracks and the state railway company VALEC to buy all the capacity and sell it on to prevent monopoly power • Most of the funding were BNDES loans to private companies with little private financing from capital markets
PIL 2
• Announced in 2015 with R$69.2 billion for 2015–2018 planned investment, with a further R$129.2 billion planned for the duration of concession contracts issued (up to 30 years) • Bidding of concessions for roads changed to a model where the highest cash bidder wins i.e. the company who pays the government the most wins the contract • Changes in railway building meant that an auction could be won by highest-value grants, lowest investment and 'sharing' • Planned to lease 50 areas for cargo handling in public ports and grant 63 permits for construction of private ports • BNDES reduced amounts of funding with subsidized interest rates of up to 45% for rail and up to 35% for ports; railway funding increased to up to 70% due to low private sector interest. • PIL 2 was scrapped by Michel Temer as some projects were not linked to partnerships

3.3. Programme for Investment Partnerships (PPI)

Some major changes in policy emphasis and institutional arrangements relating to logistics infrastructure were introduced in June 2016. The Brazilian Presidency issued the Provisional Measure 727/2016 which provided for the formal basis for the Programme for Investment Partnerships (PPI). PPI intended, on the one hand, to establish a regime to increase private investment in infrastructure projects, especially via public-private partnerships (PPPs.). On the other hand, PPI also intended to re-organize decision-making arrangements. The Provisional Measure 727/2016 was passed into law by Congress (Law 13,334/2016) in September 2016. It was subsequently amended by Provisional Measure 768/2017. Further significant changes were introduced as part of the provisional measure 752 which was passed in November 2016.

The PPI sought to address a number of critical regulatory governance aspects[11]:

- **It established newly constituted institutional arrangements**. Two new bodies were formed whose main responsibility was to advise the Presidency on new partnerships between private investors and the State: (1) the PPI Council, composed of the Chief Minister of the Secretaria-Geral da Presidência, the Chief Minister of the Civil House, the State Ministries of Finance, of Planning, of Mining and Energy, of Transport, of Environment and the Presidents of the Brazilian Development Bank (BNDES) and two publicly owned banks (CAIXA and Banco do Brazil) - other sectoral ministries and leaders of regulatory agencies can be invited, but have no voting rights-, and (2) the PPI Executive Secretary, was to act as the technical arm of the Council. The Executive Secretary was responsible for: (i) the standardization of the rules, (ii) gathering information, (iii) monitoring the modelling and the execution of partnerships, and (iv) harmonizing and integrating the activities of the regulatory bodies. The aim was that these two bodies would develop the central role of the PPI in logistics infrastructure and would play a coordinating, if not steering role in light of dispersed responsibilities.
- **It established guiding principles for PPI projects**. Guaranteeing stability (Art. 2, IV of the Law 13,334/2016) and promising 'highest legal certainty' (Art. 3, III of the Law 13,334/2016) were key elements of the new provision. These elements sought to address the diagnosed lack of confidence of private actors in regulatory and contractual arrangements. The role of the state was supposed to be limited to that of regulation and credit provision, with operational management being left to the private sector. The role of the BNDES was strengthened in terms of its involvement in project design (via the Support Fund for Structuring Partnerships (FAEP, Fundo de Apoio à Estruturaçáo de Parcerias), although its financial involvement was supposed to be reduced. Accordingly, BNDES continued to provide financial resources to private investors, but was also involved in providing technical capacity.

[11] See also Campos Mello Advogados (2016), <http://www.camposmello.adv.br/en/news-resources/resources/Brazilian-President-issues-Provisional-Measure-creating-a-New-Program-for-Public-Private-Partnerships-in-Infrastructure-Projects.html>

- **It tackled 'red tape'**. PPI sought to remove 'red tape' and enhance the transparency and stability of arrangements between public and private actors. The PPI also sought to encourage uniformity in administrative requirements (licences, authorizations, concessions).

The PPI provided for a significant attempt in addressing regulatory governance challenges (see next chapter). Most importantly, it sought to signal an openness to 'new' private investors. The central role of the PPI in the context of investment in logistics infrastructures was evident in the proactive nature in which decisions were taken over the second half of 2016. For example, this involved decisions on spotlighting a number of high priority projects, the renegotiation of concessions in the railway sector and the delay of concessions in the port sector.

In addition, Provisional Measure 752 of November 2016 sought to establish new incentives that were to guide concession renewal and termination. The measure emphasized the importance of credibility and stability. In terms of contract termination, the key problem was to establish parameters in which concessions could be returned. In cases where concessions had to be retendered, earlier concession holders were barred from bidding unless their share in a bidding consortium was less than 20 per cent. In terms of early renewals, the measure offered parameters for contract renegotiation (occurring if concessions achieved only 50 to 90% of their expected performance). Potential early renewals were subject to consultation and performance measures. Finally, the provisional measure also introduced alternative dispute resolution mechanisms in order to reduce the likelihood of costly court proceedings.

Taken together, PPI and supporting measures (such as Provisional Measure 752/2016) sought to address some of the diagnosed dysfunctionalities in existing concessions. The PPI signalled a strong emphasis on stability and credibility – supposedly reducing the scope for political micro-management, but also addressing perverse incentives that had encouraged 'gaming' by concession holders in the past. As discussed, the institutional arrangements build on earlier experiences, and it remained an open question whether the fate of the PPI would be different to earlier initiatives. These questions are addressed in the following chapter.

4. Regulatory governance

The goal of enhancing infrastructure capacity in Brazil was impeded by a range of obstacles, ranging from legacy effects to features of the political system which, at the time of writing (2016 2017), was going through a period of sustained turmoil, relating both to political personnel and inter-institutional relationships. Recent changes, as illustrated in the previous chapter, sought to address some of the underlying problems in attracting investment to enhance capacity. However, they only addressed the core challenges to some extent. The central challenge for Brazil in developing capacity to attract investment in its logistics infrastructure and to benefit from these capacity enhancements in sustainable ways was to develop regulatory governance and capacity. This chapter focuses on regulatory governance in particular. The subsequent chapter deals with regulatory capacity.

As noted, key challenges in regulatory governance can be distinguished across four key dimensions for regulatory design. Taken together, the way these challenges are responded to directly affects confidence in investment in infrastructures.

A. Decision-making challenge: the allocation of overall responsibilities in decision-making to decide on issues of regulatory design;

B. Commitment challenge: the capacity to overcome time inconsistency problems;

C. Agency challenge: the capacity to avoid discretionary behaviour by regulatory agencies that goes beyond initial intent;

D. Uncertainty challenge: the capacity to address underlying changes that affect the flow of benefits and costs across different constituencies.

In terms of *decision-making challenges*, logistics infrastructure investment in Brazil has traditionally suffered from a dispersion of responsibilities, leading to an overall confusion among private investors and other interested parties as to 'who' is in charge. Previous attempts at central coordination for those projects involving the federal government have led to accusations of agenda drift, over-centralization and micro-management. The latest attempt to introduce coordination and overall agenda control was, as noted, the creation of the PPI Secretariat with a direct link to the President. The Secretariat performed three central tasks: (a) to coordinate and lead on attracting investor interest by bringing together different ministerial departments, (b) to develop concession design, and (c) to attract (private) investor interest. Politically, the PPI was directly related to presidential attention; the President was chair of the PPI board. The ambitions of the PPI resembled previous attempts by Brazilian federal governments to develop central direction in face of diffused responsibilities. However, one key difference was the explicit commitment to promote

'new' competition and private investment in logistics infrastructures. PPI was also to become a 'certification' agency for state-level concessions.

PPI's role was affected by numerous interpretations regarding its appropriate role within the federal executive.[12] For some, the PPI was a central coordination unit that offered a challenge function to departmental plans for new or revised concessions and that promoted investment opportunities. For others, it was a central unit that was developing design and monitoring capacity in order to sideline regulatory agencies and departments. There were also differences in opinion about the appropriate allocation of responsibilities in concession design between ministries, the PPI and regulatory agencies.

At the time of writing, and perhaps not surprisingly given presidential interest, most respondents who we spoke to indicated that the coordination between involved departments and PPI was working satisfactorily. However, there were some significant challenges ahead. Firstly, the absence of an integrated national infrastructure plan meant that the prioritization of projects continued to be difficult. There were also calls for including wider regional development plans as part of infrastructure planning. De facto, the prioritization probably occurred as part of the work by the PPI in vetting ministry proposals and selecting priority projects. However, there were questions around the types of projects and their strategic purpose. There was among observers a general criticism about the quality of projects that had been traditionally put forward. Furthermore, there were some indications that the ministries concerned could be recycling old projects that had been sitting in ministry's drawers. In addition, the real strategic purpose of the PPI was not clear. For some, the central aim was economic development, for others it was revenue raising. At the same time, there was also a question of appropriate strategy, for example, whether 'quick wins' should provide for reinforcing trajectories, or that long-term strategic choices were required, thereby potentially delaying the development of different concessions.

Decision-making costs are however not just related to governance arrangements at the federal level of government. There were competing visions on infrastructure development priorities between the states and between the states and the federal government. For instance, a strategic industry in a given state may need a road or rail connection to run through another state to reach a port to ship from. To the neighbouring state the benefit of this investment may not be obvious and as such under the current governance mechanisms it may have limited incentives to help facilitate the development of this infrastructure. Moreover, our interviews suggested that different tax regimes at state level were said to discourage investment.

In general, there was an overall sense of concern about risk aversion being further facilitated by a fear of subsequent investigations, whether by the audit office (the TCU) or other watchdogs. Partly there was common agreement that an emphasis on review and accountability was important, especially in light of the challenges that the wider Brazilian political system was facing. Partly there was however also a concern about the impact on decision-making, especially in terms of potential implications of any arrangements in view of subsequent audit office (TCU) investigations. The presence of the TCU was partly seen as supportive for good decision-making. At the same time, the perceived threat of TCU investigations was

[12] See Provisional Measure 768, February 2017 (Presidência de la República <https://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/Mpv/mpv768.htm> (Last accessed 13 February 2017).

said to increase risk aversion in decision-making: It may not be wise to commit to decisions that may be subsequently be reviewed by the TCU or result in judicial scrutiny. A second issue spoke to the institutional independence of the TCU. Generally, it was deemed desirable to involve the TCU earlier in the discussions around concession development to enhance overall decision-making quality. This more immediate involvement normally took the shape of seconded staff. Some interviewees mentioned that this approach risked reputational damage to the TCU given its constitutional role as an *ex post* auditing body.

An organizational solution to the high degree of decision-making costs in view of organizational and jurisdictional fragmentation would be to treat each concession as a 'special vehicle unit' that would be promoted by the single 'grantor', the PPI. The idea of a special investment vehicle has been trialled in various international contexts. In the case of Brazil, it would require a harmonized tax rate for investment that stretched beyond state boundaries and could be promoted as an 'island of excellence' project which, ultimately, would offer incentives for government actors to design concessions on similar lines.

Reducing complexity via special vehicles is inherently attractive. However, it would inevitably face problems in light of the complexity of Brazilian jurisdictional politics. It also raises distinct policy problems. Special vehicles may have high administrative capacity but may become divorced from the rest of the administration. Learning that occurs in one special vehicle may not diffuse to the wider administration or other special vehicles. Some learning in Central and Eastern Europe suggest that special vehicles created to facilitate integration in the European Union did not improve the overall administrative capacity of the government in the long run. This was mostly because such vehicles are time-limited to a specific purpose; staff leaving the vehicle often left the domestic civil service altogether; and little knowledge transfer or wider socialization took place.

Alternative devices to support reduced decision-costs would include the adoption of protocolized decision-making frameworks (so-called coordination or cooperation protocols) that would seek to establish a clearer set of mutual understandings of roles and responsibilities among actors. Such protocols, however, would need to address the existing concerns among different actors, especially in terms of the relationship between the Casa Civil, the sectoral ministries and the agencies.

In terms of *commitment costs*, political instability was likely to continue for the foreseeable future. The present level of political instability was extraordinary (even for Brazil), but even in less turbulent times, political instability at the ministry level in particular raised issues regarding the consistency of political priority setting. At the same time, the need for infrastructure investment, especially in the area of logistics, was an issue that did not attract major partisan differences, although there were differences in terms of degree of reliance on private and foreign investment. The degree of consensus was evident in the lack of change in priority projects that have been put forward. At the same time, there was a wide-spread consensus that previous programmes had sought to micro-manage concessions due to presidential interests. This was not to deny the legitimacy of the political centre setting priorities, but earlier experiences had proven problematic in fostering a context of autonomous and responsible decision-making.

One key problem relating to commitment was the lack of organizational capacity at the ministry level. Whereas there seems to be considerable strategic capacity at the level of Casa Civil, the regulatory agencies (to a varying extent) and the TCU, ministries were identified as lacking capacity in a number of ways.

One, as mentioned earlier, was the lack of strategic capacity to distinguish long-term investment priorities from political convenience. The other was a lack of institutional memory in view of change in political personnel. Overall, ministries did possess technical capacity and institutional memory at an individual level, but continued staff fluctuations reduced organizational capacity. The adoption of the career of an infrastructure analyst was one measure to address capacity deficits. While this partly addressed capacity issues at the staffing level, it did not succeed in addressing wider organisational problems. The challenge for ministries was to develop organizational capacities that reflected the presence of individual expertise. In addition, reducing the administrative complexity for ministries to recruit staff from regulatory agencies may also advance ministerial capacity. Finally, as discussed earlier, political and economic instability may also lead to a degree of policy inertia where decision-makers either deferred decision-making to wait for new developments or were discouraged from making decisions due to current systemic factors (e.g. increased risk of review by prosecutors of any major investment decision).

A short-termist political outlook was likely to favour a 'quick win' approach (that might also appear convenient during times of budgetary austerity) than a strategic long-term approach. It is therefore important to develop approaches that lock-in key design choices so as to encourage reinforcing feedback mechanisms when it comes to concession design and overall logistics infrastructure planning. Such an approach will always be challenged by political processes that seek to introduce short-term and particularistic measures in legislative processes (named *jabutis* or 'small turtles' in Brazilian parlance).

One option to develop strategic thinking across government is the creation of an infrastructure commission. The example of the UK Infrastructure Commission was mentioned by a range of interviewees as a desirable option for Brazil. In view of the existing plethora of organizations involved in logistics infrastructure, the advocacy of another body seems somewhat problematic. The PPI might play such a role, but this would mean a growth in its size that would make it resemble earlier attempts at developing logistics infrastructures (under the PIL) which have been widely regarded as a failure. The creation of a strategic Commission would require the combining of existing expertise across departments and subordinate agencies. Strategic priority setting could be separated from the design of the concessions (by regulatory agencies) and the overall promotion of investment (by PPI) and be supported by other involved ministries, namely Planning, Finance and Transport. More generally, international experience highlights the problems associated with establishing units tasked with 'long-term' and 'strategic' perspectives. Short-term priorities and issues usually succeed in side-lining long-term considerations (Boston, 2017).

The example of the UK Infrastructure Commission offers further important insights. It was an attempt to divorce long-term strategic infrastructure planning from the inevitably more short-term political cycle. It attempted to provide certainty for investors over time. However, it is important to note that several bodies have performed this role in the UK over the years. Though political decision-makers clearly see the need for long-term strategic planning across different governments, the specific interpretation of the required institutional set-up has differed across governments. This again raises concerns in terms of commitment and long-term consistency. The presence of a supposedly autonomous commission does not remove political salience from concession decisions.

In terms of *agency costs*, there was considerable concern about the role of regulatory agencies in the process of designing and monitoring concessions. For some, it would be desirable to separate out overall responsibility for the design of concessions (to be undertaken by ministries) from its monitoring (by regulatory agencies). For others, ministries were seen as lacking capacity to design concessions appropriately. It was noted that monitoring concessions required understanding and engagement during the initial concession design. More generally, it might be argued that regulatory agencies were faced by at least two 'masters', namely the Casa Civil and the sectoral ministries. This raised issues about the appropriate role of agencies in decision-making by PPI – at present, they are able to attend (without voting rights). Others, in turn, advocated that ministries should be required to 'sign' concessions so as to take ownership of the nature of concession contracts.

Any relationship between ministerial department and regulatory agency raises questions about the appropriate distance of the two organizations from each other. Agencies are accused of 'drifting' beyond their mandate, focusing on the convenient rather than important or being too close to industry interests, in turn, departments are accused of risk aversion (and blame avoidance) by either neglecting agencies or showing micro-managing or -overseeing tendencies (see e.g. Bossert et al., 2000). The lack of good implementation could be for a variety of reasons such as the incentives of the agent, capacity, or an asymmetry of information. Incentives in this case would refer to an accountability relationship between the regulator and federal government, a clear policy framework, or the financial independence or stability for the regulator to provide good-quality services. A changing set of accountability relationships may result in an increased emphasis on how the federal government manages third parties effectively (e.g. performance management). In Brazil, debates about the quality of regulatory decision-making have occurred since the early 2000s. Interviewees had clearly established views about the quality of different regulators, in terms of the degree of their politicization and in terms of their technical decision-making. For some, regulators needed strengthening to enhance their autonomy; for others, regulators needed stronger (procedural) control to ensure consistent decision-making (including debate as to whom agencies were primarily accountable to). The key is to find a balance between supporting the autonomy of regulators and their capacity to deliver high quality services and to hold them to account. Brazil's arrangements encountered problems in both areas.

The capacity to monitor concession contracts is central to successful infrastructure development. Experience suggested that concession holders 'gamble': over-optimistic bidding reflected a lack of commitment to the terms of the concession as renegotiation on more favourable terms is seen as inevitable part of concession management. It is critical to develop a more structured approach that offers both flexibility and commitment. Concession granting needs to be 'credible' in allowing for failure, while also factoring in flexibility for adjustments given the long-term nature of the concession and inevitable changes in the environment of the concession. International experience has highlighted the difficulty with enforcing concession contracts (and transferring risk away from government), especially as the number of market actors is limited.

Enforcement of sanctions has been notoriously difficult in Brazil, not just in logistics infrastructures. While regulators (across sectors) diagnosed wrong-doing and issued notices, the actual payment of penalties has been highly problematic as regulatees resort to the court system. Such processes are extremely costly to regulators, do not rectify the diagnosed problems and do not offer immediate benefits to the user

of the 'service'. The electricity regulator (ANEEL) has attempted to address this problem by endorsing a 'responsive regulation' model that sought to encourage a more cooperative approach between regulator and regulated industries.

The Provisional Measure 752 sought to address the tendency of conflicts being dragged through the court system by introducing arbitration tribunals which could offer an alternative venue to judicial processes and potential benefit of short-cutting legal uncertainty. This, however, required acceptance by all parties of the judgements by these tribunals. It also required capacity to establish such tribunals – it was not evident that there was a long-standing tradition of capacity-rich tribunals in Brazil to deal with logistics infrastructure. This raised risks for the legitimacy of regulatory agency decision-making. There is the risk of creating a second-tier of regulatory decision-making if tribunals are not sufficiently resourced and supported.

Regulatory agencies were said to lack tools to address failing performance, even though sufficient information was said to exist. We also noted attempts at developing a better understanding by regulators of the needs of customers. However, these exercises in measuring customer satisfaction had, as yet, remained ad hoc and continuous oversight was dependent on available financial resources (which as seen as unlikely to be forthcoming). Recent reforms to concession regulation placed emphasis on outputs and outcomes, especially in terms of user satisfaction. Such performance-based regulation appears attractive, but required agreement on measures and reliable technologies of measurement. In view of resource limitations by agencies, performance-based regulation requires an early understanding between concession-grantor and -holder as to types of measurement and their financing.

To enhance regulatory oversight capacity, a range of tools are available. One central theme has been agency governance. Another long-standing initiative has been the rolling out of regulatory impact assessments. Discourse in Brazil regarding regulatory impact assessment has changed over the past decade. Whereas initially they were criticized as a tool of central control over agency decision-making, they are increasingly perceived as valuable tools to enhance agency decision-making.

Brazilian and international experience suggested that regulatory impact assessments 'withered in the heat' when they met strong political preferences. Impact assessments usually require time and resources that fly in the face of immediate organizational needs, and they may offer 'inconvenient' information to agency leaderships. Regulatory impact assessments can therefore offer a way of improving decision-making within agencies, but they should not be seen as a universal solution to enhancing regulatory decision-making, especially in view of often non-transparent demands placed on regulatory agencies by ministries.

At the time of writing, the Brazilian Senate had approved Bill 52/2013 and had passed it on to the Chamber of Deputies (PL 6.621/2016). The aim of this Bill was to enhance the governance of regulatory agencies. It granted, on the one hand, considerable autonomy to regulatory agencies by granting them individual budget lines and giving them discretion over some expenditures. The Bill also transferred budgetary and administrative account-holding to the Ministry of Planning, thereby reducing the role of sectoral ministries. The Bill sought to standardize decision-making across regulatory agencies by making Regulatory Impact Assessments mandatory, by enhancing standardised reporting requirements and by establishing rules for inter-institutional engagement across the executive. Most significantly, it dealt with questions of agency governance, especially in terms of the appointment of directors (it also prohibited re-appointment). It was suggested that any appointment should reflect a shortlist by an apolitical body that

was subsequently considered by the President and the legislature. Such a provision might reduce informal appointment processes that reflect the need for legislative coalition-building. The visibility of these processes might also have undesirable effects as nomination hearings might have a deterrent effect on potential applicants. At minimum, in order to ensure that nomination processes encourage strong applicants, it would be necessary for the different parts of the Brazilian federal state to agree on transparent criteria on which to evaluate the quality of candidates.

As noted, in view of wider investigations into the integrity of past decisions, decision-making was subject to demands for external scrutiny. As in other areas of government decision-making, the role of the audit office, the TCU, had become increasingly prominent in decision-making on logistics infrastructures. The TCU had increasingly become a 'meta-regulator' in challenging regulatory decisions. This role was seen by some as problematic as the TCU's views were seen as insufficiently reflective of the regulatory decision-making environment and focused on 'value for money' in particular. At the same time, the TCU had also become a 'helpful friend' in supporting (or 'protecting') technical decision-making against politically-oriented demands. The TCU was widely regarded as having more capacity than regulatory agencies. However, while the (voluntary or involuntary) meta-regulator role of the TCU could be said to offer additional expertise and consistency in decision-making, such a role sat uneasily with the overall jurisdiction of an audit body.

Earlier initiatives to enhance the quality of regulatory decision-making in Brazil, especially PRO-REG, organized at the level of the Casa Civil, had been seen as supportive of developing capacity-building measures and in identifying and diffusing smart practices. However, PRO-REG had also encountered the criticism that it emphasised presidential priorities rather than wider institutional capacity-building. Since the early days of the previous PRO-REG initiatives, regulatory capacity within different agencies could be said to have increased. At the time of writing, initiatives to create a new PRO-REG were being considered. In the future, initiatives such as PRO-REG should be directed at developing regulatory capacity more generally rather than deal with specificities of regulatory agency decision-making. A refreshed PRO-REG initiative should therefore focus on supporting the initiatives by regulatory agencies. This might require a separation of activities, ranging from centre-of-government 'better regulation' initiatives (located in the Casa Civil) to wider regulatory capacity-building activities organised through government agencies (such as ENAP, Escola Nacional de Administação Pública) that are not directly related to immediate political decision-making.

In terms of *uncertainty costs*, any long-term concession is prone to demands for renegotiation. There are inherent limitations when it comes to knowledge about the asset base of any investment, as economic and social demands change and so do technologies. The key challenge in Brazilian logistics infrastructure regulation was therefore to develop mechanisms that allowed for predictable and consistent renegotiations at fixed points, while discouraging a 'gambling culture' by concession holders that seek to renegotiate concessions on advantageous terms at any given point in time.

One initiative to address the diagnosis of a widespread 'gambling' culture was included in the temporary measure 752 which was introduced in November 2016. As noted already, according to this measure, concession holders that sought to 'hand back' their concession were excluded from entering subsequent re-bidding processes (unless their role in a bidding consortium was below 20 per cent). Such measures, if

applied consistently over time, might reduce the likelihood of continued gaming by concession bidders. However, it was debatable whether the measure was fully credible. The instance of rail where potential renewals of concessions were linked to revised quality standards offers a problematic example. While agreement on review clauses and oversight were to be welcomed, the intended granting of long-term concessions to existing concession holders flew in the face of the stated aim of attracting new investment and investors. The proposed system also required a rise in the number of potential bidders. Whether it was possible to attract new bidders under the terms of the new measure was yet to be confirmed at the time of writing. However, experience in Brazil (and elsewhere) highlight the problems of the incomplete risk transfer to concession holders, who will always have an incentive to seek renegotiation on advantageous terms.

Any medium to long term concession requires a set of indicators that allow for renegotiation – both in terms of failing and over-performance. Such a tramline approach has been trialled elsewhere but requires agreement between parties on sets of indicators and trust that the different parties are committed to accepting these indicators over time. It also requires an acceptance by the different parties that these review mechanisms are credible (i.e. poor performance cannot be discussed away by pointing to exceptional factors). Such 'tramlines' are also likely to incur inevitable gaming effects so as to discourage 'over-performance' by the concession holder. Finally, such an approach requires capacity by regulators and ministries to understand trends and developments.

In sum, much emphasis had been paid to the need to attract 'new' investment. This partly reflected the highly concentrated nature of investors that have traditionally held concessions in Brazil, it partly also reflected a response to concerns in Brazilian politics about issues of corruption (i.e. Operation Car Wash). Nevertheless, it is questionable, even in a period of relatively low interest rates, whether there was a field of international investors that is willing to invest in Brazil on terms that are favourable to Brazil. Ultimately, the proof of international investor appetite in Brazil will be 'in the pudding' of forthcoming concessions, but such uncertainty about potential investors places even more emphasis on the need for regulatory governance. In turn, this requires considerable attention to be placed on the design and operation of regulatory governance. Table 5 summarizes the discussion in this chapter.

Regulatory governance is at the heart of attracting investment for logistics infrastructures. Earlier approaches have been criticized for the micro-management exercised by the centre of government and for the perverse incentives set by domestic lending institutions. Whatever the current preferences in terms of facilitating investment and competition, there are long-term issues that require addressing. These are:

A. The need for a stable policy framework that allows for long-term planning and consistent decision-making

B. The need for a strategic capacity to develop logistics infrastructure that goes beyond the politically and administrative convenient.

C. The need to develop a clear understanding of the PPI (or any other central unit) as a coordinator of concession plans that promotes regulatory agencies and ministries in developing concessions

D. The need for appropriate resourcing of regulatory agencies to support the monitoring of concessions along agreed ‘tramlines'.

E. The need for a reputation among concession-holders that 'gambling' is not lucrative and that regulatory regimes are credible and not prone to ad-hoc renegotiation on the basis of political pressure.

Table 5: Regulatory governance: overview of challenges and proposals

	Proposal	Pre-requisite
Decision-making challenge	Creation of 'special vehicle unit' for each concession	Requires – harmonized framework overall – coordinative framework to support consistency – dealing with 'cliff edge' and staff continuity issues
	Creation of cooperation/coordination protocols	Requires -central oversight and support
	Institutional Overhaul	Requires -institutional overhaul should not simply add to existing complexity
Commitment challenge	Creation of 'infrastructure commission' to support strategy analysis and long-term commitment Develop ministerial capacity to deal with concessions and engage in relationship with agencies	Requires – Clear understanding of mutual relationships and responsibilities – Understanding that it does not reduce political choices and risk aversion
Agency challenge	Enhance regulatory capacity tools via appointment/procedural tools Allow TCU and other 'quality checkers' to provide challenge function	Requires – Understanding that external challenge does not increase risk aversion further – Understanding that procedures cannot be undermined by political/industry interests (e.g. insisting on 'penalties' for early withdrawals from concessions
Uncertainty challenge	Establish 'tramlines' as clear indicators for allowing review of concession contracts	Requires – Understanding on key indicators and agreement that 'gambling' culture will be discouraged.

5. Regulatory capacity

The PPI and related debates surrounding regulatory reform in Brazil focus on questions of credibility and commitment. In doing so, they resemble orthodox discourse that centre on capacity challenges of many of the existing orthodoxies on the role of regulation in furthering economic and social development. Orthodox accounts address on one key problem: how to assure private investors that their investment will not be expropriated at a future period in time. The literature refers to this phenomenon as the 'time inconsistency' problem, and regulation is to ensure certainty and address the perception that governments' preferences will be inconsistent over time. Low levels of long-term credibility are said to reduce investor confidence, therefore leading to lower investment in infrastructures and lower growth.

To offer credibility, orthodox accounts point to two potential prescriptions. One is to make contract reversal or review so costly that parties are unwilling to 'cheat' on contractual agreements once made. Long-term concessions have internationally been shown to be highly problematic as different governments contest the legitimacy of contractual arrangements, and concession holders are accused of not upholding the letter (or the spirit) of concession agreements. The second device to ensure long-term credibility is to create institutions that remove ongoing oversight over key infrastructures outside of the immediate reach of political attention and whose standing is politically difficult to reverse. Regulatory agencies have been established with considerable formal (statutory) degrees of independence.

More generally, the legal context in Brazil means that regulatory agencies will always be subordinate bodies, and therefore formal independence is inherently limited (as in other legal contexts, such as Germany). Since the creation of regulatory agencies at the federal level in the late 1990s, there have been concerns about the agencies' closeness to the regulated industries, their resourcing, consistency in decision-making and politicization through political appointment at director level. As noted, by February 2017, legislation (Bill 52/2013) had been approved in the Senate to address the governance of regulatory agencies, most of all in terms of appointment procedures.

To address these concerns, there has been considerable emphasis on introducing regulatory impact assessments across regulatory agencies in Brazil since the early 2000s. Over the past decade, the function of regulatory impact assessments has become more widely accepted across regulatory agencies, and agencies have become increasingly professionalized so as to be able to conduct meaningful impact assessment exercises. However, as elsewhere, the experience with impact assessments in Brazil has been patchy.

This study suggests that PPI's focus on credibility and commitment is unlikely to fully address the key challenges facing the regulation of logistics infrastructures in Brazil. The emphasis instead should be on the development of regulatory capacity. The wider literature on regulation has moved increasingly away from an emphasis on formal independence. 'Real' (or de facto) independence is said to differ considerably

from expectations that are based on the reading of formal statutes. Furthermore, independence has been usually defined by 'distance' from politics, but also has to be understood in terms of independence from regulated industries. The appropriate independence from politics and regulated industries ('capture') has been shown to be highly problematic in view of trade-offs in institutional design (for example, in terms of financing). There has also been a growing realization that regulatory agencies are involved in horizontal and vertical co-production of policies. Regulatory activities are therefore also about coordination.

In view of the limitations of a concentration on 'independence', increasing attention has been paid to the notion of 'autonomy' (Carpenter, 2010; Hanretty and Koop, 2013). Autonomy is defined as the space granted for discretionary decision-making and is a result of formal provisions, resources and social relationships or ties. In particular, autonomy emerges from the reputation for competence, in technical, performative, procedural and/or moral terms (Busuioc and Lodge, 2015). It also emerges as part of social relationships as autonomy is granted by the wider political and economic system, not by statutory provisions. Capacity is therefore about regulatory agency performance and its reception by networks of stakeholders, including regulated industries, politics, ministerial departments and other regulators.

There has also been a growing realization of the limitations of an emphasis on long-term credibility and commitment. Especially in complex industries with long-term characteristics, uncertainty over future states of the world is inherent. It is therefore essential to establish provisions that allow for renegotiating 'incomplete contracts', whether this is due to changing political and policy preferences, unexpected variations in demand, disruptions, technological changes, and industry developments. As noted, recent initiatives in Brazil regarding regulatory agencies and regulatory governance more generally raise the concern that there has been an over-emphasis on credibility and predictability. This reflects to some extent orthodox views in the literature (as noted). Partly this also reflects a reaction to a perceived hyper-centralization of political control in previous years, especially also regarding the activities of regulatory agencies in the area of logistics infrastructures. Past developments were said to have blurred the boundaries between ministries and regulators.

This emphasis on predictability risks coming at the expense of institutional provisions to enhance adaptability. The concern with the 'control' problem – how to avoid political interference and industry 'capture' at the very same time – has given rise to a debate about procedural methodologies and appointment procedures that are only helpful to some extent. The challenge, however, is that this concentration on control and predictability means that less attention has been paid to the need for regulatory coordination. As noted, the responsibility for concession-granting has traditionally been highly dispersed. The same holds for large projects, such as hydro-electricity where regulatory competencies are dispersed and approaches therefore lack joining-up. Survey work by IPEA (Instituto de Pesquisa Econômica) similarly highlights the limited extent to which officials within regulatory agencies engage with other agencies or their ministries.

An emphasis on predictability is nevertheless essential for establishing credibility among private investors. However, this predictability needs to be coupled with a stress on mechanisms to enable adaptability. As in all areas of life, nothing lasts forever. Concessions and other long-term contractual arrangements require agreed scope for adaptation to changing circumstances. These 'moments' for flexibility need to be based on agreed parameters and methodologies.

Table 6 offers an overview of four potential scenarios that emerge from different combinations of emphases on predictability and adaptability (see also Cunha et al., 2017).

Table 6: Four regulatory scenarios

	Emphasis on adaptability low	*Emphasis on adaptability high*
Emphasis on predictability high	**Extreme formalism**	**Disciplined discretion**
Emphasis on predictability low	**Irrelevance**	**Ad hoc responsiveness**

A high emphasis on predictability coupled with a low degree of adaptability leads to *extreme formalism*. This pattern has been widely diagnosed in Brazilian regulation with risk-averse regulators seeking to 'go by the book'. They did so without much prospect of actual effective regulatory remedy as decisions will be challenged in courts regardless.

There was also evidence of Brazil witnessing a high degree of adaptability coupled with a low degree of predictability (*ad hoc responsiveness*), especially in areas considered to be of high political interest. Some regulators in Brazil have also been associated with low degree of predictability and adaptability, thereby having hardly any relevant role in decision-making processes (*irrelevance*).

The desirable outcome is one of 'disciplined discretion' – that combines adaptability with an emphasis on predictability. It is unlikely that such a scenario can be hardwired through formal provisions alone. Instead, the notion of disciplined discretion illustrates an inter-play between individual and organizational resources as well as governance devices. Disciplined discretion therefore highlights the presence of a particular set of devices and capacities that provide for both, assurance to other stakeholders that their concerns will be processed competently, while at the same time, offering a degree of flexibility to adapt to changing circumstances. It is the assurance of 'disciplined' adaptability that allows stakeholders to grant 'discretion' rather than insist on 'hardwired' contracts that lead to inevitable conflicts over rightful interpretations. It also highlights the importance of collaboration and coordination rather than mere 'control' in regulatory activity.

The Brazilian context offers examples of such disciplined discretion, namely in the case of Anvisa (Agência Nacional de Vigilância Sanitária). As health surveillance regulator, the agency is involved in the certification of pharmaceuticals, chemicals and other potentially toxic substances. As a sector that has received considerable industrial policy-related attention, the 'health industrial complex' involves a variety of private and public organizations. This sector depends on coordination by and with Anvisa. The Productive Development Partnership (PDP) is an example of Anvisa's coordinating role in regulatory technical committees. Under PDP, diverse actors in the health domain, involving universities, laboratories and private companies, are brought together – also with view of subsequent patenting. Anvisa participates

in these partnership programmes from the outset. Its role supports regulatory stability and ensures overall compliance, but also reduces the scope for subsequence regulatory 'surprises'. In turn, through this process Anvisa acquires knowledge about developments that support its technical capacities. Engagement with this process has enabled Anvisa to become less insular in its approach without losing its capacity to make authoritative decisions. In fact, its credibility is said to have increased from its participation. A wider lesson from this example is the potential adoption of so-called coordination protocols that establish clear expectations regarding joint working across agencies and ministries.

Diagnosing regulatory capacity deficits

To develop conditions that allow for 'disciplined discretion', attention has to move from statutory provisions to a focus on regulatory capacities. Four distinct regulatory capacities can be distinguished - and they also offer distinct challenges in the context of Brazil.

i) **Analytical capacity**: the capacity to develop technical economic and other strategic analysis to forecast future developments and the develop concession bid documentations.

ii) **Coordination capacity**: the capacity to have an organizational structure that support the regulatory objectives and align dispersed stakeholders to enhance decision-making with regulators acting as 'boundary spanners' bringing together dispersed set of constituencies.

iii) **Oversight capacity**: the capacity to monitor and enforce provisions and also maintain a positive relationship with those overseeing you.

iv) **Delivery capacity:** the capacity to organize regulatory processes such as concessions and to run concessions should these fail.

These capacities are embedded in a wider context of leadership. Accordingly, leadership capacity involves autonomous leadership of a regulator that supports the overall objectives, creates a degree of organizational cultural cohesion and supports systems for continued delivery of regulator's objectives.

Deficits have been diagnosed across all these four regulatory capacities.

i) *Analytical capacity.* There was extensive analytical capacity present across different organizations, but none of it was fully aligned nor was there a belief in strategic thinking. Concerns were expressed about the lack of strategy in developing concessions. More generally, there was also scepticism regarding the quality of project proposals that had been put forward. Such deficits also pointed to a lack of challenge capacity. One such challenge function might be said to be provided by the BNDES. Furthermore, the TCU may be seen as one challenge function, but its activities were limited to those of audit. Elsewhere, institutional learning was said to be at best patchy and ad-hoc, with different organizations not necessarily being aware of others' experiences. In addition, the external challenge by the TCU was seen by many as generating risk aversion among other actors. Interviewees described a climate where the risk of TCU review or judicial action meant that decision-makers deferred making important decisions or putting projects forward for investment. Such an environment enhances risk aversion and therefore reduces the scope for the development of better and more strategic projects that support Brazil's sustainable social and economic

development rather than special interests. The test was to develop a healthy challenge culture within regulatory organizations and ministries.

ii) *Coordination capacity.* There was a widespread problem of multi-organizational sub-optimization. Different units within and across different organizations collected information and sought to support decision-making processes, however, responsibilities were dispersed. There was a general sense that the overall organizational structure remained fragmented and did not fully support the provision of effective regulatory services. This was the case for units within regulatory agencies and ministries and for governmental institutions more widely. Lack of coordination capacity existed in a formal sense in that there were insufficient mechanisms to support decision-making across the executive involving Casa Civil, ministries and the regulators. Coordination was based on often informal communication exchange (a traditional compensating mechanism in the Brazilian administration). At the same time, there was also an under-developed sense of coordination through communication. As the survey work by IPEA shows, regulatory staff rarely communicated with other organizations apart from the regulated industries (Cunha, 2017). The latest PPI developments stressed the importance of 'regulatory intelligence' across all bodies, but the development of such intelligence would need to develop responses to the inherent multi-organizational sub-optimization that characterized logistics infrastructure regulation in Brazil.

iii) *Oversight capacity.* Most regulatory organizations collected information and there had been a rise of risk matrices to monitor the trajectory of concession holders. However, the quality of the information was patchy and was still emerging. Budgetary constraints also meant that information collection was likely to remain haphazard. There was therefore ambiguity whether there was sufficient information – or sufficient capacity to act on information – to exercise credible oversight. Interviewees mentioned that the TCU was, at times, better placed to challenge concessions than specific ministries or regulators, not least because of a lower turnover of staff in the TCU compared to ministries and, in some cases, the regulators. There were well-established informal understandings as to the capacity of different ministries and regulators to exercise oversight, but no formal rating system or set of criteria for making such assessments existed. We do not suggest that such formal ratings and rankings would support oversight capacity, but note that there was a widespread understanding of varying oversight (and other) capacities across different organizations.

iv) *Delivery capacity.* There was inherent and widespread lack of faith in the long-time commitment of regulatory arrangements. There was therefore an entrenched lack of incentives among concession holders to fulfil the requirements of concessions. It has been argued that this 'gaming' approach towards concession varied by age of concession contract and across sectors. To reduce the incentive to 'gamble', delivery capacity was required to limit the occurrence of renegotiation-seeking behaviour to those genuine cases of agreed performance issues in which concessions either under-perform (and therefore may require less stringent provisions) or over-perform (such as making windfall gains that have little to do with actual business performance).

While much interest has been spent, in Brazil and elsewhere, on questions of independence, a renewed emphasis should be placed on leadership capacity. As noted, draft legislation in Brazil has sought to enhance procedural safeguards in the appointment of leadership positions among regulatory agencies. A high degree of agency leadership responsiveness to political concerns does not support the development of regulatory capacities, as discussed above. At present, agency decision-making was impeded by inconsistencies between the decisions made at leadership levels and the judgments of 'technical' staff. Inconsistency in decision-making or the lack of an evidence-base in decision-making also affected morale, leading to issues with organizational culture, and undermining the idea that staff, were working towards a common purpose. It also reduced faith in the use of regulatory instruments.

Tools for enhancing regulatory capacity

Table 7 highlights ways in which the diagnosed deficits can be addressed. These tools apply to capacity deficits across all areas discussed above. It is not suggested that all sectors should consider the very same tools; rather, reflection over how to introduce tools should be seen as part of overall capacity development.

Table 7: Enhancing regulatory capacities

Challenge tools Example: Utilizing elements of surprise to provide for challenge function	**Procedural tools** Example: Utilizing Regulatory Impact Assessments and coordination protocols
Incentive tools Example: Utilizing benchmarks and yardsticks to incentivise performance	**Engagement tools** Example: Utilizing third parties to engage with regulated concession

Procedural tools are supposed to enhance the consistency of decision-making. They are also intended to deal with the inherent tensions in the regulation of concessions namely between the demand for bespoke decisions dealing with particular conditions and circumstances, and the demand for high degree of centralized control so as to ensure consistency and control against capture by regulated industries and concession holders.

Regulatory impact assessments have been applied internationally and have featured as part of the debate about high quality regulation in Brazil for over a decade. We have already noted the limitations of regulatory impact assessments in the context of Brazil and elsewhere. To develop regulatory impact assessments towards a capacity-enhancing instrument it requires a systematic effort to 'score' impact assessments so as to make them stick within organizations. Regulatory impact assessments are widely seen as unhelpful when contradicting strong political messages (from director or ministry level), as they are seen to delay decision-making when urgent solutions are being called for, and the quality of impact assessments varies across topics and regulators. At worst, they can turn into tick-boxing exercises and make a limited contribution to improving the quality of policy making. They may be seen as another hoop to jump through, a simple exercise to validate or legitimate a decision that has already been made. For example, in

the European institutions, there were concerns about the centrality of impact assessments in the decision-making process and officials therefore started scoring the quality of impact assessments, a process managed by an Impact Assessment Board consisting of senior European officials with expertise in impact assessments. This process aimed to build in more accountability for those drafting impact assessments and improve the quality of the assessments, an evaluation of ex-ante evaluations. As such, introducing or the presence impact assessments may not lift the quality of regulation by itself.

Another, less well-established means to enhance regulatory capacity is the adoption of so-called coordination protocols. Not unlike Memorandums of Understanding, these procedural devices are supposed to establish mutual expectations as to jurisdictional boundaries, responsibility sharing and information exchange. Such protocols would have the advantage of granting regulatory agencies a more pronounced role in decision-making. It may therefore also facilitate regulatory agencies' capacities to take strategic decisions in view of wider governmental priorities and to utilize existing capacities within regulatory agencies more extensively throughout the decision-making. It would also provide for a device that would address the diagnosed 'inward-looking' focus of regulatory staff, as diagnosed by IPEA's survey work. At the same time, such protocols are also likely to encounter difficulties, one of which is the inevitable lack of organizational focus on maintaining ties with other organizations if no major interests are at stake. The other is that such protocols can lead to gridlock. Such issues can only be resolved by sustained organizational attention and support from central government units.

Engagement tools are supposed to enhance the knowledge-base for decision-making as well as overall legitimacy. They involve a range a methods in bringing in third parties to support regulatory activities. The purpose of such engagement tools is to strengthen the knowledge base and to disperse participation among different constituents. For regulatory organizations, engagement tools therefore offer two advantages, they reduce uncertainty due to increased information flows, and they offer tools to mediate between powerful actors. Engagement processes also require a willingness among actors to contribute throughout such process – and they require agreement on decision-rules.

Engagement tools range from formalized (and usually cosmetic) consultation exercises to negotiated settlements where affected constituencies directly negotiate with the regulated organization. Recent variants include customer engagement processes that involve direct, but regulated interactions between regulated firms and customer representatives. In (local) monopoly situations, these might involve the creation of a body that seeks to directly engage with the regulated company over certain issues, such as the regulated company's approach towards customer satisfaction, or over business plans that subsequently influence regulatory decisions. Satisfactory engagement processes can be 'rewarded' by light touch regulatory reviews. These engagement processes can only succeed if third parties are sufficiently resourced to hold regulated organizations to account and where regulated organizations are willing to engage in the process without considering alternative routes for achieving desired outcomes.

Engagement processes have been trialled in Brazil in the airport sector with, however, limited success as key stakeholders refused to contribute. This example points to a more general problem with innovative engagement strategies as they require the active involvement of different stakeholders and encouragement by political actors. Engagement processes also require regulators to become mediation organizations that support all parties with information that is seen as 'fair' by all parties.

Incentive tools are supposed to motivate actors to perform according to strategic objectives. Incentive-based instruments include, for example, the well-known price-cap mechanism in utility regulation (RPI-X) where the incentive to retain additional efficiency savings beyond the 'X' is said to motivate regulated industries, or market-based mechanisms, such as emissions trading. Other examples include league tabling and forms of naming and shaming. Incentive-based instruments require not just a motivation but also a capacity to perform among regulated organizations. Poor performance, as measured in league tables, can have perverse effects, such as leading to disillusionment and reduced motivation, therefore threatening performance further.

The lack of incentives in the current Brazilian set-up refers in particular to the perceived 'gambling culture' in some sectors (and among some set of contracts) according to which concession commitments are seen as hardly credible and open for renegotiation at any time. Public benchmarking of performance, taking into consideration differences in particular concession, would also give a degree of yardstick-type competition. It would also place public pressure on concessions to explain differences in performance.

Challenge tools seem to increase learning by advancing information processing within the regulatory process. Organizations are prone to filtering out inconvenient information and resort to established views of the world. Such defaulting on preferred interpretations about performance risks filtering out important information that effect future viability of concessions. One area in which challenge functions have been critical is emerging risks as regulatory organizations are supposed to be 'risk-based' in their focus (i.e. they devote their scare resources to those areas of highest probability and impact). It is essential to maintain a focus on emerging risks or 'low hanging risks' that might avoid detection and turn into 'high risks' in the future. Such surprises due to a lack of attention and the failure to spot threshold effects and other non-linear developments can never be completely avoided. However, providing resources to challenge existing perspectives and to explore emerging trends offers one way to reduce the likelihood of failing to detect changes.

The development of challenge tools might be impeded by the existing emergence of risk matrices in the Brazilian logistics infrastructure context. They also require a degree of institutional memory that might be present in the TCU and among regulatory bodies, but is arguably less the case in ministries. There existing technical knowledge has to be reproduced repeatedly given continuous political turnover. The PPI might offer a challenge function at the *ex ante* stage of the concession process, but to develop a better understanding about the performance *ex post* of different concessions, challenge functions need to be allocated elsewhere, namely within regulatory agencies that, in turn, need to communicate with their respective departments.

Mixes across these different tools are possible. They place certain pre-requisites on regulatory agencies and other actors that are centrally involved in concessions and other aspects of logistics infrastructure regulation. Table 8 (below) provides an overview of the ways in which different tools enhance regulatory capacities.

Separate from these tools to enhance regulatory capacities are instruments that are supposed to encourage desired regulatory conduct through incentive setting. One such device that received considerable attention in Brazil was infrastructure and performance bonds. The notion of an infrastructure bond has been widely discussed in international development circles. Current consensus suggests that infrastructure bonds offer

an advantageous way of enhancing investment in those areas where returns are certain. They might therefore be advantageous in those areas in Brazil where 'new' investment is least necessary. Performance bonds similarly face considerable issues – most of all, they relate to the high transaction costs in setting such contracts up, in dealing with inevitable squabbling over contract interpretation or in negotiating premiums. In other words, there will always be an incomplete risk transfer away from government.

A number of financial incentives have been trialled over the past decade in Brazil. For example, infrastructure-related securities were exempted from revenue taxes in 2011, with a more generous regime for institutional investors being established in 2015. Only few of such securities were however issued. This was said to be due to the high uncertainty associated with the construction of infrastructure projects, the wider political and economic instability affecting Brazil, better returns offered by Treasury-bonds, and a preference by local investors for short-term bonds (CNI 2015: 15–16). BNDES remained the largest investors in Brazilian infrastructure securities (CNI 2015: 62). Guarantees by commercial banks and insurers were to increase the attractiveness of these products (CNI 2015: 16), but increased transaction costs and the requirement to provide for counter-guarantees increased the financing cost overall.[13] The default of monoline insurance following the 2008 financial crisis also reduced the demand for long-term infrastructure bonds internationally (World Economic Forum, 2010: xi, 59).

One way to increase the attractiveness of long-term infrastructure bonds (or securities) might involve government guarantees. Such a scheme was adopted in Peru where bonds carry a government certificate of completion (OECD, 2015: 13). However, such a scheme is likely to prove costly for countries under fiscal stress (CNI 2015: 16). In the UK, government guarantees – lenders being guaranteed repayment in full on time irrespective of performance – were introduced in the context of the post-2008 financial crisis. One of the central challenges was to establish administrative capacities to evaluate projects on their specific needs.

Table 8: Tools and regulatory capacities

Tool	Analytical capacity	Coordination capacity	Delivery capacity	Oversight capacity	Pre-requisites
Procedural tool	Enhances structured information base for decision-making	Enhances procedural understanding for inputs and basis for deliberation	Enhances understanding of delivery options and overall feasibility	Enhances understanding of task	Requires resources and leadership tolerance

[13] Information based on interviews..

Tool	Analytical capacity	Coordination capacity	Delivery capacity	Oversight capacity	Pre-requisites
Engagement tool	Enhances broadening information base for decision-making	Enhances legitimacy by involving third party actors in decision-making	Enhances third party involvement in understanding actual needs by key stakeholders	Enhances third party involvement in monitoring and reduces regulatory demands	Requires understanding of regulator as 'mediator'
Incentive tools	Reduces search costs as organizations are incentivised to perform	Enhances comparative information provision to strengthen cross-organizational information	Enhances regulated organizational incentive to commit to particular targets	Enhances information base by comparative information	Requires yardsticks that are comparable and difficult to game, capacity to collect and analyse information
Challenge tool	Enhances detection of non-standard risks	Enhances discussion over performance	Enhances understanding of potential gaming by concession-holders/regulated organizations	Enhances understanding of regulated organizations' behaviours.	Requires resources and tolerance within organization for challenge function

As noted, infrastructure bonds are said to be more attractive for projects that have reached a certain stage of maturity, such as in cases where revenue streams already exist and can be used to back bonds (CNI, 2016: 16; OECD, 2013a: 29). However, this might reduce incentives for efficient project design and operation (OECD, 2013a: 59. Other means of accessing additional finance at lower cost would be to rely on International Financial Institutions (IFIs). This path has been utilized by Brazil in the past for large infrastructure projects that did not receive BNDES funding, for example, the development of Line 4 of the Sao Paulo underground system (IFC 2013: 64–66).

In this section, we have focused on regulatory tools as a way to build capacity. Developing administrative capacity does not happen overnight. It requires political commitment and sustained effort to build stronger formal and informal institutions. In all likelihood, it entails a strategic development plan that sets the main objectives and priorities over time. Countries have different trajectories of capacity-building given distinct administrative traditions, reform programmes, and institutional and policy contexts. Better

capacity contributes to better implementation of programmes and ultimately outcomes, but it is clearly not a sole determinant of outcomes. Other cultural, economic, political and societal factors (e.g. relationships between groups in society) also affect outcomes.[14]

Our work with the OECD indicates that public sector organizations that have had great success in implementing programmes have a range of capacities supportive of implementing their mandate. As such, these organizations focus not only on the outputs of their activities, but also on system-wide results (shared across public sector), societal results (shared across different societal actors such as civil society and citizens), and civic results (access to public services, resilient communities, voice of citizens in delivering services, and more choice in public service delivery).[15][16] These observations are confirmed by wider international experience.[17] The capacities they demonstrate not only focus on whether an organization is compliant with its own processes and objectives, but also on whether the organization assesses its performance against wider outcomes (agency, system-wide, and societal), and on whether an organization develops its staff and wider stakeholders, identifies upcoming challenges, and can adapt to users' needs.[18] The latter is critically important in high functioning organizations as it differentiates between organizations that are merely focused on process from those that think about their outcomes and impact. A further observation is that institutional development can be path dependent and administrative weakness can also be persistent. This ultimately may be a factor in how regulatory capacity may or may not develop in Brazil.

Proposals for reform

Brazil has experienced considerable attention for the development of regulatory agencies since the early 2000s. Most of these initiatives have focused on enhancing the predictability of decision-making and concern with regulatory closeness to industries on the one hand, and political interference with regulatory decision-making on the other. This focus on generating greater predictability has had implications for the development of regulatory agencies. Impact assessments and other tools (such as freedom of information and transparency initiatives) are said to have offered the opportunity to strengthen formal decision-making processes. In turn, they are also said to have encouraged a degree of risk aversion.

To enhance the regulation of logistics infrastructures, a greater focus should be placed on disciplined discretion as a mechanism that offers predictable and consistent regulation, but allow for adaptability to changing circumstances. To develop regulation towards disciplined discretion, we recommend a greater focus on distinct capacity demands and the utilization of distinct tools.

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[14] For a general reference, see Bouckaert and Halligan (2008).

[15] This overall framework is similar to the conceptual framework developed by Bouckaert and Halligan (2008).

[16] We do, of course, recognize that the building blocks for reform (inputs and procedures) are critically important and are not suggesting that the focus should only be upon outputs and outcomes. These examples are presented in order to provide context to our discussion of capacities within public sector organizations that have successfully delivered reform programmes that achieve improved outcomes.

[17] Some useful examples from Singapore and Brazil are given in Bourgon (2011).

[18] These capacities are for instance outlined in Bourgon (2011).

The development of tools to enhance regulatory capacity needs to reflect particular sectoral conditions and contexts. Nevertheless, in considering such tools, the following key concerns should be addressed

a. An emphasis on procedural tools should include mechanism of peer-review to develop blame-free learning environments to enhance quality. An emphasis on coordination should emphasise the importance of making agencies more outward-looking in their considerations and establish parameters for engaging with companies and other bodies in the executive.
b. An emphasis on engagement needs to consider the incentives for facilitating proactive and positive collaboration in order to reduce the tendency to use such mechanisms for 'gambling' and gridlock.
c. An emphasis on incentives needs to focus on the development of credible sanctions to discourage the extensive 'gambling culture'.
d. An emphasis on challenge tools needs to encourage learning rather than adversarialism.

6. Regulatory issues and challenges around logistics infrastructure per sector

A range of issues are associated with attracting private investment in infrastructure and running concession models. These are found in how assets are owned and divested from, the commissioning of new capacity, how the concession process is run, and how concessions are operated and overseen. These often result in a number of challenges. We described these in Chapters 2 and 4 as four main challenges: the decision-making challenge; the commitment challenge; the control challenge; and the uncertainty challenge. In this Chapter, we will explore some of the themes in Chapter 4 and 5 and look in some more detail at regulatory issues and challenges in four sectors in Brazil: rails, ports, roads and airports. We base our analysis on a document review and interviews in Brasilia with some key stakeholders in November of 2016. The airport sector is typically seen by some of our interviewees as a sector where concessions have worked better than in other sectors and good practice and wider lessons can be found. We will focus on the decision-making challenge, which reflects on the process of decision-making around concessions at governmental level. More information on the sectors including a wider description of the regulatory approaches taken in Brazil can be found in Appendices B-E. Table 9 at the end of this Chapter provides a summary overview.

6.1. Unbalanced transportation matrix and inefficiencies in logistics

Brazil was characterized as having an unbalanced transportation matrix and logistics inefficiencies that drove high freight costs and impeded Brazil's international competitiveness. The logistics inefficiencies were exacerbated by the distances between the main producing areas for commodities and sea ports. Transportation of commodities to sea ports for export remained a crucial part of trade and economic development in Brazil.

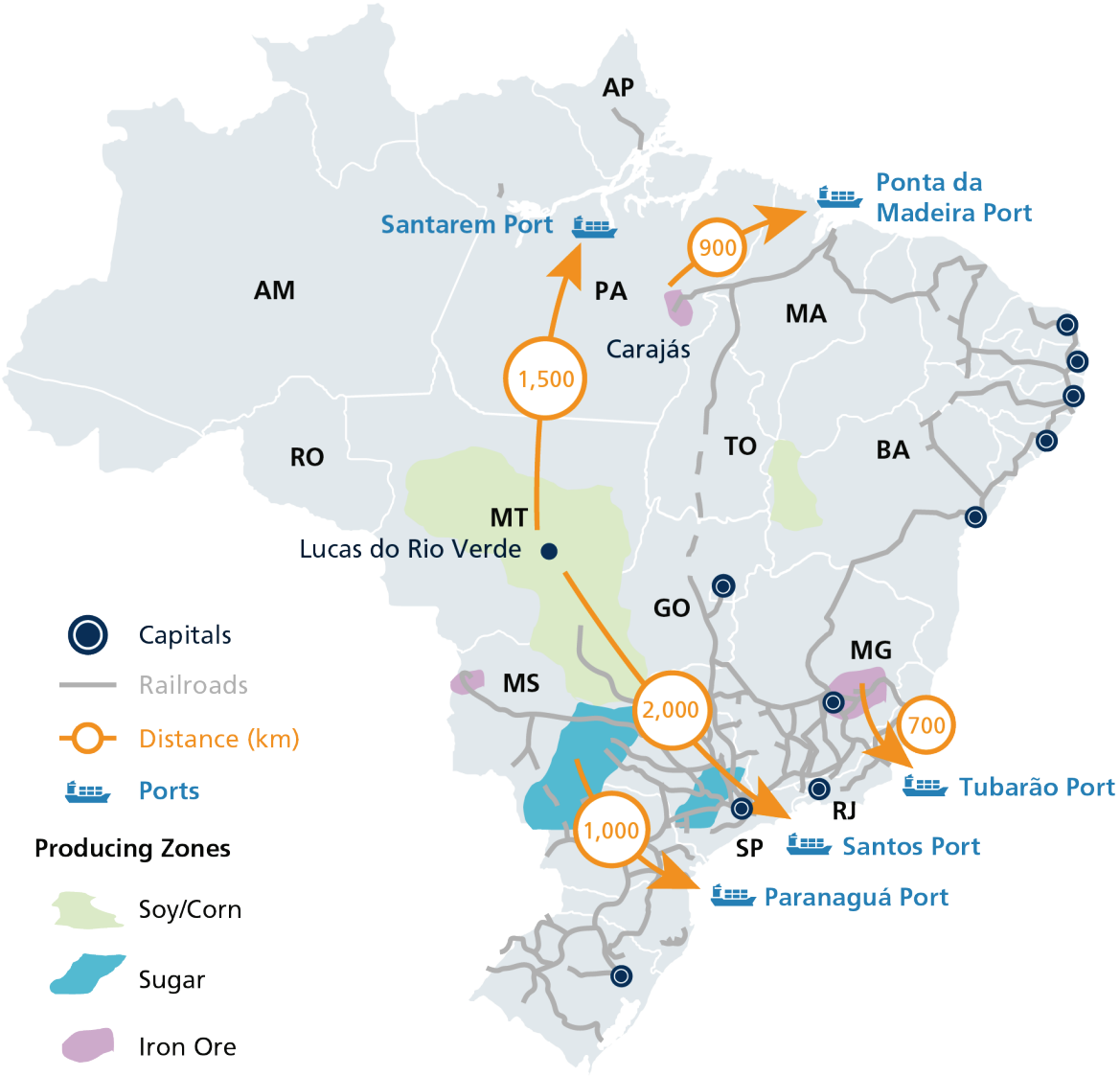
Firstly, general cargo transportation was heavily reliant on road transportation (accounting for 58% of total RTKs in 2013), which left Brazil with an unbalanced transportation matrix. High levels of investment in road development in the past along with underinvestment and lack of expansion of the railway network and inland waterways (as well as an underdevelopment of intermodal freight transportation) meant roads were still the preferred mode of transportation (either due to a lack of options and/or costs comparison with other modes).

Secondly, a lack of rail capacity and an overuse of roads contributed to creating overstrained system on key stretches leading to sea ports, in particular in the South and South East.

Thirdly, insufficient capacity of ports contributed to a situation where cargo was not transported to the closest sea ports available. For example, cargo that should be exported via ports in the North or North-East was transported to the South and South-East (*Economist,* 2013). This added to existing pressures on key stretches and bottlenecks in the South-East where interconnectivity was also a considerable problem.

Fourthly, network expansion remained a challenge (Moraes, 2010: 16; Gonçalves and D'Agosta 2010). Multiple systemic barriers remained to making these strategic investments (see sections below). For example, issues around the rights of access in the railway sector impacted not only on the variety of goods transported and general logistics interconnectivity but also on the value of concessions for operating parts of the network (e.g. stretches located more inland become less valuable for investors if access to ports cannot be guaranteed).

Figure 2: Overview of producing areas away from the coast



Source: Savaris et al. (2013: 9)

6.2. Rail

Regulatory issues

The Brazilian railway sector was (mostly) vertically integrated. Given the division of the wider network into regional areas and the past design of concessions, the spread of regional monopolies grew over time (*Folha de S. Paulo,* 2007). In the absence of considerable inter-running, vertically integrated railways are not necessarily a poor regulatory choice (the Japanese railways are vertically integrated, for example). However, vertically integrated railways raise the problem of negotiating (regulated) third party access (*Valor Econômico*, 2016a). In some cases, investors in the concession were agricultural producers or mining companies. These concession holders gave their products privileged access to the infrastructure.

In Brazil, concessionaires were mainly responsible for investing and maintaining the network besides operating the rolling stock. Over time, this model did not foster sufficient investment into new lines. Concession contracts often did not have an obligation to invest in new lines and investments made were focused more on most profitable stretches instead of increasing the extent of the railway network.

There was also limited incentive to maintain rarely used parts of the network. Across multiple concessions, the compounded effects of disuse was likely having a wider impact on overall quality of the whole network and were likely to trigger financial issues for governments once concessions ended.[19]

A further issue relates to attracting new and a diverse set of investors in railway concessions. The wider experience across South America was that several factors were limiting the attractiveness of the new private consortia and investors to increase investments in the sector. These included a lack of competition and transparency of concession design and procedures, and limited powers and independence of regulatory agencies, as well as the exposure of concessions to political and institutional risks (Bosch-Domènech and Montalvo, n.d.: 8-10).

Finally, there were a set of issues around targets for investment in a concession. Operators were typically only assigned responsibilities for managing the infrastructure, but not upgrading or expanding the network. In this type of design, there could be consequences for network capacity and velocity. Other network issues remained, such as limited integration between different stretches (different gauges), low quality urban crossings, and high sinuosity affecting operations of railways (Savaris et al., 2013: 56).

Regulatory challenges

In terms of the commitment challenge, there was in general a high rate of renegotiation across Latin American infrastructure projects and short intervals of about two years between the granting of a concession and renegotiation (Moore et al, 2014: 218–19). Looking at 124 transport concessions in Brazil, Chile, Colombia and Peru between 1992–2011 with a total of 399 renegotiations, Moore et al. (2014) found that almost half of the reasons for renegotiation were to alter the project's investment plan or schedule and compensation for the concessionaire due to exogenous changes in demand or costs, or due to previous government action 'in the public interest' (Moore et al, 2014: 217). The most common

[19] See TCU and court cases: TC 032.268/2013-0 and TC 008.799/2011-3.

outcomes of renegotiations were changes to the investment plan or schedule with concessionaires increasing the volume of investment in exchange for a direct payment from the regulator, an increase in tariffs or an extension of the contract et al, 2014: 218).

Looking at the control challenge, regulatory governance in Brazil had specific institutional shortcomings with high levels of fragmentation, blurred competencies and weak institutional leadership, as well as high involvement of judicial authorities and a limited use of regulatory tools (Cunha and Rodrigo, 2012). This also affected the ability of relevant government bodies to effectively monitor the railway concessions. ANTT as the main regulator was perceived as exerting less active participation in the sector and being more aligned with the oligopolistic market structure/regional monopoly model. The 2012 reform was thought to introduce the use of more specific regulatory tools, inspections, and reinforced mediation powers between concession holders and regulators (Savaris et al., 2013: 62).

Investments in concessions were likely to be affected by the current economic situation in Brazil and related political risks. The fiscal situation potentially affected public commitments to logistics infrastructure projects in the short, medium and long-run. The current unfavourable economic situation (high fiscal deficit, currency depreciation, etc.) was likely to result in cuts to public spending in the sector and endanger existing commitments. It was also likely to negatively affect investors' outlook with more expensive debt and limited possibilities to raise equity.

6.3. Ports

Regulatory issues

While capacity in the port sector had expanded since the 1990s and different models for ownership and operation of ports emerged, there was still a need for wider competition in aspects of the port infrastructure. Anti-competitive behaviour by larger port operators limited intra-port competition – an issue in the past was for example cross-ownership among terminals in the ports of Santos and Rio de Janeiro – which also affects the sector's attractiveness for investments by third parties (Correa et al., 2007).

Since the reform of the port sector in the 1990s, the issues of limited inter-port competition and an insufficient number of new commissions of 'greenfield' projects remained. Regulatory barriers hampered wider private investments outside of public ports, since private companies had to prove that they could handle a certain amount of their own cargo in order to justify investments in a new port (Savaris et al., 2013: 65). The government changed policy in 2008 with the Decree 6620, which restricted authorizations for building private ports to companies that could justify the investment for handling their own cargo only. Limited capacity expansion and saturation of the ports system was the result (Savaris et al., 2013: 65).

Several regulatory issues were related to the way concessions in the port sector have been designed. Concessions were issued to providers that manage public ports while approvals are issued at the same time for the development of new private terminals. Potential cost advantages of between 25 per cent to 35 per cent exist in private terminals due to the absence of key labour law restrictions. It can be argued that this incentivized private investors to pursue new private terminal development projects and expand wider capacity (Savaris et al., 2013: 72). However, an increase in private terminals projects also led to regulatory

disputes, which in the past forced the government to step in and limit private port expansion (see above; Savaris et al., 2013: 65). Furthermore, the need for sector oversight and strategic planning increased significantly. The sector operated under three main and very different models: public ports under government management; public ports with management assigned to the private sector; and fully authorized private ports. This raises questions around how to design fair competition among them given also very different situations in terms of access, interconnectivity, availability of intermodal transport solutions, and location compared to main production areas.

Another issue impacting on port management was the availability of skilled staff for port management and differences in salaries and labour rights across different types of ports. One of the key challenges until most recently was the lack of fully professional port management particularly in the public sector where levels of salaries could not compete with offers from private sector concession holders or private ports under authorization. Managers of public port authorities were frequently political appointees lacking adequate experience (World Bank, 2012b: 58). This also had consequences for the effective management and oversight of ports.

Regulatory challenges

A main issue related to commitment is the (early) renewal of concessions. Often concessions were renewed automatically or at times early. A risk was that early renewal allowed concession holders to renegotiate the original terms of the concessions. This sent a signal to the market that the concession process lacked transparency and fairness, which in turn could discourage a wider range of investors in the port sector.

Regulatory reform in the port sector between the early 1990s to early 2000s did not generate a well-defined institutional framework that could solve overlapping responsibilities of bodies across the sector (IFC, 2015: 19). This related in particular to: the role of the federal government with regard to planning, regulation and finance; the strategic underpinning and criteria for decentralization of port infrastructure to states and municipalities; the restructuring of the dock companies (Companhias Docas); the role and responsibilities of Port Authority Councils (Conselhos de Autoridade Portuária – CAP); and the purpose and viability of the Labour Management Unit (Órgão de Gestão da Mão-de-Obra OGMO) (IFC, 2015: 19). While the 2013 reform sought to restructure the institutional framework for the port sector, it was questionable whether this reform had led to a streamlining the administrative responsibilities of the sectoral administrative bodies. Therefore effective control continued to be a challenge.

In terms of the uncertainty challenge, the current economic crisis showed that the level and distribution of demand for port services was evolving. Though in general ports were getting busier, demand varied as some ports suffered more significant fluctuation in demand depending on the type of goods handled; some ports may be in the wrong places; some ports had an unattractive cost base. Several factors played a role including shifts in agricultural production; the price of commodities; discoveries and depletion of natural resources; and wider hinterland logistics infrastructure in Brazil (e.g. ports not well connected by rail or road).

6.4. Roads

Regulatory issues

Road privatization in Brazil was based on a concession model. Typically, federal auctions defined a minimum set of investments including maintenance and network expansion. Concessions were mostly given to the bidder that offers to charge the lowest toll tariffs (IFC, 2015: 16). The individual Brazilian states, which in total privatized their road network nine times more than the federal government, applied a similar model. However, some states awarded concessions to the bidder that offered the highest overall award value across a range of criteria such as the first round of road concessions in São Paulo (IFC, 2015: 16).

There were some specific regulatory issues in Brazil. Issues can arise when roadways cross the border of different administrative entities as this usually required consistency of policy typically between states. States could also adopt positions that potentially undermined future private investments. Some of the first state concessions had problems with attempts from state governments to reduce toll tariffs unilaterally without due compensation for private concessionaires. This occurred in the states of Paraná and Rio Grande do Sul.

Moreover, there were some barriers for using concession models for major network expansion. The concession model allowed for some incremental investments in network expansion as well as increasing the capacity of private toll roads. Many of these roads had high demand and gave a margin to the concession holder to make investments. When looking at the quality of private toll roads, the concession model seemed to be successful in fostering the improvement and maintenance of road conditions (IFC, 2015: 16). However the conditions for public toll roads and highways were significantly worse and indicated a lack of investment for maintenance.

In some cases this investment was not happening. Private toll roads with very low tariffs were regulated under performance standards. Investment targets did not succeed in increasing capacity of existing roads or expanding the network (Mourougane and Pisu, 2011: 24), partially due to the lack of quality of the viability studies undertaken during the planning phase. In other cases, the performance obligations were deemed as too strict and concessionaires sought for contractual amendments.

The emphasis of specific criteria in concessions by those granting the concessions was important (World Bank, 2010: 29). For example, for road concessions auctioned as part of PAC 1 at the beginning of 2007, the regulations allowed for the use of different auction criteria: (i) the lowest fare, (ii) the highest award value, (iii) the best technical proposal, or (iv) a combination of these criteria; the practice at the federal level was to focus mainly on the first criterion (World Bank, 2010: 29).

As discussed in previous chapters, international experience has shown that using the lowest fare as the main auction criteria can give incentives to those bidding to bid low potentially leaving the final contract holder in a poor financial position if subsequent toll revenues are too low. This in turn will then put pressure in due course for all concerned to renegotiate the terms of the concession. There are other options. Chile, for example, introduced a combination of minimum toll rate and highest grant value in the tendering of one of its toll roads. If two or more bids include the minimum rate, the winner will be selected based on the highest grant paid to the government (World Bank, 2010: 29–30).

Regulatory challenges

The commitment challenge relates to setting clear standards for how decisions on concessions were made during the lifetime of the concession. Some of the issues related to price rises. For instance, concession contracts could include a clearly stated adjustment factor for agreed prices to be increased in line with inflation in case inflation is crossing a certain threshold (World Bank, 2016: iv). Furthermore, concession contracts suffered from a lack of clarity around termination clauses defining how to end the agreement in the case of default or a prolonged force majeure event, as well as any potential compensation (World Bank Group, 2016: vii–viii). As mentioned earlier, the Brazilian government was, at the time of writing, reviewing how it was managing underperforming concessions, how to compensate concession holders for capital investments, and then re-tender these concessions.

The control challenge refers to a clarification of roles. A clear definition of the roles of ANTT and its relation to other government bodies was therefore crucial to enhance the existing regulatory framework. There was also an issue with political appointees in the leadership of the regulator. This speaks to the consistency of decision-making and adhering to the administrative processes put in place. Finally, we also wrote in previous chapters about using the information held by the regulator to foster more transparency around the performance of concessions and through performance measurement rating concession holders and holding them to account.

One of the main risks crucial to revenue and profitability of the concession was around future demand. While feasibility studies, demand estimation and the bankability of a project were provided at the outset, there were sets of measures that could be applied in order to mitigate against risks related to traffic revenue, for example: 'minimum traffic guarantees'; availability based payments (in full or in part); taxation relief; and concession payment relief during the early years of a project to offset the overall capital cost of the project (World Bank Group, 2016: ix). In other words, there could be ways to manage the uncertainty challenge and build this into the design of the concession. Some of this can be seen in the design of the 2017 round of airport concessions.

6.5. Airports

Regulatory issues

Airports were traditionally owned and managed by the public sector until 2010 (Steer Davis Gleave, 2014: ii). After 2011, a programme of privatization of major airports was started, however, with the state-owned INFRAEARO maintaining a 49 per cent stage. There was no restriction to the participation of foreign companies in concessions and ground handling, but there was a restriction for foreign companies owning more than 20 per cent of airlines (discussions to increase this share to 49 per cent were subsequently abandoned) (Steer Davis Gleave, 2014: 43).

A main regulatory issue was how to improve capacity. Many airports were reaching a point of saturation and new initiatives are focusing on expanding existing infrastructure instead of commissioning new sites (Steer Davis Gleave, 2014: 41). A further regulatory issue was the bidding process for the concessions. Concessions of airports were given to the bidder offering the government the highest grant and bidders on average bid 6.7 times the minimum expected value. This was seen as a measure of success. However, it

could also be seen as bidders purposefully overbidding to renegotiate later on, which, as stated before, impacts negatively on the competitive nature of the process (Guasch et al., 2015: 2). It could also signal to the market that the government undervalued the assets significantly, which have also impacted on the bidding process.

Regulatory challenges

The commitment challenge in airport concessions related to the large number of renegotiations that have occurred in airport concessions, despite the fact that concessions were granted only a few years ago. Most approved changes related to changes in the shareholder composition. Partly these requests were due to the effects of the 'Lava Jato' investigations. Requests in terms of 'rebalancing' the terms of the concession related to disputes over tariff clauses that had been initiated by the regulator (ANAC), falling passenger demand, and disputes regarding the obligations of the previous operator (Infraero). Nevertheless, this suggested that the concession process did not work as intended or that additional measures (as included in the current round of airports concessions) need to be put in place that assist in the effective management of the concession. The

As noted for other sectors, there may also be challenges related to control and oversight. The Brazilian regulatory framework for its airport and aviation sector underwent a considerable number of changes over the past three decades. Interviewees noted the complex nature of the institutional structures, lack of clarity in roles, inconsistent application of administrative processes, inconsistent decision-making. All this affected the design of concessions and have led to issues in concession oversight and monitoring, contributing to the relatively large number of renegotiations.

6.6. Cross-cutting themes

Table 9 provides a summary of our findings for this chapter. There are some main themes across sectors, which we will explore further here.

There were a set of regulatory issues in Brazil around:

- Getting sufficient infrastructure investment to improve capacity (Even with the concession model investments in network expansion and capacity improvements are often minimal and insufficient).

  There were broadly four main issues. Regional monopolies and oligopolistic market structures were common in Brazil and these market participants had little incentive to invest in network expansion and capacity upgrades. The incentives within the concessions were described in some detail in earlier sections of this chapter. A further issue was financing. Investments in infrastructure have benefited from low interest rate loans from the BNDES. Until recently, 100 per cent of debt PPP funding came from BNDES and PPPs in Brazil were therefore less attractive to commercial lenders from short-term perspective (World Bank Group, 2016: x). Given the fiscal climate this situation required change but the question was whether investments were viable using commercial loans. International lenders were also concerned about the lack of foreign exchange protection within PPPs, which presented a significant barrier to participating in projects

unless lenders had a local branch and were able to raise funding in local currency (World Bank Group, 2016: x). Finally, the level of abandonment of public works because of management failures and bankruptcy appeared to be high. While there was a current government initiative to increase insurance mainly using performance bonds in order to mitigate against this issue, there were concerns that these instruments increased transaction costs and require counter guarantees (*Valor Econômico,* 2016b, 2016c).

Table 9: Regulatory issues and challenges by sector

	Rail	Ports	Roads	Airports
Central issues	Lack of capacity, formal access provision and overall speed on network	Limited capacity and poor service quality; overlapping/ inconsistent legislative and regulatory framework	Poor condition & capacity of existing road network/inter-governmental differences among roads	Airport capacity and demand do are not well balanced
Ownership/divesture	Concession model	Authorization and concessions	Mostly public/ some private (concessions)	Concessions applying to larger airports
New commissioning	Primary emphasis on concessions of existing infrastructure with limited incentives for expansion	Expansion of capacity relies partly on new commissioning of capacity – question of whether access arrangements are open or restrictive	Limited options to expand ; variety of concession models	Mainly expanding existing airports
Concession/franchises	Attempted renegotiation of existing concessions – limited emphasis on capacity increases	Criticism of burdensome concession process/uncertainty of criteria	Pure reliance on tolls reduces incentives to invest in new capacity	Renegotiations could undermine levels of competitiveness and impact selection of bidders
Operation/ Management	Limited oversight – limited interest in inter-modal logistics	Service quality issues, questions of interoperability and inter-modal integration	Quality of maintenance	Public body remains involved as owner in concession raising questions around oversight
Commitment challenge	Public funding reductions given budgetary position/changing government priorities (preference for national vs private investment	Ensuring intergovernmental preferences are aligned. Competition between different ports	Certainty of concession agreements, changes in political preferences	Certainty of concession agreements, changes in political preferences
Control challenge	Problem of enforcing existing concessions in view of vertical integration/'cherry-picking'	Regulatory jurisdiction of ANTAQ/expertise	Information and monitoring of ANTT and other actors	Complexity of institutional structures
Uncertainty challenge	Freight loads dependent on overall economic development	Changing freight/economic patterns/ changes in 'formats'	Development of freight market in light of changing costs	Growing demand for air transport not met by capacity expansion

- Inconsistent policy making with regards to infrastructure.

  Frequent regulatory changes, the development of new government infrastructure programmes and high levels of political uncertainty impeded the wider quality of sector regulation. Between 2007 and 2016 Brazil had three presidents and started five different infrastructure programmes (PACs 1 and 2, PILs 1 and 2, and now PPI). These presidential programmes coexisted with other strategic plans on logistics, which were developed separately by ministries/secretaries and the regulatory agencies. All these programmes and plans had different timelines and scope, which created problems around prioritization and long-term decision-making.

- The complexity of regulation.

  Brazil has a relatively large number of rules and regulations. In 2007 Brazil had more than 3.5 million laws and regulations issued after 1988 at the federal, state and municipal level (Amaral et al., 2007: 32). ANTT alone accounted for more than 5,000 regulations, which could suggest that ad hoc decision-making was used to address individual problems without having a broader, long-term and strategic overview of all regulations in place.[20] There was a wider issue around obtaining environmental permissions, where sectoral regulators were often not set up to assist in this task and the burden falls on operators or concession holders. Red tape and high levels of bureaucracy have been also identified as significant factors for limiting levels of private investments in the Brazilian logistics infrastructure sector (Biedermann and Galal, 2013; Loman, 2013, KPMG 2012). This involved, for example, extensive paper work for obtaining licences and permits, time consuming import/export procedures, administrative difficulties when starting a business, registering property and land, as well as dealing with tax laws on municipal, state and federal level (Loman, 2013). The 2016 World Bank's Logistics Performance Index (LPI) scorecard shows that Brazil trials the region on a number of perceptions with regards to the quality of regulation. Only 10 per cent of respondents felt that they receive timely information on regulatory changes (28 per cent across the region) and only 12 per cent felt infrastructure regulation had improved since 2013 (32 per cent across the region).

There are regulatory challenges that relate to:

- Renegotiating concessions.

  There is a challenge in making concessions stick, getting concessions to perform as intended and signalling to the market that concessions are subject to effective oversight and can fail. The new Provisional Measure 752 from 2016 provided a legal tool for renegotiating concessions or returning failing concessions back to the government (allowing for arbitration to set the level of compensation for the concessionaire). However, it remained to be seen if this limited renegotiations or signalled to new investors that contracts will continue to be adjusted (*Valor Econômico,* 2016d).

- The complexity of the administrative set-up that can result in inconsistent decision-making and application of rules leading to insufficient oversight and control.

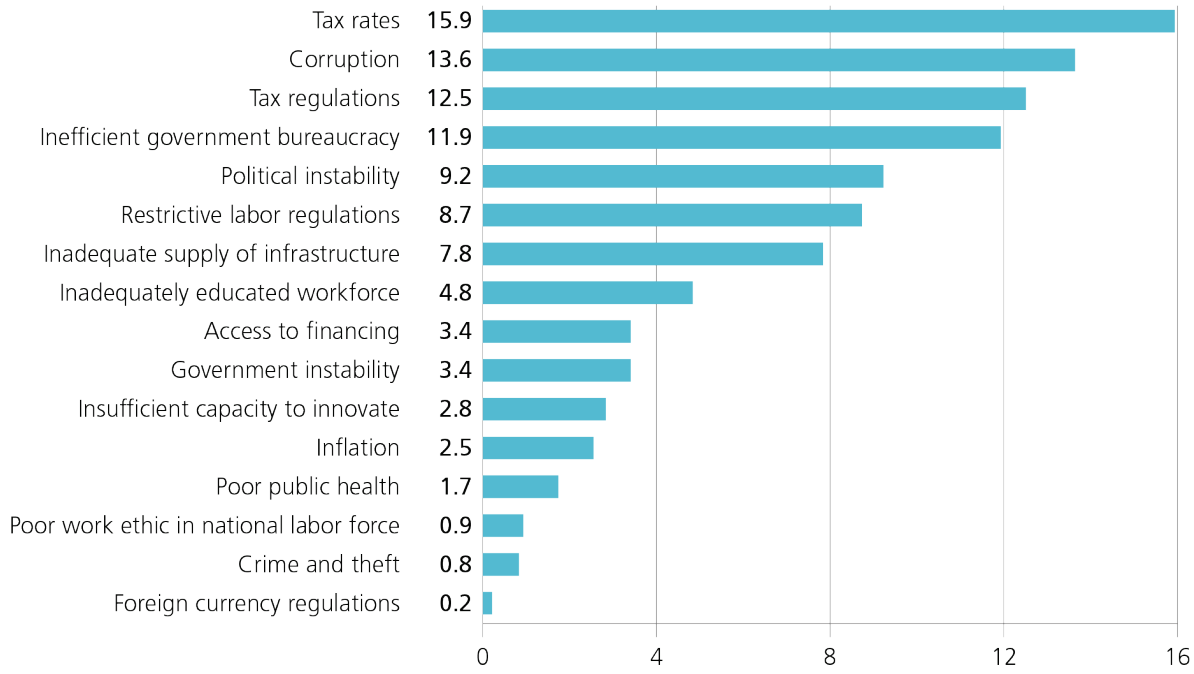
[20] Information from interviews conducted on 1 December 2016.

There were a number of issues with regards to the functioning of regulatory agencies. Overlapping responsibilities across sector bodies create issues around coordination and responsibility (IFC, 2015: 25). Various public bodies had overlapping planning and project development units (e.g. BNDES) and project management units (PPI). Decision-making by regulatory bodies like ANTT and ANTAQ were assessed as being exposed to the 'political influence' (Prado, 2013: 76). They were also seen to have less regulatory autonomy compared to other Brazilian regulatory agencies (de Paula and Avellar, 2008: 246). Furthermore, there was an inconsistent application of regulatory tools such as Regulatory Impact Assessments (RIA) with each regulatory agency adopting different models (de Castro, 2014: 332). Promoting regulatory consistency across agencies could help to improve predictability and quality of regulation (Cunha and Rodrigo, 2012; OECD 2012a). We discussed regulatory capacity and governance more specifically in chapters 5 and 6.

- The challenging political and economic environment made demand forecasting difficult. Options around managing that uncertainty risk can be explored in the concessions as to some extent has been done in the current 2017 round of airport concessions).

  The Global Competitiveness Index 2016–2017 found that tax rates, corruption, tax regulations and inefficient government bureaucracy, alongside political instability, are among the five most problematic factors for doing business in Brazil (see Figure 3 below). In addition, the economic environment makes demand forecasting in concessions more difficult. In the sections above, we discussed some options around managing the uncertainty challenge associated with economic forecasting.

Figure 3: Most problematic factors for doing business – Brazil



Source: World Economic Forum (2016a: 126)

7. Recommendations: towards a roadmap for enhancing regulation in logistics infrastructure in Brazil

1. Brazil requires investment in enhancing its logistics infrastructure. While there is universal agreement on this broad objective, there are debates about the appropriate regulatory and strategic means of obtaining investment and capacity expansion. This report has particularly focused on questions of regulatory governance capacity in logistics infrastructures.
2. Any recommendations need to be viewed in light of ongoing political and macro-economic conditions. Even when discounting current political uncertainty, the political cycle affecting the federal government in Brazil has stood in the way of long-term strategic decision-making regarding logistics infrastructures. Signalling credibility to private investors is about regulatory governance and capacity, but investment decisions (and the quality of these decisions) depend on the wider political and macro-economic constellations.
3. More generally, there have been noteworthy developments in seeking to address diagnosed regulatory governance and capacity issues. However, there remains a need for a more strategic perspective on logistics infrastructures. There was concern about the quality of the proposed concessions and their wider contribution to social and economic development. There is also a concern about the potential optimism-bias in attracting 'new' investors. International experience highlights the challenges with overseeing the quality of logistics infrastructure investments.
4. To enhance regulatory governance, there should be a wider dialogue between PPI, ministries and regulators about:
    a. The need for a stable policy framework that allows for long-term planning and consistent decision-making
    b. The need for a strategic capacity to develop logistics infrastructure that goes beyond the politically and administratively convenient.
    c. The need to develop a clear understanding of the PPI (or any other central unit) as a coordinator of concession plans that promotes regulatory agencies and ministries in developing concessions
    d. The need for appropriate resourcing of regulatory agencies to support the monitoring of concessions on the basis of agreed 'tramlines'.

e. The need for a reputation among concession holders that 'gambling' is not lucrative and that regulatory regimes are credible and not prone to ad hoc renegotiation on the basis of political pressure.

5. To enhance regulatory capacity, the overall emphasis should be on developing 'disciplined discretion'. Such an approach requires a relaunched relationship between ministries and regulators, and stable resource flows to regulators to encourage the repeated utilization of promising new avenues of measuring performance. In addition, there is scope for a renewed emphasis on a PRO-REG programme. Such a programme should enjoy highest level support in the government. In order to support the capacity-building by regulators themselves, it might be worth considering sharing responsibilities for PRO-REG activities across institutions, such as enabling teaching/learning activities to be organized through ENAP and applied research activities to be facilitated by IPEA.
6. More directly, a move towards regulatory capacity requires closer attention to the deployment of particular tools
    a. Procedural tools should be used to enhance the information base for decision-making and the quality of their application should be supported through review mechanisms.
    b. Engagement tools should be used to encourage less adversarial relationships with stakeholders and more informed decision-making, but will require a mediating and controlling role by regulators.
    c. Incentive tools should be used to discourage the widespread 'gambling culture' and benchmarking should be used to enable comparison across projects.
    d. Challenge tools should be encouraged to enhance the strategic quality of decision-making by drawing on the dispersed capacities within the federal government. However, such challenge functions should not lead to further risk-aversion in decision-making. This requires, therefore, the creation of 'safe spaces'.

8. Appendix A – Development of the logistics sector and related infrastructure between 1820s and 1990s

Following independence in the 1820s, the Brazilian government adopted policies for its wider logistics sector that relied on foreign direct investment (FDI). This policy was a response to a lack of domestic capital, expertise and technology. Concession contracts were the dominant form of contractual arrangement between private investors and state/municipal governments (Amann et al., 2014: 4–7).

A policy change occurred in the 1930s when the federal government started to become increasingly involved in infrastructure projects by taking on the responsibility for the granting of concessions from state/municipal governments. The decree, on which the new regulatory rules were based, was the Codigo das Aguas (Water Code), which regulated the water supply and hydro power sectors. It was subsequently used as a benchmark for developing regulatory standards in other sectors (Amann et al., 2014: 4–7).

Following this, and in line with the wider government's programme of import substitution-based industrialization, the 1940s and 1950s were characterised by the direct state-led provision of infrastructures. The private sector proved unable (or unwilling) to invest into the development and maintenance of infrastructures in view of strict regulatory frameworks and tariff-setting. The government also started a process of nationalization. This was particularly visible in the railway sector where the state created the Federal Railroad Corporation (RFSSA) in 1957, a development which was also mirrored in the electricity sector (Amann et al., 2014: 4–7).

The role of the Brazilian state as a main provider of infrastructure was facilitated by the development of the former's capacity to raise taxation and the post–1944 Bretton Woods arrangement, which provided the federal government with an access to special infrastructural lines of credit from the International Bank for Reconstruction and Development (IBRD). The decision to prioritize investments in the road network, while neglecting rail, was made by the then-President Juscelino Kubitschek. Part of this policy choice was informed by the decision to move the federal capital from Rio de Janeiro to Brasilia. While the decision is still considered controversial, others argue that it also facilitated the integration of the Amazonic region (Amann et al., 2014: 4–7).

The 1980s were a difficult period for the Brazilian economy in general and the infrastructure development in particular due to the debt crisis that the country experienced. This led to the abandonment of a large number of projects in the logistics infrastructure sector.

In line with the wider diffusion of more neo-liberal development-oriented ideas in the early 1990s the government adopted a policy of developing the logistics infrastructure sector by initiating privatization processes and assigning concession contracts. While there were positive implications on the infrastructure

network in Brazil, developments remained uneven. Some sectors like road logistics were doing relatively better than others, such as the railway transport (Amann et al., 2014: 4–7).

From the mid-1990s Brazil experienced unfavourable macro-economic conditions: low average growth rates, high rates of inflation and high interest rates, as well as exchange rate problems. Nevertheless, the consistently low rates of investment into infrastructure (between 2 to 2.5% of GDP) can be attributed to wider macroeconomic developments. Furthermore, the contemporary political crisis engulfing the whole Brazilian political (and industrial) class represents a major uncertainty for future investment.

9. Appendix B – Regulatory issues and challenges in the railway sector

Short overview of the railway sector

The railway sector in numbers as of 2015:[21]

- Total network: 30,567 km
- Broad gauge (1.6m): 6.533 km
- Dual gauge (1.6-1.0m): 510 km

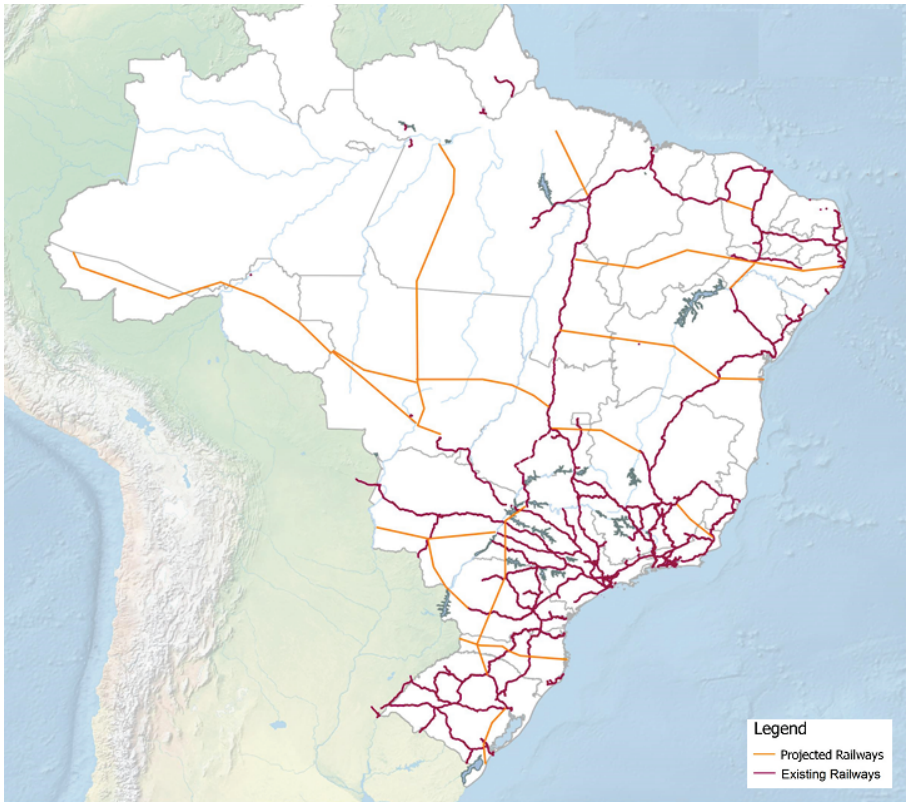
The development of the Brazilian rail network has suffered from a limited network effect, further hampered by the presence of different gauges, high sinuosity and a focus on road investment and imbalance in the transport mode mix towards cargo transport via roads (Savaris et al., 2013: 56). These historic issues persisted until the present day and they represented peculiar conditions on any regulatory intervention to ensure network expansion and integration with other transport modes. The railway network in Brazil was predominantly used for long distance freight transport and lacked significant capacity for passenger transportation, which was mainly restricted to a small set of urban and intercity train routes (*Economist,* 2012; export.gov 2016a). In fact, only 0.5% of all passenger transport was undertaken by rail, generating about one-third of all net operating revenue in rail transport (Banco Bradesco, 2016). Additionally, trains in Brazil operated at a substantially slower average speed (28 km/h). Its share in overall freight transport was also relatively low (25%) when compared to China (37%), Canada and United States (46%), and Russia (81%) (see also Figure 4 below; Savaris et al., 2013: 59). Occasional urban crossings (level crossings and railroad crossing densely populated areas) also forced trains to reduce their speed to 5km/h, which further impacted railway productivity (CNT, 2015a). Additional delays were attributed to the absence of appropriate transhipment solutions, especially closer to sea ports.[22] The lack of adequate railway network extensions over time was also a source of dissatisfaction among businesses (IPEA, 2010). While in the US there were 21.3km of rail per 1000 square km of land area, this rate was about 3.4 km in Brazil (Amann et al., 2014: 15; ANTF, 2011), a rate which decreased to 1.3 km when only taking into account private concessions with extensive traffic (Savaris et al., 2013: 59). Overall, the operating network was around 29,000 km (Caldas et al., 2013; Savaris et al., 2013: 58) ,

[21] ANTT (National Agency of Terrestrial Transport) (ANTT), 'Ferrorviária', <http://www.antt.gov.br/index.php/content/view/4751/Ferroviaria.html>

[22] TCU, 'Situações problemas portos, ferrovias e infraestrutura hídrica. Planejamento das ações de controle' (unpublished paper).

with approximately 23,000 km in actual operation (Smith, 2015), and only 11,000 km being extensively used (Savaris et al., 2013: 58) Interconnection between different parts of the network was a further problem. Different gauge sizes represented significant obstacles for network inter-operability. In turn, the lack of inter-running between networks reduced the attractiveness to private investors and concessionaires (Sampaio et al., 2015: 15). The network was also highly concentrated in the South and South-East,[23] as well as around the coastal areas, with only about 17%[24] of railroads being located in the North and Central-West areas.

Figure 4: Map of existing and projected railways



Source: Authors using data from ANTT (2017).

The main driver for rail network expansion has been the transport of commodities. No major consideration was given to the promotion of an integrated transport network across the different parts of Brazil. The lack of an integrated vision of the rail network persisted until the present day as vertically integrated companies abandoned parts of their network where these no longer were of commercial use or where these networks failed to link up to major production areas.[25] Concessionaires had furthermore limited interest in investing in the expansion of the network in areas in the absence of major economic

[23] Defined as Rio Grande do Sul, Santa Catarina, Paraná, São Paulo, Minas Gerais, Rio de Janeiro, Espirito Santo, Mato Grosso do Sul and Goias states.

[24] Calculated using data from the ANTT, <http://www.antt.gov.br/index.php/content/view/4751/Ferroviaria.html>

[25] More than one-third of the ALLMS Railway is idle due to the prioritization of segments leading to the Port of Paranaguá (PR) (*Valor,* 2016a).

interests. As a result, there was a long-term decline in network capacity and a decrease in the role of the rail network across all transport modes – Brazil had 38,287 km of tracks in 1960, this declined to 22,123 in 1990 (Bosch-Domènech and Montalvo, n.d.: 2). Nevertheless, railway productivity modestly increased in the recent years.[26] Overall, the railway network was characterised by regional networks with very few points of interconnection. Concessions were vertically integrated and the overall market structure was best characterised as oligopolistic with only a small number of market participants (Savaris et al., 2013: 60; Caldas et al., 2013: 3–4). The prospect for intra-model competition in rail is inherently low – and the same held for Brazil. Competition, if it existed at all, was inter-modal with approximately 60% of all freight being transported by road (OECD, 2013b: 11). [27]

Clear differences existed in terms of the types of goods that were transported across the different modes. Minerals (mainly iron ore) were mostly transported by rail by mining companies (Savaris et al., 2013: 9). Even though soybean and maize (corn) were among the three main products that were transported by rail, road freight amounted for 60 per cent of agricultural good transport.

Soybean exports offered a good example of the competitive disadvantage of rail due to the lack of infrastructure. Brazil was the second largest soybean producer in the world, only behind the US.[28] Savaris et al. (2013: 59) compare the export costs of both countries stating that:

> A comparison between the logistics of soybeans in Brazil and in the US shows that the lack of adequate railroad infrastructure has a major impact on competitiveness. In Brazil, 82% of soybean volumes flow through highways while railroads account for 16% and waterways, for 2%. In the US, these modes of transportation account for 25%, 35% and 40%, respectively, which is a much more efficient matrix in terms of cost efficiency and CO2 emissions. As a result, ground transportation costs in Brazil account for 44% of soybean price compared to 26% in the US.

Soybean production in Brazil increased by 63% over the past decade,[29] whereby railway capacity remained limited and faced strong competition from other transportation modes. Expanding and utilizing the railway system for the transport of low value-added cargo could lead to efficiency gains in transport costs when compared to other modes of transportation. The broad indicators described above highlight an underdevelopment of the railway sector. Investment into the expansion and improvement of the network would improve the quality of service (CNT, 2015a).[30] Further crucial issues to be discussed below include improving network access for a wider range of market actors.

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[26] According to the CNT Railway Report 2015 railway productivity is said to have increased by 28.9% between 2006 and 2014; one contributing factor is that while the trains decreased in numbers during that time they also increased in size.

[27] See also FIESP webpage: 'Cargo transport has five types of modes, each one with their own costs and operational characteristics, that makes them more appropriate to certain types of operations and products. All modalities have their advantages and disadvantages. Choose the best option, analysing costs, services characteristics, possible routes, transport capacity, versatility, safety and speed' <http://www.fiesp.com.br/transporte-e-logistica/modais-de-transporte/> as well as <http://az545403.vo.msecnd.net/uploads/2012/05/modais-transporte.pdf>

[28] See the Embrapa website of the Brazilian Agricultural Research Corporation: <https://www.embrapa.br/soja/cultivos/soja1>

[29] Historical data from Conab (Companhia Nacional de Abastecimento), 2017: <http://www.conab.gov.br/>

[30] The report attributes the low quality of services to the frequent passing of trains through urban areas where trains are required to reduce their speed from 40km/h to 5km/h.

From a wider perspective, underinvestment in the railway sector (see also Figure 6 which indicates low rates of investment over time) had an impact on overall freight costs and thereby contributed to the lack of Brazil's global competitiveness due to an over reliance on roads as the main mode of transportation (ANTF, 2011: slides 36-38). Brazil was ranked 93th among 138 countries in the Global Competitiveness Index 2016-2017 regarding the quality of its railroad infrastructure (World Economic Forum, 2016b).[31]

The railway sector was performing poorly when it came to fees, quality of infrastructure and quality of services. Survey responses from the 2016 World Bank's Logistics Performance Index (LPI) scorecard offer some insights into the performance of the railway sector in Brazil (percentages are compared with averages from the region, Latin America and Caribbean):[32]

- Level of Fees and Charges – rail charges: % of respondents answering high/very high 36.36% (27.66%)
- Quality of Infrastructure – rail: % of respondents answering low/very low: 81.82% (85.96%)
- Competence and Quality of Services – rail: % of respondents answering high/very high: 0% (3.66%)

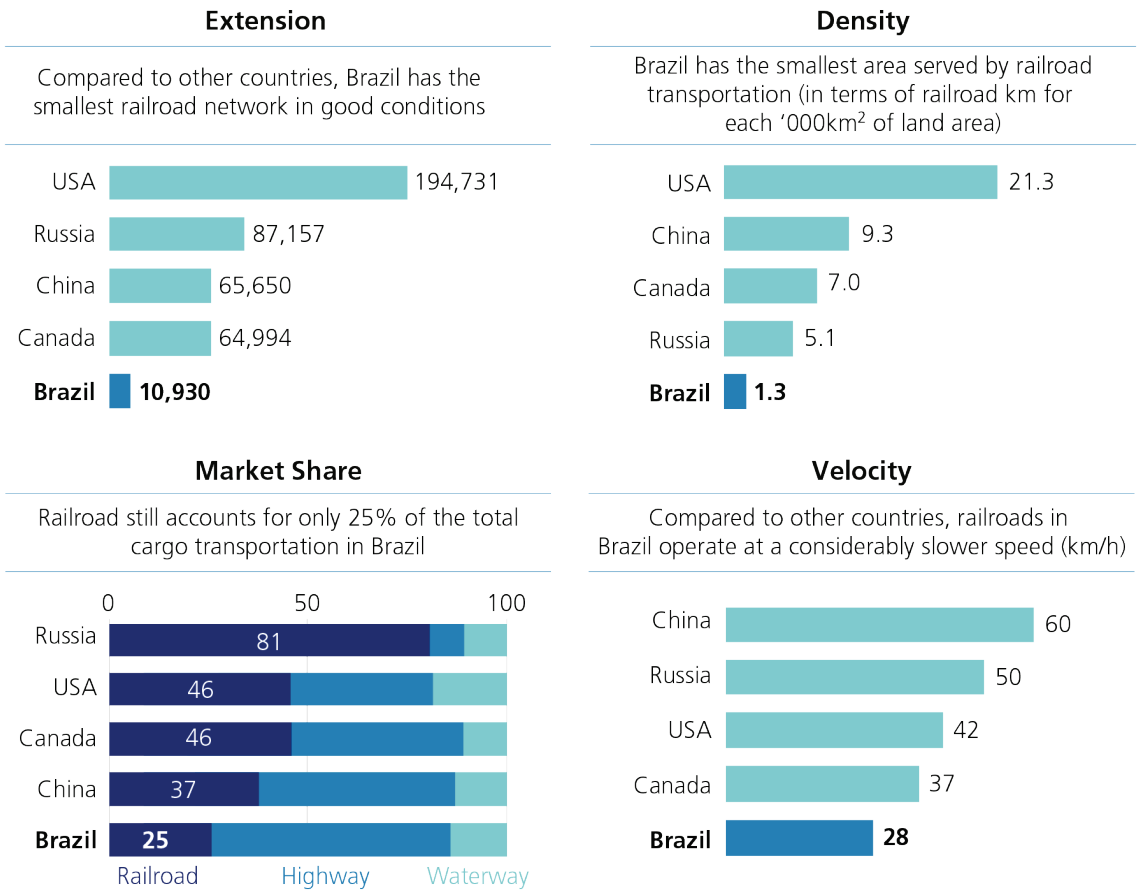
Figure 5: Investment in railroad infrastructure as percentage of GDP

Source: Authors' calculation based on data from the OECD (2017) 'Transport infrastructure investment and maintenance spending, national currency' and World Bank (2017c) 'GDP, current LCU'.

[31] The Index considers the railroad density, the quality of the railroad infrastructure and the efficiency of train services i.e. frequency, punctuality, speed, price.

[32] The 2016 World Bank's Logistics Performance Index (LPI) scorecard uses six key dimensions to benchmark a country's performance and also includes an derived overall score that allows a comparison with the world, the region or income group. The LPI builds on survey asking respondents about their experience in international logistics along a set of questions per dimension.

Figure 6: Railway network scope, density, market share and velocity



Source: Savaris et al. (2013: 56)

Current regulatory approach and reforms

The development of the regulatory approach to the railway sector in Brazil was not dissimilar to other South American countries (OECD, 2013b: 11).[33] A lack of financial resources meant that there was insufficient investment into infrastructures and the publicly-owned rail provider increasingly turned into a burden on public finances (Bosch-Domènech and Montalvo, n.d.: 4; Castelar and Azevedo, 2016). In response, different models of regulatory reform have emerged that also sought, in their own way, to encourage competition. These involve models of vertical and horizontal separation:

- Vertical separation with ownership separation of infrastructure and services and the introduction of an open-access regime: separating tracks and their maintenance, passenger and cargo transportation, and opening up the last two services to competition by selling access to the track network (UK model).
- Vertically integrated market, but with competition around regional concessions that offer regional monopolies to the company/consortia that wins the concession; additionally, existing

[33] See also ANTF's website, 'Cronologia história ferroviária', <http://www.antf.org.br/index.php/informacoes-do-setor/cronologia-historica-ferroviaria>

concessions can be subject to legal unbundling and to rules increasing access rights over time (most common South American model) (Bosch-Domènech and Montalvo, n.d.: 4; Castelar and Azevedo, 2016: 13).

Brazil: vertically integrated railway sector with public procurement of regional concessions

Most South American railway concessions were vertically integrated and, over time, experienced traffic growth, increases in productivity and lower tariffs for costumers (OECD, 2013: 11). As noted, the privatization of the Brazilian railway sector largely took place in the 1990s and involved vertically integrated concessions (including tracks and services) of existing railway and transport services. Concessions were awarded via public procurement processes (Sampaio et al., 2015: 15). A new regulatory framework and concession contracts established rules for concessionaires. ANTT, the National Agency of Terrestrial Transport was established in 2001 to oversee the sector and enforce contracts. Concessionaires were obliged to meet specific output and safety requirements, but had some discretion in terms of addressing these requirements (Castelar and Azevedo, 2016: 12).

The 2012 reform and 'new model'

The National Integration Logistics Program (PIL 1) in 2012 aimed to increase investment in the railway sector and also introduced some changes to the regulatory framework:

- Ownership separation of infrastructure and service provision – grid construction, expansion and maintenance would be separated from transportation services and capacity management;
- private market actors (infrastructure concessionaires) would be responsible for constructing, maintaining, and operating the control centre of new railway infrastructures under concession agreements/PPPs;
- authorized independent railway operators would provide freight services and compete for clients;
- a state-owned company (VALEC) would purchase all transportation capacity from infrastructure concessionaires and resell it in the market through public auctions (Gonçalves and Sampaio, 2012: slide 7);
- existing concessions which were not susceptible to separation would face more stringent rules concerning access rights (Castelar and Azevedo, 2016).

New concessions were to operate under a model that would require full vertical separation and an open access regime. VALEC would buy all transport capacity from the infrastructure concessionaires and resell the right to use rail tracks to transport operators (Castelar and Azevedo, 2016). VALEC would have created a surrogate market for slots in the rail infrastructure and act as an intermediary between infrastructure concessionaires and transport operators (Castelar and Azevedo, 2016). The idea was to eliminate demand risk linked to building new railways, encourage greenfield projects, channel subsidies to investors and lower their risks since financing would have been available at subsidized interest rates from BNDES, and VALEC would have bought up all capacity even when not being able to resell it (Castelar and Azevedo, 2016).

Abandoning of 2012 reform and role of new PPI in addressing reform issues

The 2012 model did not succeed in changing investors' risk perception. It would have imposed high costs on VALEC and the government respectively. It also increased payment risks of VALEC and investors given a lack of legal and asset guarantees (Savaris et al., 2013: 61; Sampaio et al, 2015: 16). While the question of legal certainty and risk mitigation (e.g. via collateral funds/and or down payments to create a revenue cushion for VALEC) were discussed at that time, the new model was subsequently abandoned after the launch of PIL 2 in 2015.

PIL2 returned to the 'old' model of vertical integration between infrastructure concessionaires and operators. However, wider questions of legal uncertainty, political interference and fiscal constraints on the side of government remained. These questions also remained following the creation of the PPI (ANTF, 2011: slide 36).

Regulatory issues

The next section discusses a set of regulatory issues of logistics infrastructures with a particular view of the railway sector in Brazil: ownership and divestiture, new commissioning and greenfield projects, concessions and franchises, as well as operations and management.

Ownership and divestiture

In Brazilian railway sector, there were two main developments concerning ownership and network access. The first development were regional monopolies via concessions involving a relatively small number of companies. The market structure allowed concession holders to price discriminate and offer preferential access treatment (Silveira, 2002).[34] The second development involved railways owned by companies which were mainly commodity producers and traders. Their interest was in establishing linkages to ports in the South-East that facilitated their export and import requirements, but they were not inherently interested in developing third party traffic. These rail lines were privately owned, but could be used for freight transport and also passenger transport.[35] The Brazilian railway sector was therefore mostly vertically integrated and the dominance of particular companies had become more pronounced over time (*Folha de S. Paulo,* 2007). Concession holders' interests were shaped by their underlying economic interests, especially where they were not primarily a logistics company (*Valor Econômico,* 2016a). In addition to that, some of the concessionaires had producers as shareholders (e.g. MRS and after the acquisition ALL/RUMO). These producers ended up with their own rail capacity.[36]

[34] On the corporate structure of concessionaires, see freight rail operators, MRS Logística (2015), <http://ri.mrs.com.br/conteudo_pt.asp?idioma=0&conta=28&tipo=54506>

and Rumo (2017) <http://ri.rumolog.com/ptb/estrutura-societaria>

[35] For example Vale, one of the world's largest mining companies, has exclusive rights over the EFVM (Vitória a Minas) railroad and EFC (Carajás) railroad concessions, acquired control of the FCA (Ferrovia Centro-Atlântica) railroad concession and bought shares in MRS Logística from 2001 onwards (*Folha de S. Paulo,* 2007).

[36] Information from interview conducted on 28 July 2016 (A).

Another problem was the deterioration in the quality of the railway infrastructure. In the past, TCU required that ANTT assessed the network maintenance of those parts of the concession that went unused. The TCU established that approximately 10-11,000km (the total network is 28-29,000km) were in commercial operation. As the quality of the network deteriorated across multiple concessions, the compound effect was that it increased the potential financial burden on government once a concession had come to an end (in addition, a deteriorating part of a network has negative network externalities).[37]

New commissioning ('greenfield sites')

One of the main drivers for privatizing the Brazilian railroad system in the mid-1990s (approx. 25,000 km were transferred to the private sector between 1996–1998) was to attract investment into the deteriorating infrastructure (recovering 'brownfield sites') while reducing demand on the federal budget (Savaris et al., 2013: 56; ANTF 2015: slide 16). Concessionaires became responsible for investing and maintaining the network besides operating the rolling stock. This model did not succeed in generating sufficient investment into new rail capacity. Network expansion was limited and most investment was channelled into rolling stock (Savaris et al., 2013: 56). Concessions were not obliged (by contract) to invest in new lines. Investment into infrastructure targetted the more profitable stretches of the network rather than expanding it. The result was the emergence of bottlenecks in particular access to port zones (Savaris et al., 2013: 56–57). One example was the agricultural commodity corridor connecting Mato Grosso State to the Port of Santos. Here the network was operating above 80%; the situation was even more critical when looking at wider rail access to the Port of Santos. Here some parts of the network leading to the port operated aat a level above 90% (Savaris et al., 2013: 56; ANTT, 2017).

Furthermore, internal rates of return (IRR) and the Weighted Average Cost of Capital (WACC) were not adequately linked to perceived risks (such as future demand risks or payment risks), an issue which was addressed by PIL 2 in 2015.[38] Nevertheless, these factors arguably explained why investors continued to be reluctant to consider network expansion (Gonçalves et al., 2015: 24).

For example, under PIL 1 there was no significant investment made in the railway sector. The goal was to generate investments of R$99.6 billion for the construction and improvement of about 11,000 km of railway lines (Gonçalves et al., 2015: 23). None of these materialized under the programme. This was also due to private investor reluctance (Globo.com, 2015). The lack of any significant network expansion under PIL2 was also linked to old projects previously included under PIL 1 being revisited without any major changes in the incentives for investors (Castelar and Azevedo, 2016: 14). In an attempt to encourage private investment in railways, BNDES offered subsidized interest rates for loans up to 70% of project funding for railway network expansion under PIL 2 (Globo.com, 2015; Portal Brasil, 2015b; Delmon, 2011). Under the new Investment Partnership Programme (PPI), attention was initially focused on three new railway concessions.[39]

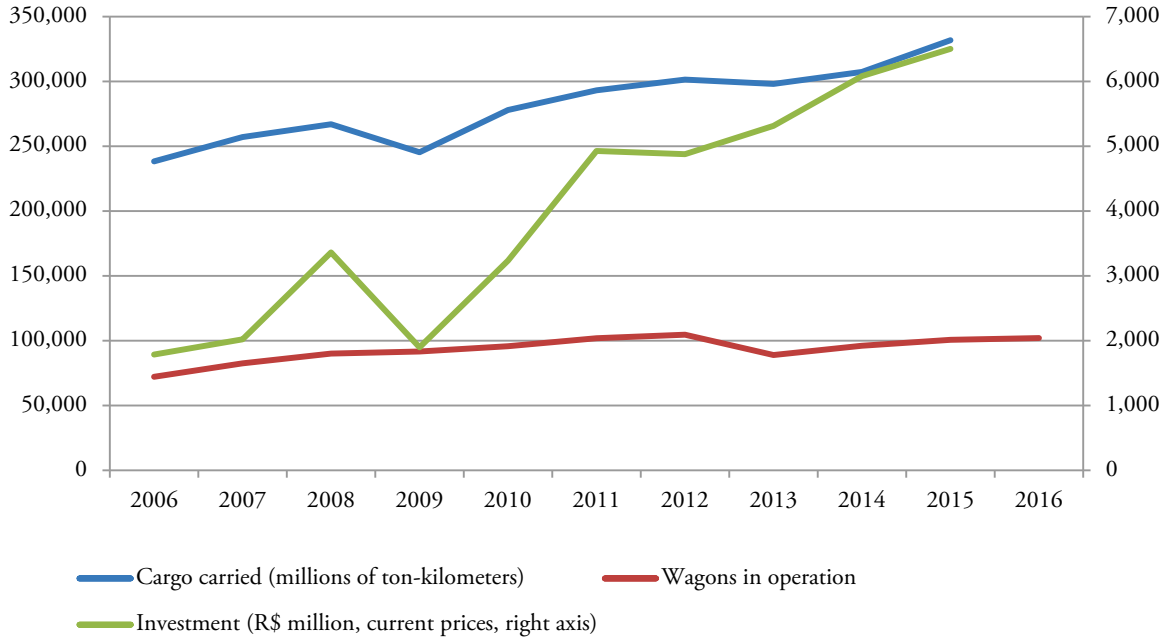
[37] TCU TC 032.268/2013-0 and TC 008.799/2011-3.

[38] Nota Técnica Conjunta n. 19/2013/STN/SEAE/MF and Nota Técnica Conjunta n. 39/2015/STN/SEAE/MF. See also the Brazilian government's website Portal Brasil (2015a).

[39] See Projeto Crescer's website: <http://www.projetocrescer.gov.br/projetos1#>

While levels of overall investments seemed to be increasing since 2009, there appeared to be little connection with the development of overall capacity of the rail network. However, efficiency arguably improved continuously, given increases in freight and stable rolling stock figures (see Figure 7).

Figure 7: Railroad investments and railroad volume over time



Source: ANTT (2016)

Concession and franchise

Concessions and franchises involve the long-term assignment of responsibilities for some investment and service obligations, as well as for operations and management. Vertically integrated concessions including service and infrastructure for private operators have been the dominant model for running the railway sector in Brazil. Concession contracts have also constituted the only significant form of private-sector participation, with some participation also through public procurement in the case of the railway concessions granted to the state-owned company VALEC (Mourougane and Pisu, 2011: 23; *Estadão,* 2016). The wider South American experience suggested that several factors were limiting the emergence of new bidders and investors. Some of them related to the transparency of concession design and procedures, others to the competencies of regulatory agencies, and others to the concessions' exposure to political and institutional risks (Bosch-Domènech and Montalvo, n.d.: 8–10). There were also a number of features that related in particular to Brazil:

- the division of the network into regional subsystems with limited competition between concessionaires which led to regional monopolies on vertically integrated concessions (Savaris et al., 2013: 60);

- the lack of contractual obligations for expanding the network and an incentive structure which led investors to focus more on profitable stretches (Savaris et al., 2013: 60), and discouraged investment in expanding capacity (IFC, 2015: 26);
- the lack of a sectoral regulator (prior 2001), which was said to have reduced the quality of regulation (IFC, 2015: 18).

In addition, access conditions encouraged concession holders that were primarily interested in using the network for their own supply chain (MRS Logística 2015; Rumo Logística, 2017). This, in turn, led to problems of network access of third parties. Concession holders had no incentive to encourage access on the track. They were also said to grant their own cargo preferential access conditions.

The same problems applied to those concessions holders whose business model impacted directly on network usage. For example, Vale, as one of the world's largest iron ore and nickel producers in the world, is one of the largest operators of logistics in Brazil. Its interest in the Brazilian logistics infrastructures (especially rail) was shaped by the changing patterns of global markets for its products. This, in turn, created specific incentives for the utilization of its rail network.[40] The same issue also applied to other concessions, as noted in the Table 10.

[40] Information from interview conducted on 28 July 2016 (A).

Table 10: Main products transported by railway concession, 2016

Concession	Products				
ALLMN	Corn	Soy	Soybean meal	Cellulose	
ALLMO	Cellulose	Iron ore	Steel products	Pig iron	
ALLMP	Sugar	Diesel oil	Gasoline		
ALLMS	Soy	Sugar	Corn	Diesel oil	
EFC	Iron ore	Manganese	Pig iron	Other natural resources	
EFPO	Other cargo	Soy	Corn	Vegetable oil	
EFVM	Iron ore	Mineral coal	Steel products	Coke	
FCA	Soy	Corn	Sugar	Soybean meal	Iron ore
FNS	Soy	Corn	Cellulose	Diesel oil	Iron ore
FTC	Mineral coal	Other cargo	Other cargo		
MRS	Iron ore	Sugar	Cement	Steel products	
FTL SA	Diesel oil	Cement	Gasoline	Steel products	Iron ore

Source: ANTT (2016)

In light of these conditions, regulatory alternatives have been explored. One way would be to introduce vertical separation that decoupled the ownership and management of the infrastructure and the services, together with an open access regime (Bosch-Domènech and Montalvo, n.d.: 7). This solution has been adopted in countries which have railway systems with extensive 'inter-running' across different parts of the network (something that did not exist in Brazil). It is also associated with high transaction costs in terms of dealing with conflicts between infrastructure operator and service providers, especially when it comes to dealing with liability issues. Regulatory attention would have to focus on the price-setting by the infrastructure provider.

Beyond complete vertical separation, other types of 'unbundling' schemes exist:

- accounting separation, i.e. adopting different accounts for different activities within each concessionaire in order to prevent cross-subsidies;
- legal unbundling, i.e. the same legal entity is not allowed to be responsible for different segments of the value chain;
- corporate structural unbundling, i.e. an economic group is not allowed to perform different economic activities in the same sector (Höffler and Kranz, 2011; Sampaio et al., 2015: 15).

None of these options are problem-free. Accounting separation was introduced in Germany and led to continuous concerns about discrimination over access conditions and pricing. More generally, whatever the option taken, it requires considerable regulatory capacity as it entails extensive monitoring of infrastructure providers and the terms of access. Inevitably, regulatory capacity would be required to deal

with gaming by regulatees and judicial disputes due to incomplete contracts, micro-regulation to tackle issues with incomplete contracts (Castelar and Azevedo, 2016: 13).

Operations and management

Since concessions were vertically integrated, the design of concessions included arrangements around operations and management. Issues of velocity, network capacity, and low levels of competence and quality of services have been highlighted already. So-called 'greenfield' projects and network expansion, as well as higher investments in the quality of the network were likely to have an impact on the improvement of service quality (Castelar and Azevedo, 2016: 14; Savaris et al., 2013: 56).

As noted, railway reforms in Brazil had created vertically integrated monopolies in some parts of Brazil (especially over the East-West axis), there was a growing share of inter-running (i.e. providers using other companies' tracks) when it came to the increasing traffic on the North-South axis (Mourougane and Pisu, 2011: 23). Regulated access charges[41] were one way to facilitate further traffic growth (Mourougane and Pisu, 2011: 28).

To enhance operational performance, there was also scope to consider the design of access regimes more broadly.[42] In particular, the existing arrangements were biased towards establishing mutual traffic arrangements instead of setting clear access conditions.[43] As a consequence, access to third party providers was only granted at the discretion of the network provider in view of their perspective on unused network capacity, impact on overall speed on the network and the ability to come to an agreement in the first place. It was argued that codified (and regulated) access conditions would reduce the transaction costs of accessing networks.[44] Regulated access would certainty would not offer a clear solution to the diagnosed problems. One is that network providers have been notorious in policing access to their network and regulatory intensity in monitoring and assessing claims about lack of network capacity was likely to be high. Similarly, regulated access conditions would also require the existence of conflict resolution mechanisms.

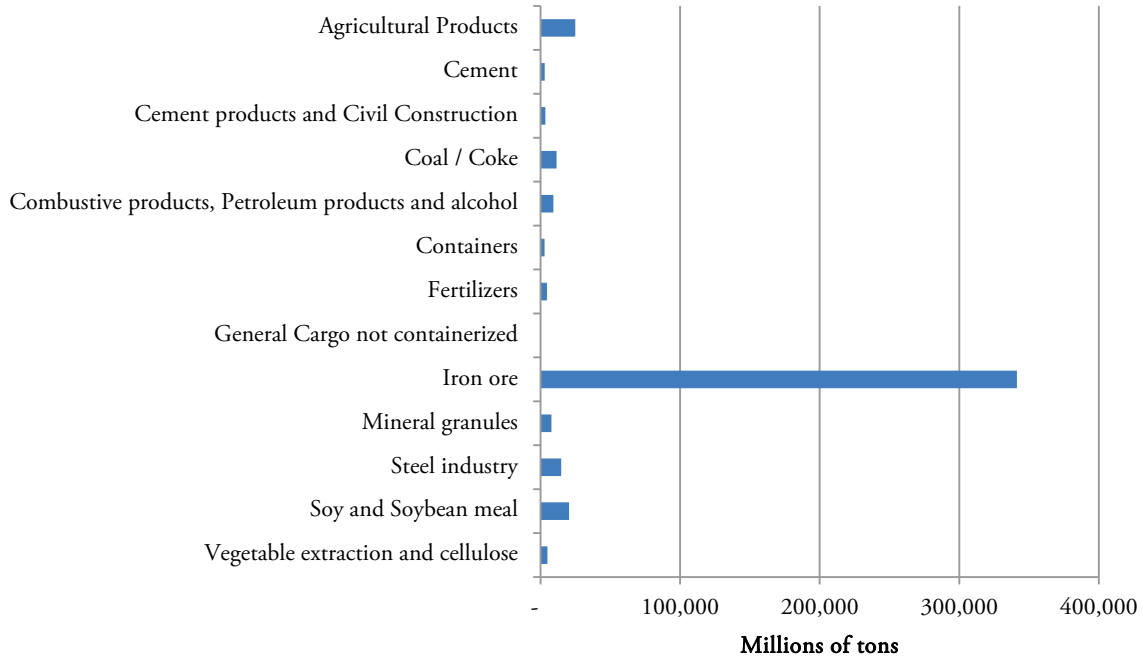
[41] Mourougane and Pisu (2011: 23) note: 'To ensure a minimum degree of interconnectivity, concessionaires are expected to undertake joint transport, whereby the cargo of a railway company is loaded and carried by the concessionaire of the network through which it needs to be transported, upon payment for the transport services. If this is not possible, concessionaires should grant access to their network, upon payment of a fee. In case the parties do not find an agreement the Ministry of Transport could impose compulsory tariffs. This system has, however, failed to produce smooth network interconnections, partly because of physical constraints (tracks' gauge may differ across networks) and insufficient regulation. Setting ex ante compulsory interconnection fees at cost-recovery levels is likely to lower the probability of disputes between concessionaires over connecting rail tracks in different concession areas.'

[42] Information from interviews conducted on 27 July 2016 and 28 July 2016 (A).

[43] Information from interviews conducted on 27 July 2016 and 28 July 2016 (A).

[44] Information from interviews conducted on 27 July 2016 and 28 July 2016(A).

Figure 8: Main products transported through railways, 2013



Source: ANTT (Annual report, 2013)

Table 11: Regulatory issues in the railway sector

Regulatory issue	Specific issue per sector
Ownership and divestiture	• Privatization leads to vertically integrated concessions and oligopolistic market structure with few national champions • Regional monopolies limiting competition and concessionaires using selected network stretches to give 'own' cargo preferential treatment (concessionaires not being logistics provider primarily or serving shareholder interests) • Disuse of stretches can impact quality and becomes issue for government once concession ends
New commissioning ('greenfield sites')	• Privatization focused on recovering 'brownfield sites'; low levels of investment into network expansion by concessionaires over time; selective focus on most profitable stretches • Risk/reward relation for investing into new lines was perceived as too unattractive by investors • Internal rates of return (IRR) and Weighted Average Cost of Capital (WACC) were not adequately linked to perceived risks (such as future demand risks)
Concession and franchises	• Lack of transparency of concession design and procedures • Allowed for anti-competitive conducts by concessionaires in the past • Concessions included limited stimulus for network expansion

	• Given adequate regulatory capacity vertical separation / unbundling schemes could help foster competition and network expansion
Operations and management	• Limited interconnection/integration, different gauge sizes, frequent urban crossings, high sinuosity and low velocity due to overstretched network capacity affect operation quality • Low levels of quality of service across system according to World Bank LPI • Capacity issues at crucial stretches and junctures (e.g. access to ports) due to low levels of new 'greenfield' commissioning

Regulatory challenges

Commitment challenge

With regard to the commitment challenge, the main issue involved the nature of the concession and the possibilities for triggering renegotiations (Mourougane and Pisu, 2011: 23). Regulatory regimes for concessions include the contract itself and the commitment of the regulator to that contract (Moore et al., 2014: 218). One can also distinguish between very high powered contracts (e.g. price cap) and much lower-powered contracts (e.g. rate of return), with the regulatory regime becoming less high-powered when the concessionaire can force a renegotiation if it faces financial difficulties (Moore et al., 2014: 218–19).

As elsewhere, there was a high rate of concession renegotiation across Latin American infrastructure projects. The average interval between the initial granting of the concession and the first renegotiation was about two years. This meant that regulatory regimes developed into hybrids of price cap and rate of return regulation (Moore et al., 2014: 218–19). Analysing 124 transport concessions in Brazil, Chile, Colombia and Peru between 1992–2011 with a total of 399 renegotiations, Moore et al. (2014: 217) found that almost half of the cases for renegotiation were initiated to alter the project's investment plan or schedule, to compensate concessionaires for exogenous changes in demand or costs, or to compensate for previous governments' actions 'in the public interest'. The most common renegotiation outcome were changes to the investment plan or schedule with concessionaires increasing the volume of investment in exchange for a direct payment from the regulator, an increase in tariffs or an extension of the contract (Moore et al., 2014: 218).

In the case of Brazilian railway concessions, tariff reviews involved a hybrid model between price cap and rate of return (Sirtaine et al., 2005: 37). There were periodic reviews to adjust the tariffs to indexes that were supposed to simulate cost evolution (price caps), but there were also extraordinary reviews to adjust to events for which regulators were formally carrying the risk, and contracts also allowed tariffs to change whenever there was alterations in the investment programme i.e. rate of return (Moore et al., 2014: 219). The lack of adjustments to the 'factor X' and the lack of clear rules of investment and quality goals led to departures from methodologies that were associated with price cap regulation Camacho, 2014: 143). Overall, regulatory mechanisms were open to capture, especially by concession holders that faced falling demand for their services (Moore et al., 2014: 219). It was argued that rail regulation in Brazil was

therefore 'low-powered' in that the 'deck' was stacked in favour of concession holders' needs for flexibility at the expense of long-term credibility and commitment.

Towards the end of PIL 2, some government bodies sought to use contract renegotiations (early contract renewal for existing concessions) as well as financial incentives (IRR for future concessions) to increase investments in railway network expansion. Such renegotiations occurred both under PIL2 and under the Provisional Measure 752 (*Valor Econômico*, 2016e, 2016f). Furthermore, a new WACC reference point for future railway concessions was established when it was raised from 8.5% to 10.6% (Gonçalves et al., 2015). In all these cases, the renegotiation involved an exchange of contract extension for further investment and enhanced performance monitoring (Gonçalves et al., 2015). However, this approach was not without its critics. While some emphasized the improvement of the contractual arrangements, others questioned the lack of competition and the credibility of these renegotiations. It was also suggested that the experience of PIL 1 and PIL 2 indicated that it was unlikely that these measures would encourage investment into network expansion.

Control challenge

As noted in the main report, regulatory governance in Brazil has specific institutional shortcomings with high levels of fragmentation, blurred competencies and weak institutional leadership, as well as high juridification (Cunha and Rodrigo, 2012), which also affects the ability of relevant government bodies to effectively monitor the railway concessions and the use of the asset bases. ANTT as the main regulator in the sector was seen as moderately effective in monitoring the sector, especially after 2012 reforms sought to introduce regulatory tools for inspections, and reinforced mediation powers between market actors on the side of regulators Savaris et al., 2013: 62).

The main problem, however, related to the design of the initial concession contracts. As noted, concessions were able to abandon parts of the network.[45] Even where enforcement action was introduced, measures were delayed, if not nullified by judicial review proceedings. For example, the ALL-Rumo concession was required to restore parts of its network that it had initially abandoned. However, there was never any action due to frequent appeals. [46]

While there were extensive controls over the design of concession contracts, involving also external watchdogs, such as the TCU, these actors could only assess the formal compliance and review clauses. There was limited legal competence to launch formal reviews in the absence of contractual obligations in the concessions.

Questions of oversight and control also involved wider competition issues. Before merging with Rumo, for example, ALL was one of the very few logistics operators in Brazil that did not have a major network user among its shareholders. The merger was not opposed by ANTT (the sectoral regulator) and by CADE (the competition authority), although the latter did introduce some obligations. Nevertheless, the case highlighted the need for further cooperation between ANTT and CADE as it involved not just the

[45] Information from interview conducted on 2 December 2016.

[46] For example, the judicial proceedings 00023238-74.2003.4.03.5101, 0000391-48.2007.4.04.7117, 5001291-04.2011.4.04.7117.

logistics infrastructure sector, but also affected other economic sectors, both upstream and downstream in the production chain.[47]

Uncertainty challenge

Economic development projections and political risks, as well as fiscal situations affect public commitments to logistics infrastructure projects in the short, medium and long-run. At the time of writing, the political uncertainty and the troubled economic landscape meant that investment in logistics infrastructures were affected by considerable uncertainty. The potential lack of adequate financial instruments, such as guarantees, insurances and other credit enhancement schemes might place barriers for new investors entering a market since these instruments are crucial to further mitigate risks (World Economic Forum 2016c: 8). There were also questions about the identity of potential bidders, regardless of projection of future demand for freight and passenger rail traffic. There were also queries about the possibility of encouraging further network effects by fortifying network integration (Bosch-Domènech and Montalvo, n.d.: 9).

Regardless of the wider political and economic context, there was also considerable legal uncertainty. For example, land expropriation continued to be highly controversial and politically salient. In the case of Transnordestina Railway legal proceedings to expropriate land contributed to a project delay of more than ten years (Governo do Estado do Piauí, 2016). The discovery of archaeological sites or endangered species required considerable delays in project development, although such challenges should be accounted for in initial project design.

Table 12 summarizes the regulatory challenges in the Brazilian rail sector.

[47] Information from interview conducted on 28 July 2016 (A).

Table 12: Regulatory challenges in the railway sector

Regulatory challenge	Specific issue per sector
Commitment challenge	• Short timeframes between awarding concession and renegotiations; tariff reviews can be abused by concessionaires to change contract conditions when facing demand reductions or financial distress • Financial incentives and low-powered regulation (e.g. use of *ex ante* IRR) can increase leverage of concessionaires (demand for adjustment favoured over contractual rigidity) • Overall unfavourable economic development, political instability and fiscal situation undermine state's ability to invest as well as commitment to contractual obligation (e.g. new concessions and early renewal of concessions used as opportunity to increase investment in network but lack of confidence and uptake on the side of market players)
Control challenge	• Fragmentation of regulatory governance undermines ability of government bodies to monitor indicators around concessions effectively; also affects ability to assess market structure and decisions on mergers affecting other economic sectors as well • Design flaws in railway concession contracts allowed for lack of investment and maintenance/usage of the network on the side of concessionaires
Uncertainty challenge	• Current economic development and related political risks, as well as fiscal situation (rising fiscal deficit), can affect public commitments to logistics infrastructure projects and therefore investor outlook as well • Socio-economic change and changes in the global economy can affect demand for freight (as well as passenger transport) services and drive the need for concession contract adjustments • Pre-existing physical attributes of the asset base can introduce additional uncertainties around demand and financial viability of projects and concessions

10. Appendix C – Regulatory issues and challenges in the road sector

Short overview of the road sector

The road sector in numbers as of 2015 (CNT, 2015b):

- Total road network: 1,720,607 km
- Paved roads: 213,299 km (12.4%)
    - Federal roads: 66,712 km (31.3%)
    - State roads: 119,691 km (56.1%)
    - Municipal roads: 26,826 km (12.6%)
- Unpaved roads: 1,353,186 km (78.6%)
- Planned roads: 154,192 km (9.0%)

While Brazil had one of the largest road networks in the world in absolute terms, the development of the logistics sector was impeded by the poor quality of the road network. Brazil lagged behind relatively (in terms of road km/1000 sq km) when compared to other countries such as the US (438.1), China (359.9), Russia (54.3), Canada (41.6) and Australia (46.0). Brazil achieved more or less the same rate as Argentina (25.0) (CNT 2016a: 14). Cargo transport relied heavily on highways. There was an overall lack of investment in expanding the road network and in creating an integrated road network. As a result, the existing network suffered from overuse and high traffic density in some parts of the road network.

Between 1945 and 1988, the federal government prioritized the development of the road sector in Brazil. Rapid expansion of Brazil's highway network occurred between the 1950s and 1970s following the creation of the National Highway Fund (Fundo Rodoviário Nacional, FRN) in 1945. This fund was closed in the early 1980s (Savaris et al., 2013: 26). During the mandate of President Juscelino Kubitschek (1956–1961), highway investments were prioritized and linked to the development of a national automotive industry (Savaris et al., 2013: 26). The share of road in overall freight transport increased from 38% in 1950 to around 60% in 1960. This share remained constant over the following decades. Highway investment increased heavily during the 1960s and 1970s when the network of federal paved highways increased from 8,700 km to 47,500 km by 1980 (Savaris et al., 2013: 25); the size of the network of federal paved roads was at 66,410 km at the time of writing (ABCR, 2015). In the early 1990s a process of privatization was initiated by the federal government, which relied on granting concessions.

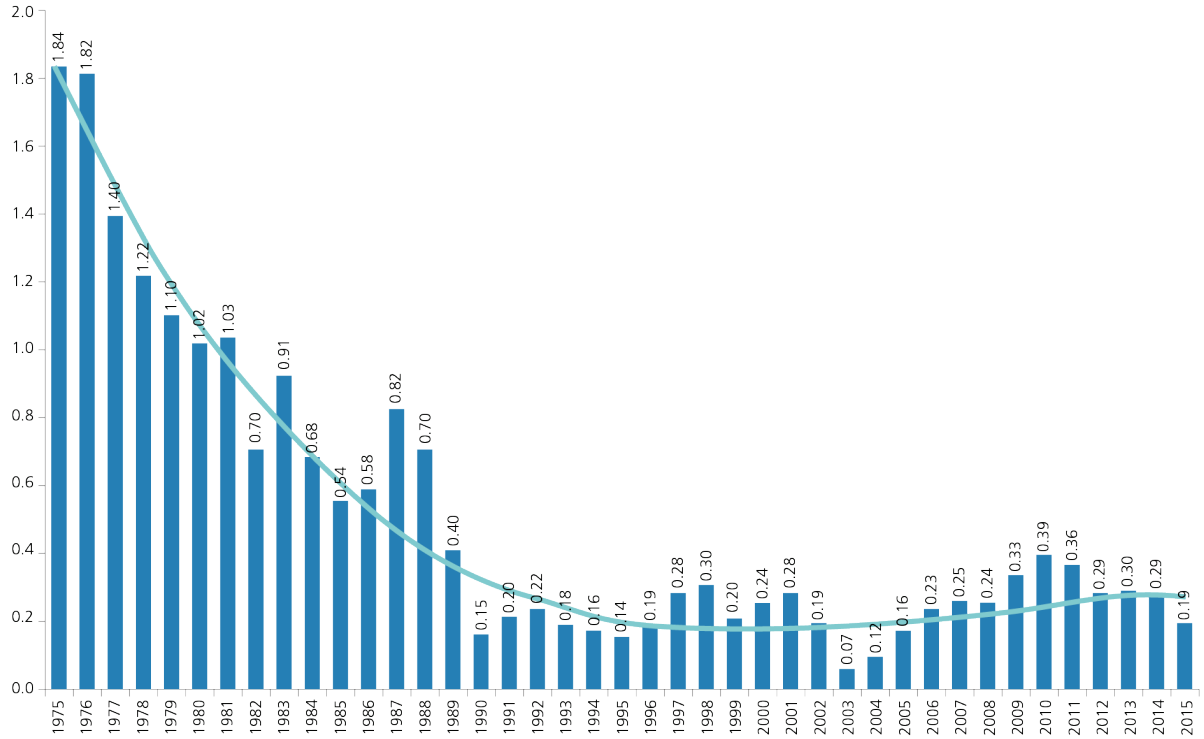
Up to the late 1970s, annual investment in the highway infrastructure was consistently above 1% of GDP (an average of 1.6% of GDP between 1967 and 1976). Investments fell to less than 0.5% of GDP between 1980 and 1996 (IFC, 2015: 16). Over the past two decades, levels of spending on highway

expansion and maintenance did not recover either (see Graph 2). Levels of spending on highway maintenance for example were less than 1% of GDP per year. Approximately 6% of GDP would have been necessary in order to bring highway standards closer to those of more advanced economies (Amann et al., 2014: 14). Further problems emerged from the accumulation of payments due in the last few fiscal years. This meant that over 80 per cent of the 2016 road budget was already committed to obligations and late payments (CNT, 2016a: 349).

According to a 2015 report of the Brazilian National Transport Confederation (CNT), only around 13.6% of the total constructed roads (excluding planned roads) were paved. There was also an uneven network development –the South and South-East were relatively well served with paved and multi-lane roads. In contrast, the North, the North-East and the Centre-West were underdeveloped (Amann et al., 2014: 14).[48] Network expansion did not follow growth in traffic, especially in the North, North-East and Centre-West, where the number of vehicles increased 193.5%, 181.4% and 129.6% respectively between 2006 and 2016 (CNT, 2016: 16). This represented a major issue for freight transportation (CNT 2015b). Highway usage accounted for 58% of total Revenue Tonne-Kilometres (RTKs), railroads for 25% and waterways for 17% (Savaris et al., 2013: 16). In addition to this, passenger transportation (95% in 2010) was mainly undertaken by roads (World Bank, 2010). This concentration on roads was said to be unbalanced. Brazil was said to have a high ratio of low value-added cargo due to its steep amount of commodity extraction and production (in particular minerals and agricultural products). This made cost dilution more important as the final freight rate was largely driven by distance and volume (Savaris et al., 2013: 16). A shift from road to a more effective rail sector would possibly reduce freight costs significantly.

[48] The South and the South-East also have the largest proportion of roads considered in 'great' or 'good' conditions, while the North have the largest proportion of roads in 'regular', 'bad' or 'terrible' conditions, followed by the Centre-West and the North-East (CNT, 2016a: 332).

Figure 9: Evolution of federal investment in roads over time, Brazil, 1975–2015, Investment/GDP (%)



Source: CNT (2016a) with data from Siga Brasil

Regulatory approach for the road sector

Regulation and development of the road sector in Brazil began within the State of São Paulo and the federal government at broadly the same time, following the creation of the State Road Department (DER-SP, Departamento de Estradas e Rodagens) in 1934 and the National Road Department (DNER, Departamento Nacional de Estradas e Rodagem) in 1937. However, it was only after the Decree-Law 8463/45 that granted budgetary autonomy to the national department and created the National Road Fund that federal roads would expand from 423 km to 968 km in the subsequent five years.[49] The first federal toll roads in Brazil were not under private concession, but were managed by DNER, the National Department of Roads (*Revista ANTT*, 2010). Funds for road development from the federal government decreased over time (see Graph 2 above) and the sector underwent a larger privatization programme in the Federal Toll Road Concession Programme launched in 1993 (Savaris et al., 2013: 25). The first round of five concessions auctioned by the federal government between 1994 and 1997 used the lowest toll fee as the main auction criterion (Savaris et al., 2013: 25). Using the same criterion, the second round of concessions was launched between 2007 and 2009, initially including mandatory works, such as the duplication of road lanes, and indicators and a schedule defined by the regulator ANTT (phase 1). These

[49] See DNIT's webpage: 'Histórico do Rodoviarismo', <http://www1.dnit.gov.br/historico/>

requirements were diluted later by linking network capacity expansion to increases in traffic (phase 2).[50] The third round of concessions was launched between 2013 and 2014.[51]

ANTT was created in 2001 after the first round of federal concessions, but it was not until 2005 that ANTT would also conduct feasibility studies[52] for roads concessions which previously had been undertaken by the Ministry of Transport (*Revista ANTT,* 2010).

States launched their own concession programmes shortly after Law 9277/1996 allowed for the delegation of responsibilities for stretches of federal roads to the states (*Revista ANTT,* 2010). Difficulties in managing these contracts led to a policy reversal in 2000. Accordingly, all toll roads that ran into operational and financial difficulties were returned under the oversight of the federal government.[53] At the time of writing, 11,191 km of toll roads were auctioned as private concessions by the Ministry of Transportation, ANTT or states under the delegation regime; 9,969 km were managed by ANTT.[54]

With the introduction of the franchise/concession model, public bodies (mainly ANTT) were mostly limited to technical regulation, for example inspections of quality and activities of the operators, monitoring of the level of investments, as well as reviewing annual toll rate adjustments (IFC, 2015: 16). While the concession model appeared to point to some success in terms of network expansion, wider issues around quality and capacity in crucial bottlenecks remained unsolved.

Underinvestment, traffic growth and road deterioration represented particular problems for public roads. Private roads were in a significantly better condition (see also Figure 10 below; IFC, 2015: 16). However, overall performance in the road sector was still very low as the World Economic Forum ranked Brazil on place 111 out of 128 countries in road quality.[55]

Given that levels of public investment remained low, was is also questionable whether future network expansion could be based on the existing concession model (IFC, 2015: 17). Extending the concession model to further parts of the network was likely to be problematic as economic interests were possibily limited given low traffic density. As a result, it was questionable whether road tolls were viable (IFC, 2015: 17). Nevertheless, opportunities for privatizing larger parts of the network did exist. For example 10,000 km under the management of the National Department of Transport Infrastructure (DNIT) were identified for potential concessions. The Planning and Logistic Company (EPL) mapped 35,000 km of roads which could attract private investment (*Valor Econômico,* 2015).

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[50] See Federal Government of Brazil's website: 'Regulação da Concessão de Rodovias Federais', <http://cbrcbrasvias.com.br/palestras/arquivos/Pal%2003%20-%20Mario%20Mondolfo.pdf>

[51] See ANTT webpage: <http://3etapaconcessoes.antt.gov.br/>

[52] See ANTT website: 'Estudos de Viabilidade', <http://www.antt.gov.br/index.php/content/view/13203/Estudos_de_Viabilidade.html>

[53] See ANTT website: 'Histórico', <http://www.antt.gov.br/index.php/content/view/4978/Historico.html> A similar order of things recurred a couple of years later with the public roadways, when the Provisional Measure 82/2002 allowed for the decentralization of 14,506.2 km of federal roads to several states. When the states could not provide for the right maintenance to the roads, due to their interposition with other federal stretches and budgetary issues at the state level, the federal government resumed responsibility for more than 10,000 km of these roads in 2015 (CNT, 2016a: 11–12).

[54] See ANTT website: 'Histórico', <http://www.antt.gov.br/index.php/content/view/4978/Historico.html>

[55] WEF (2016a, 127). The rank assessed straightness, speed, extensiveness and efficiency of roads.

Under the PPI, the immediate attention focused on the concession of two existing roads (BR-101/RS and BR-364/365), which were supposed to be auctioned as toll concessions using the lowest toll as the main auction criterion.[56] New investment opportunities also existed among the existing set of concessions. However, one major obstacle to using PPPs for network expansion was the current fiscal crisis and past experience with payments of concessionaires via DNIT. At the beginning of its financial year the department received only parts of the budget required to cover financial obligations in the budgetary year (a pattern that affected the whole Brazilian executive). Furthermore, payments were often delayed and depended on additional budget transfers from the Ministry of Planning (*Valor Econômico,* 2016g).

Regulatory issues in the road sector

The main issues that required regulatory attention involved the poor condition of the overall road network and increasing levels of maintenance investments (which affected mainly public roads), as well as network expansion, especially around key bottlenecks due to the lack of public investments and private financing schemes (IFC, 2015: 17, 25; Amann et al., 2014: 23).

Ownership and divestiture

Road privatization in Brazil was based around the concession model. Federal privatization auctions defined a minimum set of investments including rehabilitation and network expansion, and concessions were given to the bidder that offered to charge the lowest toll tariffs (IFC, 2015: 16). Individual Brazilian states (whose attempts at privatizing their roads were nine times greater than those by the federal government) applied a similar model but with some states auctioning to the bidder that offered the highest award value such as in the first round of road concessions in São Paulo (IFC, 2015: 16).

Challenges arose when roads crossed different federal levels, or when states adopted policies that affected private investment. Some of the first state concessions (especially Paraná and Rio Grande do Sul) had problems following attempts from state governments to unilaterally reduce toll tariffs without due compensation for private concessionaires. In the case of Rio Grande do Sul, one state road was placed under the management of the federal government in 2000 after recurrent contractual infringements by the state government (World Bank, 2010). Eventually the Federal Court of Justice (TRF4) granted the concessionaires compensation. Additionally, in 2000, in light of the concerns with concession management at state level the National Council of Divestiture (CND, Conselho Nacional de Desestatização) also recommended that the policy of delegating roads to the state level should be reversed and that responsibilities for toll roads should be returned to the federal level.[57]

New commissioning ('greenfield sites')

Contract amendments and targets for network expansions in existing concessions were used to extract additional value from the concession (Savaris et al., 2013: 37). Until 2008, incremental investments in current concessions were approved by the regulator using the initial rates of return from the original contracts (Savaris et al., 2013: 37). Subsequently, TCU requested that ANTT developed a formula to

[56] See Projeto Crescer website: <http://www.projetocrescer.gov.br/projetos1#>

[57] See ANTT website: 'Histórico', <http://www.antt.gov.br/index.php/content/view/4978/Historico.html>

calculate the marginal return on further investments by using additional Capex based on the current cost of capital; ANTT set out a new marginal IRR methodology (Resolution 4075) in 2013. This resolution established a new set of parameters and rules in order to support negotiation process (Savaris et al., 2013: 37). However, it remained to be seen whether these new provisions would translate into actual network expansion.

The concession model allowed for some incremental investments in expansion as well as increases in the capacity of private toll roads. This was somewhat unsurprising, given the fact that mainly highways with high traffic density were affected. However, there were some barriers for using concession models for any major network expansion. In the past, private toll roads with very low tariffs were regulated under performance standards and lacked precise contractual investment targets for increasing capacity of existing roads or expanding the network (Mourougane and Pisu, 2011: 24); in other cases, the obligations were deemed as too strict and concessionaires sought contractual amendments. In general, most parts of the fare revenues (60% to 80%) were allocated to ordinary operational costs such as administration of tolls and roads, capital return and taxes, and only a smaller part (20% to 40%) was alloted to road works, and mainly for maintenance (World Bank, 2010). While there was scope for improving targets for capacity expansion in existing concessions (and their enforcement), the creation of financing arrangements for a wider network expansion remained a much bigger and unresolved issue. Construction costs were likely to have a considerable effect on toll levels, triggering political and public opposition (IFC, 2015, p. 17).

Suitable (long-term) highway financing schemes had also not been developed for those parts of the network which were operated by the private sector – despite steady cash flows and captive demand. Even those concessionaires that have managed to tap into private financing for their investments seemed to rely on short-term financial instruments (IFC, 2015: 17).

Concession and franchises

Concession award criteria in auctions strongly influenced the profile of competition for obtaining road concessions (World Bank, 2010: 29). For example, in the case of those road concessions that were auctioned as part of PAC 1 at the beginning of 2007, regulation allowed for the use of different auction criteria: (i) the lowest toll, (ii) the highest award value, (iii) the best technical proposal, or (iv) a combination of these criteria; the practice at the federal level was to focus mainly on the first criterion (World Bank, 2010: 29).

International experience has shown that using the lowest toll as the main auction criteria encourages 'low balling' leaving the final contract holder in a poor financial position if subsequent toll revenues are too low; research based on data from concessions in Latin America and the Caribbean found that renegotiations are significantly more likely when the main auction criterion is based on the lowest tariff (60%) compared to when it is the highest value payed for the concession (11%) (Guasch, 2004). If costs of re-tendering contracts outweigh the costs of re-negotiating contracts, the concessionaire was likely to seek higher tolls in order to make up for losses (World Bank, 2010: 29. This problem was likely to increase over time, as extremely low offers were needed to win a contract; with discounts on the auction price forecast by the government to rise as high as 65,4% (World Bank, 2010; Mattos, 2013: 65). Such a

pattern was likely to cause adverse selection of the concessionaires with the best expectations of a future contract adjustment, instead of the most efficient or most capable to provide low tariffs (Mattos, 2013). The Federal Court of Accounts (TCU) recognized these issues and tried to intervene, however concession audits were generally unable to prevent low-balling and lengthened the concessions process (Moraes, 2010: 18).

The four different types of highway concessions presented in Table 13 below were put forward in earlier discussions on how to define auction criteria, contracts and the balance of risks between public and private actors (in particular demand risks). While these are just examples reflecting earlier discussions around the regulation of concessions, these types can be used to illustrate different approaches of how to design a concession discussed in the Brazilian context. Under a more common concession contract, the financing is provided exclusively through road tolls, as opposed to 'administrative concessions' where the financing would be provided through a 'shadow toll' and the government pays the private partner according to the existing traffic volume. The first two roadway concessions issued recently under PPI tend to be more common concession ('pure concessions') using lowest toll as the main auction criterion in the case of one concession.[58]

Table 13: Four suggested types of highway concessions

Pure concession *Concessão pura*	**Sponsored concession** *Concessão patrocinada*
• Financing through road toll • All routes will be charged for • Fee calculation ensures financial return on each route	• Financing through road toll and public payment • Fees on lucrative routes • Non-lucrative routes also receive public payments
Self-sustainable pure concession *Concessão pura autossustentável*	**Administrative concession** *Concessão administrativa*
• Financing through a toll on each route • Providers on lucrative routes pay a fee to a clearing house which redistributes these to non-lucrative routes	• Maintenance financing comes exclusively through public payments • Payments vary according to traffic flow ('shadow toll')

Source: Valor Econômico (2015)

Mott MacDonald in work for the World Bank, evaluated a proposal for the BR-476 highway concession, a PPP project which entailed rehabilitation and capacity expansion of the existing roads, as well as operation and maintenance to be paid for via direct tolling of the road users through the concessionaire (World Bank Group, 2016: ii). While the review was focused on this one project only, the issues identified in that study were representative of the wider road infrastructure sector around auction and contract design for planned PPPs. The study identified two categories of issues (category 1 and 2 issues).

[58] See Projeto Crescer's website: <http://www.projetocrescer.gov.br/projects>

The former potentially affected the 'bankability' of the project and the latter potentially deterred international investors from bidding for the concession. Issues affecting bankability related to a short procurement timetable that affected the level of technical and financial due diligence required. There were also wider transparency issues. Transparency-associated improvements related, according to the study, to five areas:

- a clear evaluation methodology for the bid review process based on principles of the Most Economically Advantageous Tender (MEAT);
- showing the exact method of calculating the X Factor including rules for its application;
- releasing any studies and surveys undertaken on behalf of the procuring authority PMI (Procedimento de Manifestação de Interesse) process on a non-reliance basis or even requesting collateral warranties from the party preparing the PMI to be novated to the future concessionaire; strategic pipeline planning via a government PPP unit;
- addressing issues around expropriation and resettlement costs (World Bank Group, 2016: iv).

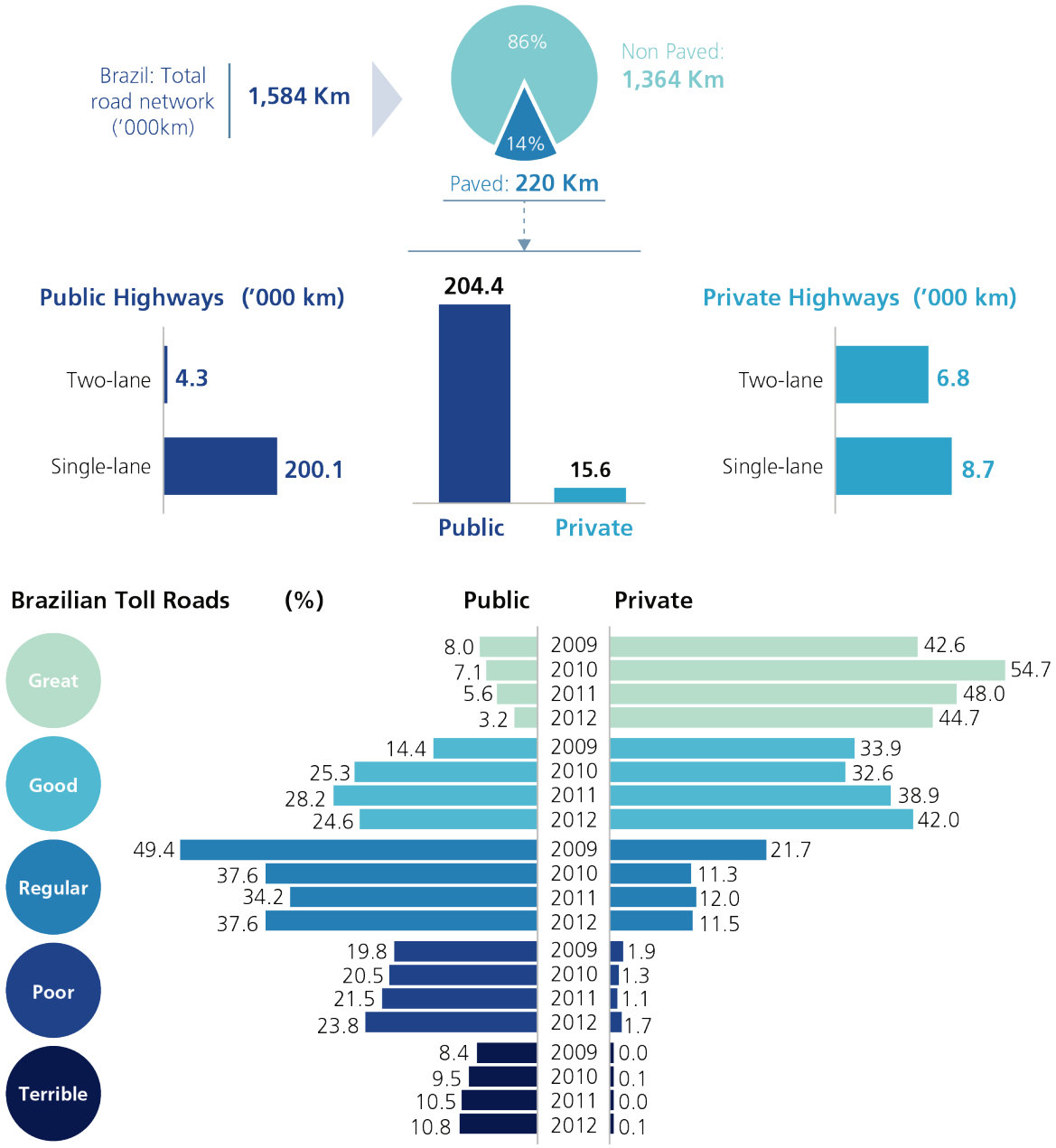
Several factors were regarded as impediments on international investor outlook and willingness to bid: high financial commitments before financial close; lack of documents setting out change management and how compensation would be obtained if change occurs; lack of clear termination clauses setting out how the agreement will be ended for example in the case of default or a prolonged *force majeure* event; lack of clear completion provisions including risk mitigation for lack of independent sign off; a need to enhance payment mechanisms with measures that can help mitigating risks related to the revenue being assumed by the concessionaire; an unclear link between PMI, Highway Exploration Programme (PER, Programa de Exploração da Rodovia) and concession agreement (World Bank Group, 2016: vii–x).

Operations and management

When evaluating at the quality of private toll roads, the concession model appeared to be successful in terms of supporting the improvement and maintenance of road conditions (IFC, 2015: 16). However the conditions for public toll roads and highways were significantly worse and indicated a lack of investment in maintenance. As noted, only 14% of the Brazilian road network was paved (about 220,000 km total) and out of that 204,400 were public highways (and toll roads managed by public companies).[59] Only 15,600 km were private highways which was just a small share of the paved road network. The largest part of the road network was single-lane (about 200,000 km of public highways) and over a quarter of the public toll roads were in poor or terrible conditions (23.8% poor, 10.8% terrible; 34.6% total in 2012). Nevertheless, the application of the concession model had a significant positive impact on road maintenance and investment, with only 1.8% of private toll roads being in poor or terrible conditions (in 2012). This was a considerable contrast when compared with the situation of public toll roads. It reflected a wider issue of underinvestment in road maintenance of roads in particular in relation to those public parts of the network.

[59] For example, state toll roads managed by EGR, a company owned by the state of Rio Grande do Sul; <http://www.egr.rs.gov.br/conteudo/2068/egr-responde>

Figure 10: Overview of the Brazilian highway network



Source: Savaris et al. (2013: 32)

More recent numbers on road conditions from the Brazilian National Transport Confederation (CNT, 2016a: 88, 101; ABCR, 2015) show the size of the total road network as 1,720,756 km with a smaller share of the paved road network being surveyed with regard to road quality (211,468 km of paved roads). Approximately 83,223 km were public highways (of which 4,512km were two-lane and 78,711 km single-lane roads) and about 20,036 km were private highways (9,285 km of two-lane roads and 10,751 km single-lane roads). Among the public toll roads, 5.0% were assessed as being in great, 27.9% in good, 38.2% in regular, 21.1% in poor and 7.8% in terrible conditions.

Among the private toll roads, the conditions were: 39.0% great, 39.7% good, 19.9% regular, 1.3% poor and 0.1% terrible. The CNT data from 2016 showed a similar picture in terms of road conditions, with a slightly higher proportion of public toll roads being in good or regular conditions as compared to the data from 2012 (Figure 10). The maintenance of public roadways under DNIT responsibility was organized under the Roadway Maintenance National Plan (PNMR) and facilitated mainly through Roadway Maintenance and Rehabilitation Contracts (CREMA) which ran for up to five years. Another main type of contractual arrangement for road maintenance was the so-called Annual Plan of Work and Budget (PATO) under which private companies acquired stocks of material to be used for maintenance work throughout the year. However, given that only a small part of the network was paved, most roads were single-lane and a significant part of the public toll road network was in a poor condition, with issues surrounding road quality and maintenance remained highly salient.

Table 14: Regulatory issues in the road sector

Regulatory issue	Specific issue per sector
Ownership and divestiture	• Sector privatization based around concession model developed altogether in some states and at the federal level • Federal concessions were initially given to the bidder that offered lowest toll rates which might have encouraged gaming/low-balling and renegotiations; state concessions initially used the criteria of the highest award value but changed back to the federal model later on • Individual states privatized their road network nine times more than the federal government • Past cases of states making unilateral decisions on toll rates without compensation impeding on private investments; this resulted in transferring responsibilities for roads back to federal government
New commissioning ('greenfield sites')	• Lack of clear investment targets for network expansion in past concessions; renegotiations used to soften contractual obligations • Wider barriers for using concession model for any major network expansion remain given that only small set of road network is actually privately operated under concession • Concessionaires would probably have to levy higher tolls for network expansion which could trigger public opposition • Insufficient development of long-term financing schemes for new investments by private sector • Lack of public resources to increase investment into network expansion
Concession and franchises	• Concession award criteria in auctions can strongly influence the profile of competition for obtaining road concessions (e.g. focus on lowest toll offered might have encouraged gaming/low-balling) • Wider issues in preparation of auction process and concession agreement affecting bankability (e.g. short procurement timetable, transparency issues) and investor outlook (e.g. high financial

	commitments before financial close; lack of documents setting out change management/compensation; lack of clear termination clauses and completion provisions; mitigation of risks related to concessionaire's revenue; unclear link between PMI, PER and concession agreement)
Operations and management	• Concession model seems to be successful in fostering some improvement and maintenance of road conditions • Conditions for public roads are significantly worse and indicate wider issue of underinvestment in maintenance • Given that only a small part of the network is paved, issues around road quality and maintenance will be hard to tackle across the wider network despite potential successes via concessions

Regulatory challenges in the road sector

Commitment challenge

Expropriation and resettlement were core issues that contributed to cost overruns on Capex and Opex (World Bank Group, 2016: iv). In order to tackle this issue concessions contracts included precise adjustment factors to increase prices in line with inflation above a certain threshold (World Bank Group, 2016: iv). Concession contracts nevertheless suffered from a lack of clarity around termination clauses, especially in relation to default or a prolonged force majeure event. It therefore also lacked provisions dealing with potential compensation (World Bank Group, 2016: vii–viii). This also included a lack of provisions to deal with change management. This led to prolonged disputes and contract renegotiations (World Bank Group, 2016: vi). ANTT also had the option to terminate concession contracts in the case of poor performance. Thresholds and criteria needed to be clarified as part of the concession agreement so that potential bidders and investors developed a shared understanding of what constituted a breach or default scenario (World Bank Group, 2016: vi). There were also wider concerns about political interference in particular concessions (for examples, the cases of Paraná and Rio Grande do Sul mentioned above).

Control challenge

It took several years following the first wave of road concessions in 1994 to develop an institutional framework for road infrastructure regulation. This caused a lack of clarity around roles and responsibilities of different government bodies, in particular the role of the regulatory agency. ANTT was created in 2001 and had to develop a defined scope of responsibilities and autonomy from the Ministry of Transport. The latter conducted all feasibility studies surrounding concessions until 2005 (*Revista ANTT,* 2010). Frequent revisions of ANTT's regulation by other governmental bodies or ANTT directors who were politically appointed affected ANTT's autonomy and its ability to shield concessions from political interference. A clear definition of the roles of ANTT and its relation to other government bodies was therefore crucial to enhance the existing regulatory framework.

Uncertainty challenge

One of the main risks crucial to revenue and profitability of the concession was future demand. While feasibility studies, demand estimation and bankability of a project existed, other measures could be applied to mitigate risks surrounding traffic revenue: 'minimum traffic guarantees; availability based payments (in full or in part); taxation relief, and capital injections during the early years of a project to offset the overall capital cost of the project' (World Bank Group, 2016: ix). Other critical uncertainty-related risks involved exchange rate fluctuation and inflation; again, this called for provisions to allow for currency exchange risk adjustments (World Bank Group, 2016: ix). Other countries, such as Peru and Colombia, allowed for an indexation of tolls to take some account of exchange rate changes e.g. 50% of the exchange rate difference between local and US currency (World Bank Group, 2016: ix). Mechanisms for inflation risk adjustments have also not been applied consistently in the past. One method of allowing for an adjustment to higher rates of inflation would be to consider toll increases before a fixed review deadline if the Consumer Price Index exceeds a certain threshold as occurs in Jamaica and Peru (World Bank Group, 2016: ix).

Table 15: Regulatory challenges in the road sector

Regulatory challenge	Specific issue per sector
Commitment challenge	• Expropriation and issues around resettlement contribute to cost overruns on concessions • Concession contracts seem to suffer from a lack of clarity around termination clauses defining cases of default/breach/*force majeure* events • Concession contracts seem to lack clear procedures for change management/compensation • Wider issue of political interference with concessions (terms and conditions, running time, toll rate level etc.)
Control challenge	• ANTT was only created after the first wave of concessions and had to develop autonomy from Ministry of Transport • Frequent revisions of ANTT's regulation undermined its autonomy and ability to shield concessions from undue political interference • Clear definition of ANTT's role and relation to other government entities is crucial to enhance regulatory framework
Uncertainty challenge	• Concessions might lack proper mechanism to mitigate risks around demand and traffic revenue • Risks related to exchange rate fluctuations and inflation have to be addressed (e.g. allowing indexation of toll rates to take account of exchange rate changes; mechanisms for inflation risk adjustments to be applied more consistently and linked to a more flexible regime for toll rate reviews)

11. Appendix D – Regulatory issues and challenges in the ports sector

Short overview of the port sector

The port sector in numbers (CNT 2016b):

- Number of cargo-handling ports in 2015 (2010):
  - Public: 33 (32)
  - Private: 121 (100)
- Number of authorized transport companies in 2013 (2010): 139 (110)
- Cargo transported by type of navigation (tonnes, 2015):
  - Long course: 752,471,286
  - Cabotage: 211,813,481
  - Interior: 38,484,788
  - Maritime support: 2,488,791
  - Port support: 2,284,640
- Largest public ports by cargo handled (tonnes, 2015):
  - Santos: 101,578,071
  - Itaguaí: 57,303,101
  - Paranaguá: 41,080,336
  - Rio Grande: 22,930,995
  - Itaqui: 21,816,657

The port system in Brazil has witnessed a growth in independent private ports ('private terminals') located outside of public ports (Secretariat of Ports, 2016). Private terminals competed directly with public ports and accounted for almost double of the amount of cargo handling. They were developing at a faster pace than public ports, between 2005 and 2015 private ports have increased their cargo handling by 58%, while public ports increased theirs by only at 24% (ANTAQ, 2015a: slide 26).

The two types of ports had very different cargo profiles: private terminals accounted for most of the exports (66%) and most of the bulk cargo (66%) in tonnes; while public ports accounted for most of the imports (54%) and most of the container handling (76%) – although private terminals were witnessing growth in container handling as well (ANTAQ, 2015a: slides 10, 11).

Ports were distributed along the coast and the main rivers, with the largest amount of cargo handled in the South-West region (see Figures 16 and 17 at the end of this section). In addition, secondary ports began to engage in more integrated development strategies, including the development of logistics

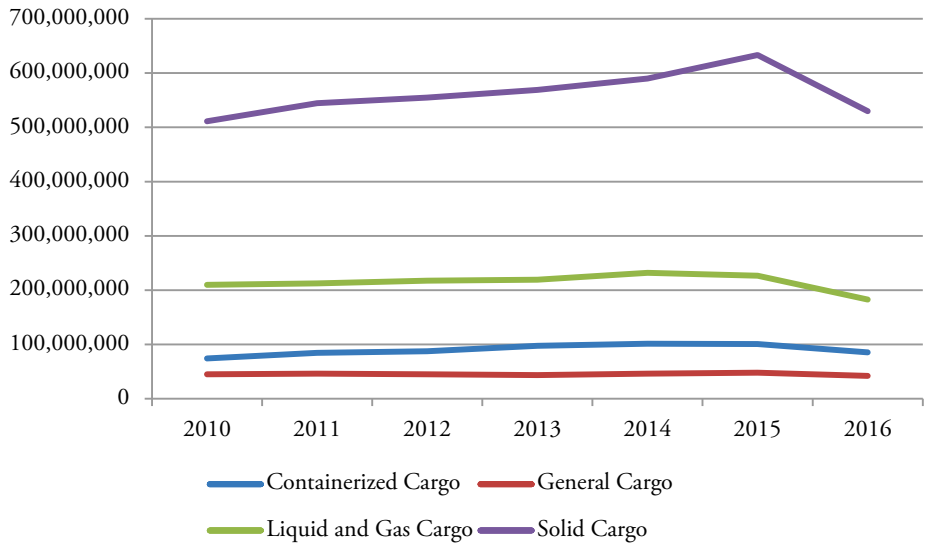
infrastructure connected to ports e.g. in Manaus (OECD/ITF, 2015: 62). However, while ports, in particular sea ports, played a critical role in the Brazilian economy, especially in terms of exports of natural resources and low value-added cargo (minerals and agricultural products), their quality was relatively low (services and limited capacity) compared to other countries with similar income levels (IMF, 2015: 14).

There was also an imbalance in the use of water transportation. A total of 752.6 million tonnes were transported by water in 2015. However, only 211.8 million tonnes were transported through cabotage (port to port along coastal routes) and 85.5 million tonnes through inland waterways (ANTAQ, 2015a: slides 10, 15, 19). This actual pattern contrasted with the existence of 29,000 km of naturally navigable waterways with possible extension to 63,000 km. However, at the time of writing, only 13,000 km were economically used (Allama, 2011: 7).

Limited productivity and efficiency of ports was, to a large extent, the result of (Savaris et al., 2013: 67–68):

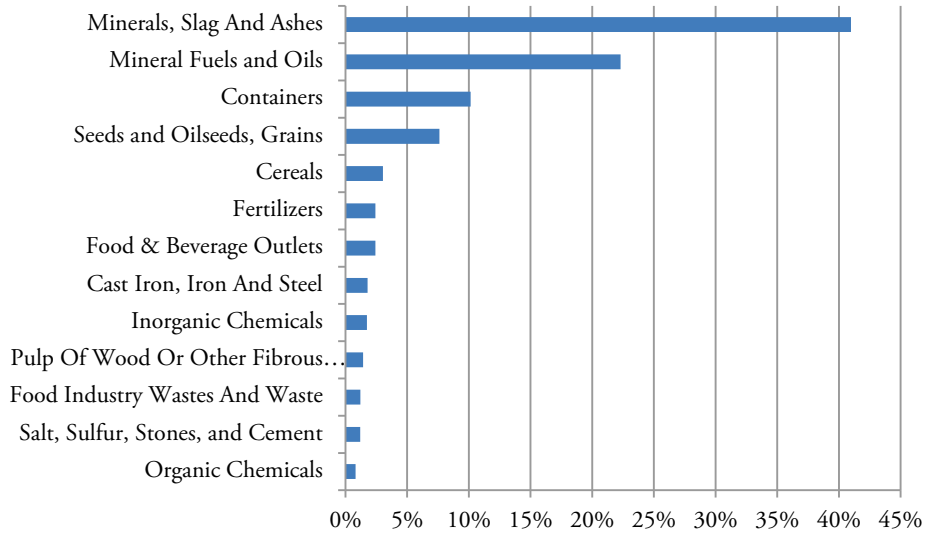
- limited draft capacity, which prevented large vessels from docking, thus making the Brazilian less competitive in the world trade market;
- limited interconnectivity of ports; and
- a complicated and highly bureaucratic customs process.

Figure 11: Waterway cargo transport volumes in tonnes



Source: CNT (Conferação Nacional do Transporte) (2016b)

Figure 12: Main types of cargo transported by the waterways (2015)



Source: CNT (Conferação Nacional do Transporte) (2016b)

Ports capacity and quality was limited, For example, only one of Brazil's public ports (Port of Santos, São Paulo) was in the top 50 list of 'best ports' in the world in 2015 at 39th position (World Shipping Council, 2015). Demand for infrastructure in Brazil spiked in particular for ports as foreign trade growth consistently outperformed GDP growth. Nevertheless, capacity demands remained unmet: Brazil occupied the 24th worst position in the world ranking of quality of port infrastructure and service (World Economic Forum, 2016a: 127).

Ports represented critical logistics bottlenecks with anecdotal evidence suggesting that there were about 10-mile long lines of trucks waiting at ports gates to unload agricultural goods (Savaris et al. 2013: 9). In terms of quality and efficiency of government customs service Brazil ranked in 86th position (WEF, 2016a: 127). None of the Brazilian ports ranked among the top global ports or in the Americas with regard to berth productivity in 2013 (JOC Group, 2014: 17–18).

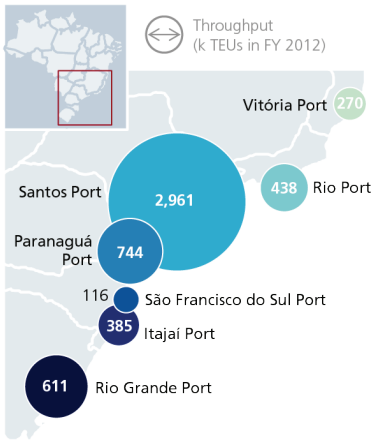
Draft capacity and the low productivity of ports, as well as the poor interconnectivity and access to ports, contributed to the creation of bottlenecks. Administrative delays for dredging activities impacted also on ports access (FIESP, 2016). Approach to the most important public container ports by either land or channels remained unsatisfactory or even critical in most cases (see Table 16; Savaris et al., 2013: 66). There were long waiting times for ships to dock, in particular for ships transporting solid bulk (agricultural commodities). Further challenges arose from the fact that improvements to port access involved government bodies at the federal, state and municipal levels, as well as a range of further actors, such as banks and other roadway and railway concessionaires (FIESP, 2016).

Capacity issues differed somewhat in the case of iron ore operations. Here, producers mostly operated their own cargo and since the wider regulatory framework allowed for private terminals development, supply could better track demand (Savaris et al., 2013: 66). Brazilian bulk iron ore terminals ranked very

high in 2014 in global comparison at first, second and fifth place (Ports Regulator of South Africa, 2015–16: 29).

Differences in waiting times across ports were also related to differences in land and channels access. In particular, there were examples of problems with access rights. For example, traffic to the port of Santos in Brazil had to be moved across modes for the last 22 km as the link to the port was leased to the private sector (OECD/ITF, 2015: 85; Acciaro and McKinnon, 2013: 17).

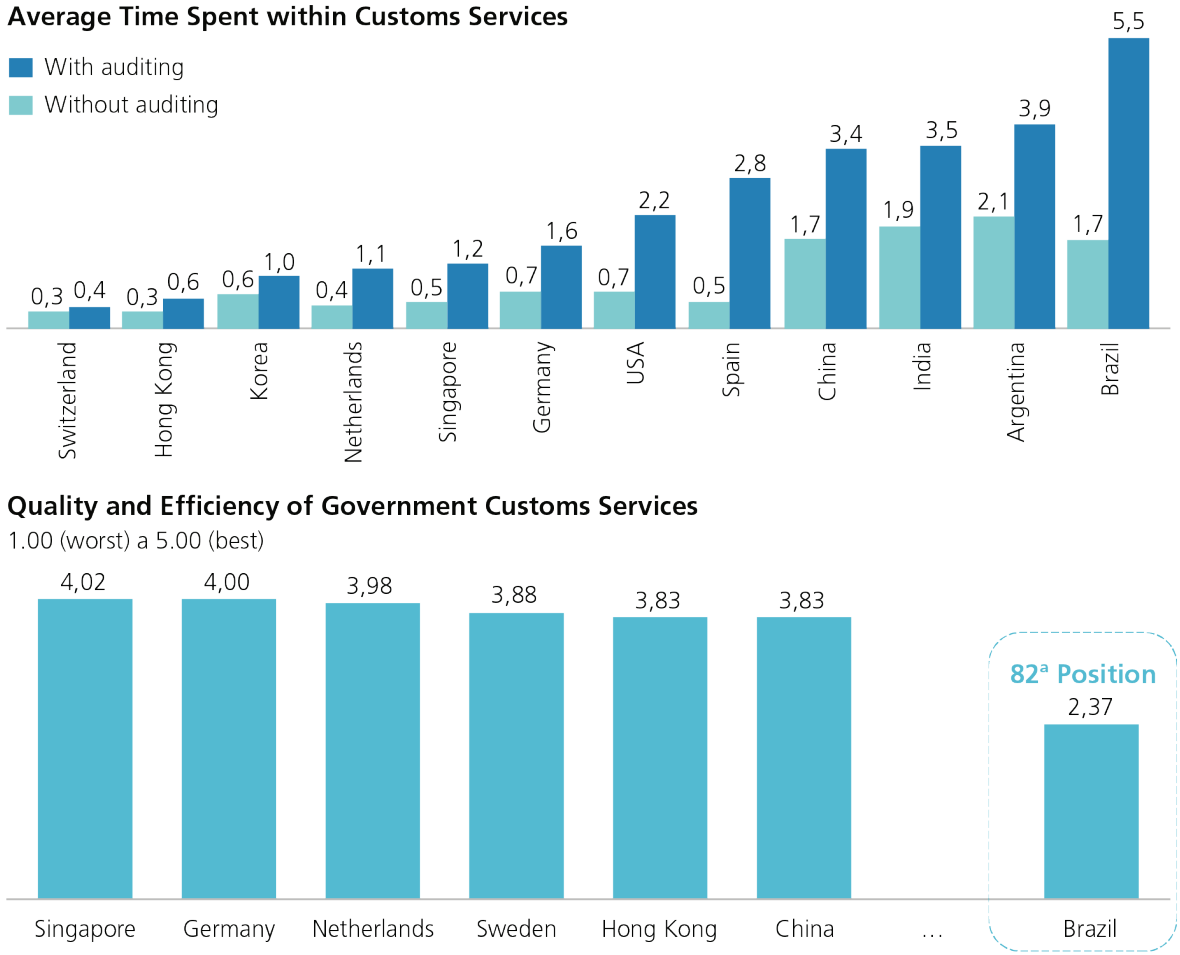
Table 16: Main Brazilian public container ports



	Access		Average waiting time to dock (hours)	
	Land	Channels	Container	Solid Bulk*
Vitória	Unsatisfactory	Unsatisfactory	9	45
Rio	Unsatisfactory	Satisfactory	6	N/D
Santos	Critical	Unsatisfactory	13	72
Paranaguá	Unsatisfactory	Critical	11	68
S. F. do Sul	Unsatisfactory	Unsatisfactory	14	64
Itajaí	Unsatisfactory	Unsatisfactory	20	N/D
Rio Grande	Excellent	Unsatisfactory	7	23

Access and average waiting times to dock in hours; solid bulk refers to agricultural commodities
Source: Savaris et al. (2013: 66)

Table 17: Comparison of draft capacity between selected Brazilian and other major international container ports



Source: Savaris et al. (2013: 67)

Finally, there were also potential future problems given the changing nature of shipping, especially as Post Panamax container vessels increasingly used global freight transport. The majority of main Brazilian ports were incapable of processing ships of the Post Panamax generation (see Table 17).

Customs-related processes (provided by the federal government) constituted another constraint. It involved several entities which were not coordinated (see Table 18 for a global comparison of customs processing times and service quality). In the port of Rotterdam, clearing goods took about one day on average, while in Brazil the average was five times higher (data from 2012) (KPMG, 2012: 12). Brazil also had complex and high import taxes which could be up to 60% (KPMG, 2012: 13).[60].

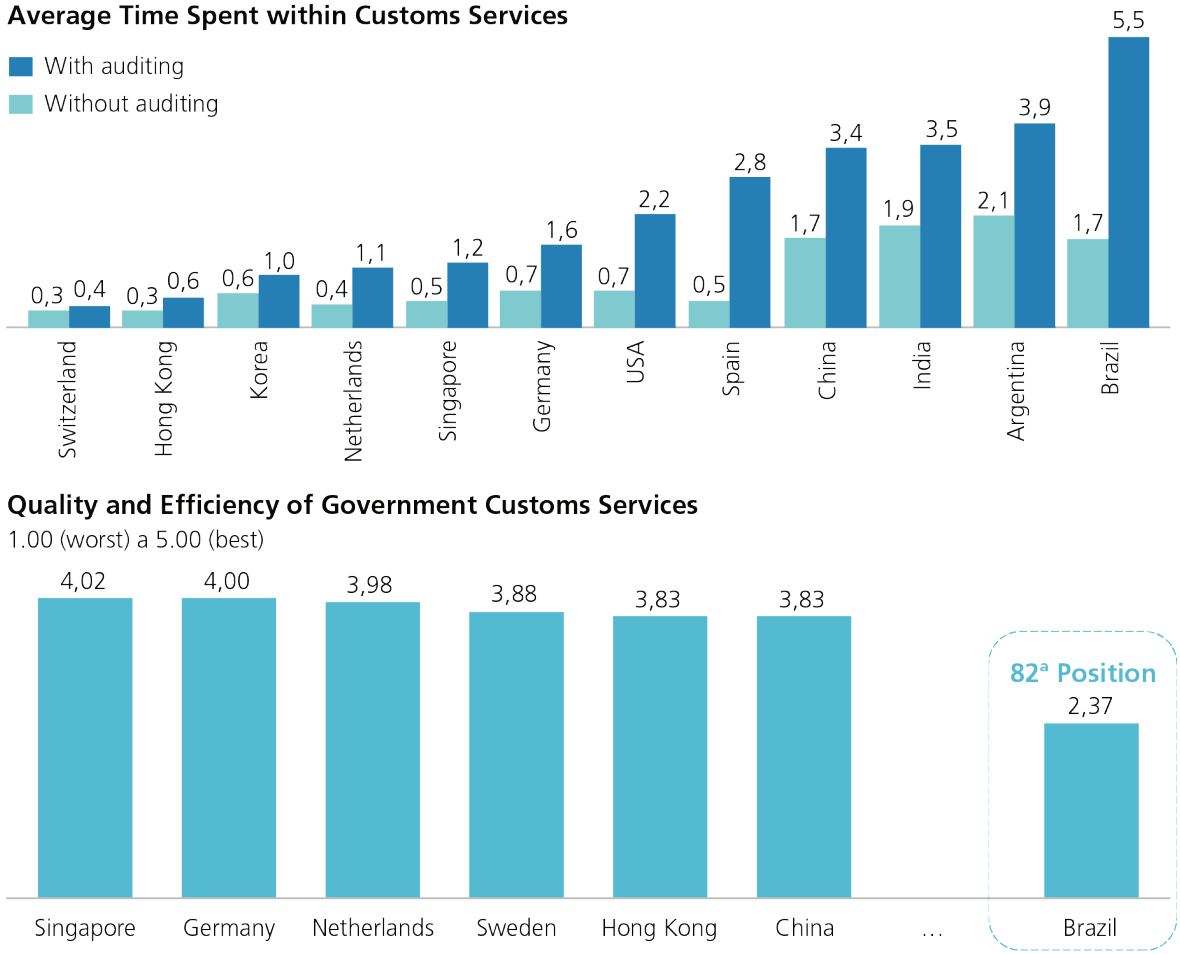
The port of Santos (Brazil's main port by import volumes) offered a good illustration of these problems. The average time of the customs process was above 15 days for containers. As an indicator of the inefficiency of the customs process, storage needs increased (Savaris et al., 2013: 68): warehousing

[60] World Bank (2017a) statistics covering 2012–2015 show that import taxes can be three times higher than the world weighted average (Brazil: 10.3%, World: 3.4%), <http://wdi.worldbank.org/table/6.6>

revenues had increased from 20% to 42% since 2012 as a percentage of total revenues (Savaris et al., 2013: 68). Delays in processing loads and in customs clearance meant that trucks spent hours, if not days queuing outside the port (Amann et al., 2014: 14).

As Brazilian ports handled 95% of the country's trade by volume and 85% by value, the modernization of the ports infrastructure represented a significant issue in order to support future trade prospects and global competitiveness (Amann et al., 2014: 14).

Table 18: Comparison of average time spent within custom services; quality and efficiency of customs services



Source: Savaris et al. (2013: 68)

Current regulatory approach and reforms for the port sector

In 1975 National Congress authorized the creation of a holding company called 'Empresa de Portos do Brasil S.A.' (Portobras) as a successor to DNPVN in the Ministry of Transport. DNPVN (Departamento Nacional de Portos e Vias Navegáveis / National Department of Ports and Navigable Waterways) was a public autonomous body, fully owned by the federal government. It had been responsible for preparing national port development plans. Portobras was set up to lead on the reform of the port sector. Institutional arrangements were held responsible for underinvestment and substandard functioning of the

sector. The sector was highly diversified. Some ports were managed directly by the federal government because of concession failures. Other ports were under concession either to the private sector or managed by the States under direct State management or by public autonomous bodies (autarquias). The creation of Portobras was intended to reduce further diversification of the ports' institutional arrangements.

However, Portobras was too remote from the actual ports it was responsible for, lacked transparency in handling large procurements, had large number of politically appointed officers and failed to encourage competition between state companies (UNCTAD, 1999: 8–12). Its major shortcoming was its failure to attract private investment in ports. It was disbanded in 1990 and its activities were transferred to the Ministry of Transport (UNCTAD, 1999: 8–12).

For the next two decades, development and oversight of the sector was driven by Port Authorities. The regulatory framework was based on a decentralized model in which port authorities (mostly state-owned companies) were responsible for developing the port zones they managed, including planning, regulation, and auctioning processes for concession rights (Savaris et al., 2013: 73). Wider regulatory reform in the port sector started in 1993 with the Ports Modernization Act, Law 8630 transferring port operations to the private sector, decentralizing ports administration to state and local level, and increasing administrative and financial independence of ports under federal jurisdiction (IFC, 2015: 19). The government's role was mainly to supervision and control while monitoring wider sector developments and national logistics chains (IFC, 2015: 19). Under the 1993 Ports Act, areas for cargo loading/unloading, as well as storage were transferred to private operation via concessions (Wanke and Barros, 2015: 14). Public port administrations became managers of the common-use areas responsible for maintenance, improvements and expansion of port facilities, including the development of infrastructure for water and land access (Wanke and Barros, 2015: 14). Prior to the Ports Act, public port authorities were responsible for the majority of ports operations and infrastructure (Wanke and Barros, 2015: 14).

Privatization was focused on the leasing of public port areas and infrastructures such as container terminals of all major ports (e.g. Port of Santos)[61] and also concessions on the management of public ports e.g. Port of Imbituba (Roviriego, 2013). Private terminals processed the majority of bulk and liquid cargo under authorization schemes. While levels of investment and productivity increased, consumers were only moderately affected due to the absence of significant competition between ports which resulted from a high concentration of traffic in the port of Santos (above 40%) and the low efficiency in the railway sector. While the port system and administration around it expanded and diversified, the main reform issues remained unresolved, such as the modernization of labour regulations, the separation of commercial and regulatory activities, the definition of responsibilities and role of Port Authorities and the lack of interest of key stakeholders like the CAPs (Conselhos de Autoridade Portuária/ Port Authority Councils) to foster competition given a market dominated by vertical integration between ship owners and port operators.

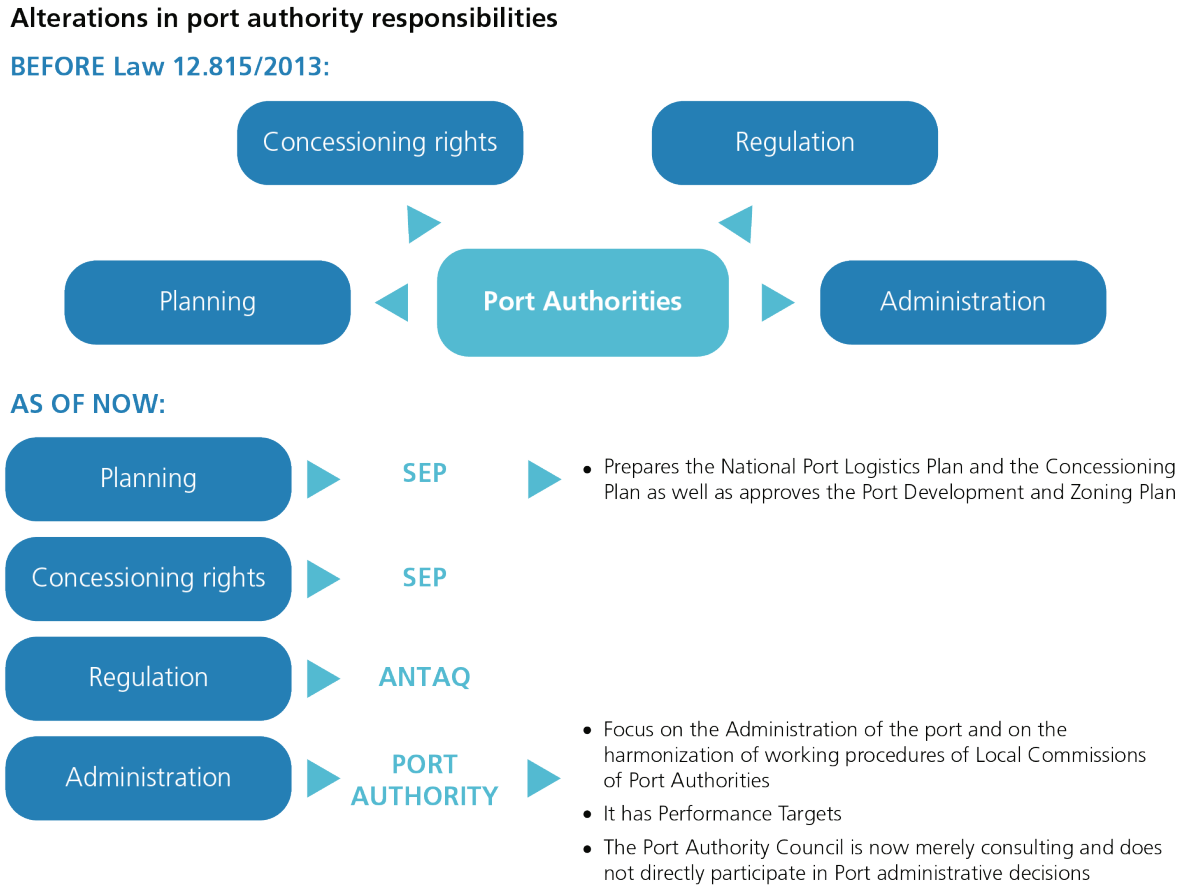
Another major reform was introduced with the regulation under the Decree 6620/2008, aiming at 'strengthening [the] regulatory framework and establishing rules for concessions for new ports' (Moraes, 2010: 15). However, red tape, limited choice between port terminals, interruptions during port

[61] See the state's docks company website on Porto de Santos <http://189.50.187.200/lei_acesso/proaps.asp>

constructions, and delays in the processing of big container ships persisted (Moraes, 2010: 15). This wider regulatory model for the sector had also limited success: concessions for the private sector were only granted for 11 terminals in the 12 years before the subsequent wave of reforms in 2013 (Savaris, 2013: 73).

In 2013, another sector reform was introduced with New Ports Law 12815/13 which changed the previous regulatory framework established under Law 8630/93. One of the biggest changes was the elimination of restrictions for private terminals to handle third-party cargo. This allowed them to compete against concession holders within public ports, therefore increasing inter-port competition. Furthermore, authorizations for new private terminals became easier to obtain: since the New Ports Law 67 private terminals were authorized, which already accounted for almost half of the total cargo handled by private terminals (Secretariat of Ports, 2016; ANTAQ, 2015a: slide 37).

Figure 13: 2013 changes to regulatory framework for the port sector



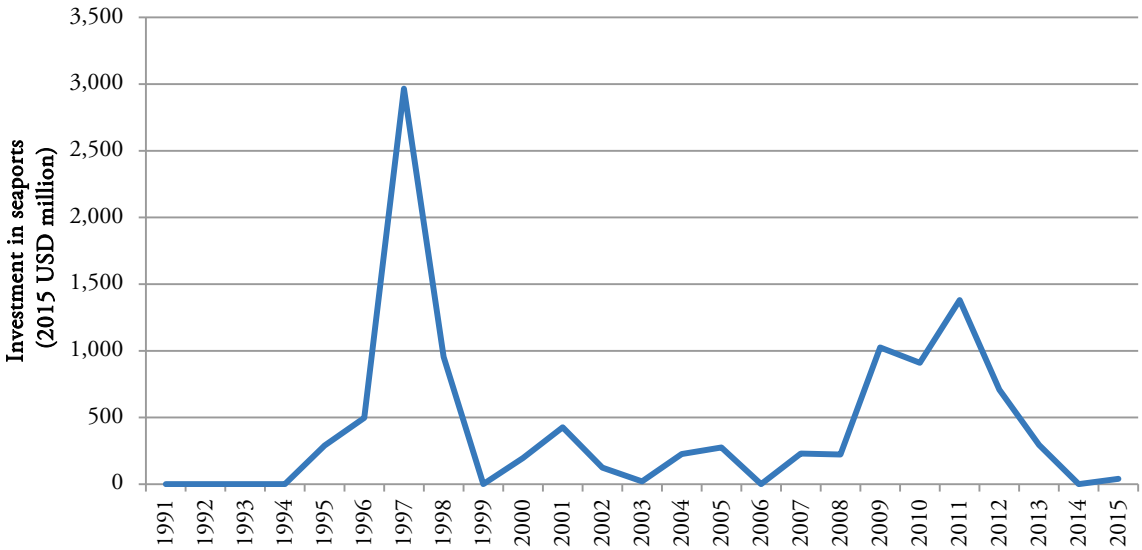
Source: Secretariat of Ports (2014a)

The New Ports Law 2013 introduced a centralized model which split responsibilities across the SEP, ANTAQ and Port Authorities. ANTAQ oversaw authorizations, leasing and concession contracts, and auctions for concessions (Secretariat of Ports, 2014a). The CAPs which earlier had been executive committees composed by port stakeholders was turned into consultative bodies with no decision-making power (Savaris et al., 2013: 73).

However, it remained questionable whether the reform efforts encouraged an increase private investment in ports over time (see Figure 14 below; however this picture looks different when considering private terminals only where for which investments have increased since the reform (ANTAQ, 2015a, slide 37). Regulatory reform in the port sector lacked a well defined institutional framework that addressed overlapping responsibilities and conflicting interests across the different sector agencies (IFC, 2015: 19–20).

More generally, the only progress seen in PIL contracts was in the ports sector because some cargo handling areas at the port of Santos were being awarded. Under PPI two priority projects were initially identified which were a fuel terminal at Santarém and a wheat terminal at Rio de Janeiro (Projeto Crescer, 2016). Nevertheless, ongoing political changes and reform affected growth expectations for the port sector in 2016 due to the suspension of expected port concessions and the scrapping of the Special Ports Ministry (SEP) which was transferred into the Ministry of Transport (BMI Research, 2016; JOC.com, 2016).

Figure 14: Public-private investment in public seaports over time



Source: World Bank PPI database, (2017b)

Regulatory issues

Ownership and divestiture

Port development in Brazil was based on different ownership patterns over time.

Internationally, there are four main arrangements for port ownership (World Bank, 2007):

- Service Port: a public authority owns and manages the infrastructure and the superstructure, directly providing port services to users;
- Tool Port: a public authority owns and manages the infrastructure and the superstructure, but some areas of the port are leased to the private sector to provide port services;

- Landlord Port: a public authority owns and manages the infrastructure and charges tariffs to the companies acting within the port, while the private sector owns the machines and equipment to deliver port services in specified areas leased to specific purposes;
- Private Port: there is no public authority; a private agent owns the infrastructure and the superstructure and is responsible for all port activities and services.

Between 1910s and 1930s ports were nationalized (Service Port), while during the military dictatorship from 1964 to 1985 the development of ports was not considered a priority. In 1993, the federal government initiated a decentralization process with a set of new concessions and leasing (Landlord Port) as well as authorizations for developing private terminals (Private Ports) (Roviriego, 2013; Weschenfelder, 2015). An addition to the Landlord Port model was the Concession Model, where the infrastructure management was delegated to a private sector agent. Concessions, leasing and authorizations became the three main models for private exploitation of ports, a process which was furthered by New Ports Law 2013. After the main privatization wave in the 1990s and subsequent reforms in the 2000s, a more diversified system of ports emerged, with private companies (mainly in the area of mining) building their own private terminals under authorizations schemes that could compete with public ports; and concessions and leases were awarded to private operators in order to either run a port fully or to run parts of a public port.

Among the 37 public ports under the responsibility of the Secretariat of Ports (SEP – now part of the Ministry of Transport), 18 were managed by the private sector or the state and city governments; and 19 were managed by dock companies, hybrid private and public companies that had the Federal Government as the major stockholder (Secretariat of Ports, 2015). While capacity in the port sector expanded over time since the 1990s and different models for ownership and operation of ports emerged, there was still a wider need for fostering competition. Anti-competitive behaviour by larger port operators has limited intra-port competition. For example, there was cross-ownership among terminals in the ports of Santos and Rio de Janeiro (Correa et al., 2007).

New commissioning ('greenfield sites')

Despite the reforms in the port sector in the 1990s, the wider issue of limited inter-port competition and an insufficient number of new commissions of 'greenfield' projects remained. Regulatory barriers hampered wider private investments outside of public ports, since private companies had to prove that they handled a certain amount of their own cargo in order to justify investments in a new port (Savaris et al., 2013: 65). The emergence of private terminals projects resulted in regulatory disputes led by private concessionaires of public ports. The government reacted in 2008 with the Decree 6620 which restricted authorizations for the building of private ports to companies that could justify the investment for handling their own cargo only – limited capacity expansion and saturation of the ports system was the result (Savaris et al., 2013: 65).

This government measure affected largely ports processing containers and solid bulk (mainly agricultural commodities) since capacity expansion here was predominantly based on public investment and government activity. In the case of iron ore, producers were less constrained by regulation and able to build their own private terminals (Savaris et al., 2013: 66; ANTAQ, 2015a). Until 2013, private terminals

operators could only handle their own cargo. Iron ore producers used authorizations for building own terminals or became shareholders in logistics companies which operated their own terminals and (connected) railways. Since the change in regulation about 180 private terminals had been authorized as of July 2016 (Secretariat of Ports, 2016), including terminals that handled agricultural commodities. However, many of the 'greenfield' projects for private terminals lacked proper documentation, leading to delays and budgetary conflicts (ACS, 2015).

While the New Ports Law from 2013 provided for some overall reform of the sector in terms of wider investment opportunities and the issuing of authorizations, administrative barriers, for example obtaining licences and permissions, remained high.

Licensing processes were lengthy as several permits and licenses had to be obtained from federal, state and local agencies. At the time of writing, the best case scenario for the completion of a 'greenfield' would be an estimated five years, from environmental impact study to the issuance of operating licence (Savaris et al., 2013: 76). Many 'greenfield' projects in the port sector took more than ten years to become fully operational. This highlighted the wider need to streamline administrative and licensing processes in order to move from the planning phase to project realization (Savaris et al., 2013: 72). In the case of Portonave, Itapoá, Embraport, Açu and the Brasil Terminal Portuário (BTP) projects took up to 14 years to be concluded with five to seven years alone spent on the licensing process alone (Savaris et al., 2013: 76).

Figure 15: Port investments over time

Private Ports	PortoNave	Itapoá	Embraport	Açu	BTP
Start year	1997	1997	1999	2006	2007
Environmental authorization	2005	2003	2006	–	2009
Authorization from Antaq	2004	2005	2006	–	–
Start of construction	2005	2008	2011	2007	2010
Start of operation	2007	2011	2013	2013	2013
Time to completion	10 years	14 years	14 years	7 years	6 years

Source: Savaris (2013: 76)

In addition to that, port capacity expansion to serve Brazil's hinterland better was likely to require the Landlord Port/Concession Model. This model was expanded by allowing more developments of private ports. However, crucial decisions on port concession agreements remained at the federal stage that were critical for efficiency levels, e.g. types of cargo to be prioritized per region, improvements of port connectivity via channels, highways and railways (Wanke, 2013: 152). There was a lack a vision for developing 'logistics corridors' at the federal level, while wider decision-making power about connectivity investments remained with the federal government (Wanke, 2013: 152).[62] Logistics corridors were put

[62] An example could be the development and use of dry ports, whereby red tape during the customs process increased the need on the side of exporters and importers to make increased use of dry ports while the integration of dry and sea ports has not been facilitated over time (see Ng et al., 2013: 54).

forward as a solution to improve port connectivity by providing better transport and logistics services (Wanke, 2013: 152).

Concession and franchises

The operation of public ports and port facilities was mainly done via concessions (for the management of the port) and leasing contracts (for areas within a port) awarded to the private sector through public auctions conducted by the National Waterway Transportation Agency (ANTAQ). Outside of public ports, companies could be granted authorizations for the exploration of private terminals via adhesion contracts (Secretariat of Ports, 2014a, 2014b).

Under the New Ports Law 2013 (Secretariat of Ports, 2014a) private parties that leased public port terminals or were authorized to exploit the private terminals were responsible (among other things) for:

- expansion, modernization and optimization of the infrastructure and superstructure contained within the statutory ports;
- promoting modernization and increasing efficiency of port management within the statutory ports;
- increasing competition through incentives for private sector participation and providing assurances for full access to statutory ports, facilities and port activities.

This model in the port sector fitted mostly within a 'Landlord Port' structure whereby a public sector port authority entered into leasing contracts for a series of individual terminals, i.e. the public authority as the owner leased specific areas and activities to a private operators responsible for equipment, port operations and management of terminals, while the administration of common-use infrastructure and investment in land and waterway access to ports remained with the public sector, with possible delegation through concessions to the private sector or state or city governments (Wanke and Barros, 2015: 14). Private partners in charge of the leased areas had the right to amend contracts in the case of financial or economic imbalances. The Landlord Port model as well as concession contracts enabled an expansion of Brazilian port capacity especially when looking at the level of container handling, e.g. between 1996 and 2005 total import/export revenue in Brazilian public ports grew 6.6% per year. Expansion centred mainly around container loads and was driven by private terminals concession contracts from 1995 for the ports of Santos, São Francisco do Sul, Rio Grande, Rio de Janeiro, Paranaguá, Vitoria, Itaguaí, Salvador, Itajaí, Vila do Conde, and Imbituba (Wanke and Barros, 2015: 14–15).

Several regulatory issues were related to the way concessions in the port sector were designed particularly in comparison to authorizations. Concessions were issued for providers that managed public ports while authorizations were issued for the development of new private terminals (see Table 19).

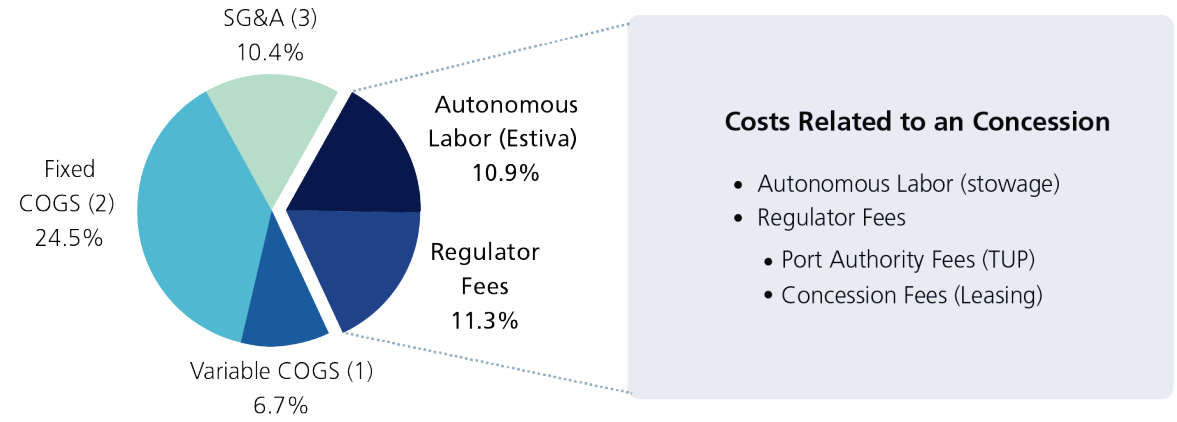
Table 19: Key differences between concessions and authorizations

Main points	Concessions (public)	Authorisations (private)
Payment of government fees	Concession fee and port dues	None
Investments responsibilities	Superstructure and often operational infrastructure	Superstructure, operational and basic infrastructure
Labour	OGMO	Free choice
Business horizon	Limited by contract	Limitless
Assets	Transference at the end of the contract	No transference is required
Universality principal*	Yes	No

*Public terminals must meet all service requests, while private ports are not bound by universality requirements.

Source: Weschenfelder (2015: 50)

Table 20: Breakdown of public ports costs



Source: Savaris (2013: 74)

An increase in private terminals projects led to intense regulatory disputes which forced the federal government to step in and limit private port expansion (see above) (Savaris et al. 2013: 65). Furthermore, the need for sector oversight and strategic planning increased significantly. At the time of writing, the sector operated under three main and very different management models: public ports under government management, public ports with management assigned to the private sector, and fully private terminals under authorization. This raised questions around how to design a 'level playing field' in terms of competition among them, given also very different conditions in terms of access, interconnectivity, availability of intermodal transport solutions, and location to main production areas.

Wider uncertainties also arose from the lack of clarity in terms of future auction criteria and whether existing concessions would be renewed or re-auctioned. While the auction criteria under the New Ports Law 2013 were initially based on the highest cargo handling capacity, lowest tariff or lowest handling time

offered by the bidder, a new Decree 8464/2015 introduced new criteria such as higher levels of private investment, lower levels of public investment, best technical proposal or highest grant. Although some of these new criteria were easier to measure, it remained unclear how they would be applied.[63]

Operations and management

Survey responses from the 2016 World Bank's Logistics Performance Index (LPI) scorecard provide insights into the performance of the port sector in terms of operations and management (percentages are compared with averages from the region, Latin America and Caribbean):[64]

- Level of Fees and Charges – port charges: percentage of respondents answering high/very high 72.73% (52.44%)
- Quality of Infrastructure – ports: percentage respondents answering low/very low: 63.64% (45.09%)
- Competence and Quality of Services – maritime transport: percentage of respondents answering high/very high: 27.27% (33.84%)

The wider performance quality issues across various indicators (overall quality of infrastructure, efficiency and capacity, as well as customs process) have been highlighted above. Another wider issue impacting port management was the availability of skilled staff for port management. Across the different types of ports, there were also significant differences in salaries and labour rights. One of the key challenges until most recently was the lack of fully professional port management, particularly in the public sector, where levels of salaries could not compete with private sector concession holders or private ports under authorization. Furthermore, high-level managers of port authorities were widely regarded as political appointees that lacked adequate experience (World Bank, 2012b: 58).

Additionally, the general obligation for public ports under private concession to hire workers from the List of the Port Labour Management Body (Órgão de Gestão da Mão-de-Obra, OGMO) represented a competitive disadvantage compared to private ports operated under authorizations. The 2013 New Ports Law even extended the restriction from workers loading and unloading a vessel to other types of tasks and professions e.g. ground handling, cargo verification, vessel repair (Savaris et al., 2013: 72).

[63] Information from interview conducted on 9 July 2017.

[64] World Bank (2016): LPI scorecard uses six key dimensions to benchmark a country's performance and also includes an derived overall score that allows a comparison with the world, the region or income group. The LPI builds on survey asking respondents about their experience in international logistics along a set of questions per dimension.

Table 21: Regulatory issues in the port sector

Regulatory issue	Specific issue per sector
Ownership and divestiture	• While overall port capacity has expanded since privatization in the 1990s, wider need for fostering competition is still given • Anti-competitive behaviour by larger port operators has also limited inter-port competition affecting the sector's attractiveness for investments by outsiders
New commissioning ('greenfield sites')	• Previous regulatory framework encouraged only limited inter-port competition and operators had limited incentives to expand capacity • Despite 2013 reform, issue of limited inter-port competition and an insufficient amount of new commissions of 'greenfield' projects remained • Regulatory barriers hampered private investments outside of public ports affecting mainly ports processing containers and solid bulk (agricultural commodities) since capacity expansion for these was mainly based on public investment • New Ports Law (2013) lifted restrictions on authorizations; however administrative barriers remain (obtaining licenses and permissions) • Lack of federal strategy for developing logistics corridors serving hinterland could still lead to situation where physical infrastructure does not meet demand adequately
Concession and franchises	• Landlord Port model, enabled expansion of Brazilian port capacity widely in particular when it comes to handling of containers • Potential cost advantages of between 25% and 35% for private ports due to the absence of labour law restrictions and concession fees; will increase competitive pressure for concession holders, but can also lead to disputes • Wider uncertainty around auction criteria for new concessions and early renewal of concessions remained after 2013 reform
Operations and management	• Wider performance quality issues across various indicators (overall quality of infrastructure, efficiency and capacity, customs process) • Limited availability of skilled staff for port management affects mainly public ports which cannot compete with offers from private sector concession holders/private ports under authorization • Obligation for public ports under concession to hire workers from the List of the Port Labour Management Body (OGMO)

Regulatory challenges

Commitment challenge

A central issue was the (early) renewal of concessions. Under the New Ports Law 2013, 94 terminals (mostly liquid bulk) for which concession contracts were signed before 1993 were put up for re-auction. Local port authorities had simply been granting automatic renewals for these terminals until the New Ports Law was enacted, therefore re-auctions were seen as a potential trigger for legal proceedings by contract holders against government (Savaris et al., 2013: 72–73). Furthermore, concession contracts signed under Law 8630/93 had individual clauses on renewal (25 years of concession term as standard, renewable for another 25 years to be negotiated between concessionaires and granting authorities). Concession contracts with an explicit renewal provision could be renewed early, but renewal was at the discretion of the granting authority and conditions under which this would be granted were unclear (Savaris et al., 2013: 72–73).

Control challenge

Regulatory reform in the port sector between the early 1990s and early 2000s stopped mid-way and did not establish a well-defined institutional framework (IFC, 2015: 19). In particular, this related to concerns about the role of the federal government with regard to planning, regulation and finance; the strategic underpinning and criteria for port decentralization to states and municipalities; the restructuring of the dock companies (Companhias Docas); the role and responsibilities of Port Authority Councils (Conselhos de Autoridade Portuária – CAP); and the purpose and viability of OGMO, the labour management unit (IFC, 2015: 19).

While the 2013 reform restructured the institutional framework for the port sector, it was questionable whether this reform led to a streamlining of the administrative backbone of the sector, whether it clarified the roles and relationships of the main actors (SEP/Ministry of Transport, ANTAQ and Ports Authorities) and whether it fundamentally improved the quality and speed of auction, authorizations and licensing processes (Savaris et al., 2013: 73). It was also arguable whether core actors, like ANTAQ, were locationally too removed from specific local issues and demands of each regional port (Savaris et al., 2013: 72–73).

Uncertainty challenge

The level and distribution of demand for port services is likely to be altering in the future, largely as a result of changes in production areas and demand for resources and commodities. Dias et al (2016) show that the patterns of agricultural production in Brazil have shifted North-West over the past few decades. This trend is expected to continue in the future. Similarly, new discoveries of natural resources and the gradual decline of existing production sites are likely to affect the supply of export items.

Table 22: Regulatory challenges in the port sector

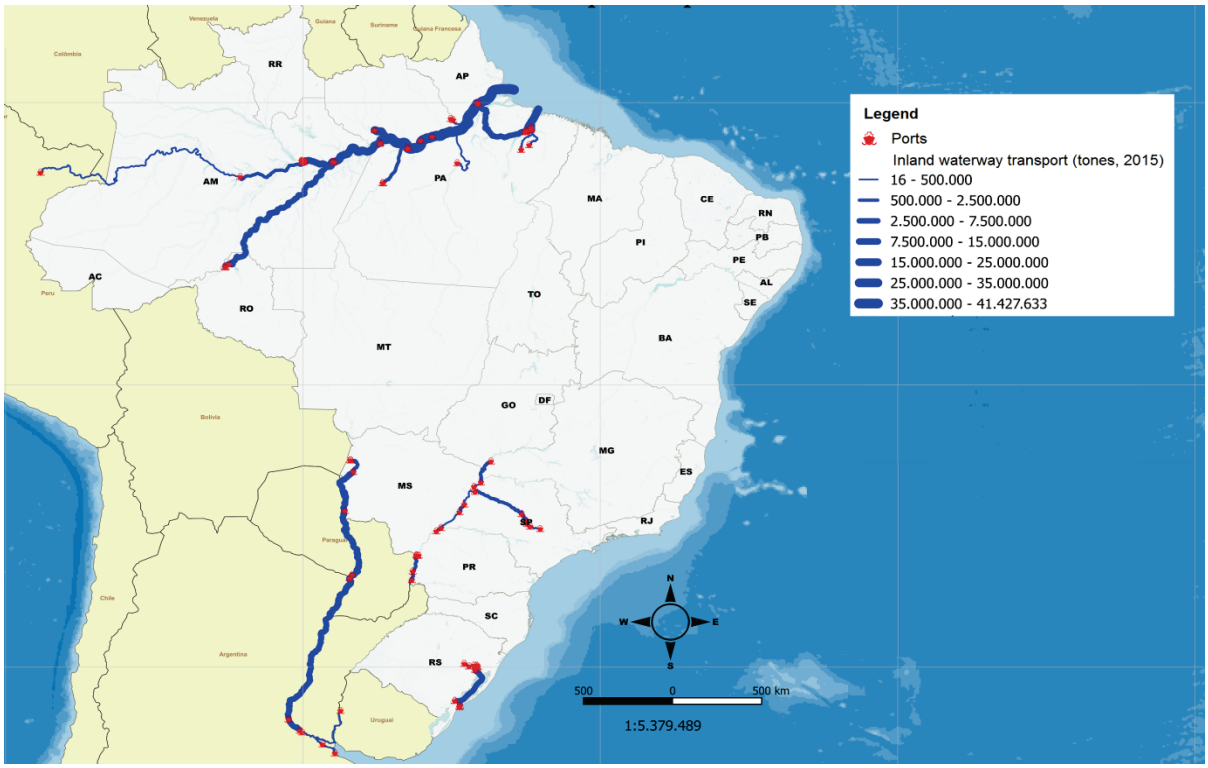
Regulatory challenge	Specific issue per sector
Commitment challenge	• (Early) renewal of leases – re-auctions of leases signed before 1993 were granted automatic renewal until the New Ports Law was enacted; re-auctions are already a source for legal discussions • Lease contracts signed under Law 8630/93 with an express renewal provision could be renewed early but approval was at the discretion of the granting authority and conditions were unclear
Control challenge	• Overlapping responsibilities and conflicting interests of sector bodies • Regulatory reform in the port sector between the early 1990s to early 2000s did not generate well-defined institutional framework • 2013 reform might have also not led to streamlining the administrative backbone of the sector or clarified the roles and relationships of main actors (SEP/Ministry of Transport, ANTQA and Ports Authorities) • Bodies on federal level might be too removed from specific local issues and demands of each regional port • Quality and speed of auction and licensing processes remains low
Uncertainty challenge	• Level and distribution of demand for port services likely to evolve • Relevant factors include: shift in patterns of agricultural production, new discoveries of natural resources and depletion of the old ones; link between ports and other hinterland logistics infrastructure in Brazil

Table 23: Main commodities transported by waterways

Nature of load	Disembarkation		Embarkation		Total	
	Goods	Amount (tonnes)	Goods	Amount (tonnes)	Goods	Amount (tonnes)
Solid	Fertilizers	23,724,689	Iron Ore	328,698,867	Iron Ore	330,048,307
	Mineral Coal	16,004,601	Soy	46,449,648	Soy	49,712,783
	Bauxite	13,798,593	Corn	26,923,185	Bauxite	35,651,753
Liquid and gas	Fuels and Mineral Oils	148,696,025	Fuels And Mineral Oils	43,791,436	Fuels And Mineral Oils And Products	192,487,461
	Caustic Soda	3,099,587	Org. Chemicals	4,334,156	Org. Chemicals	6,799,962
	Organic Chemicals	2,465,806	Ethyl Alcohol	2,420,804	Caustic Soda	4,256,286
General	Steel Products	3,194,287	Steel Products	9,244,855	Steel Products	12,439,142
	Semi-Trailer Baú	2,217,320	Cellulose	7,805,226	Cellulose	9,148,765
	Wood	1,591,375	Plastics	2,365,103	Semi-Trailers	4,482,679
Containers	Plastics	4,388,413	Frozen Meat	4,012,994	Miscellaneous	6,838,708
	Miscellaneous Loads	3,387,458	Miscellaneous	3,451,249	Plastics	6,153,609
	Organic Chemicals	2,642,736	Load Support	2,676,469	Frozen Meat Meat	4,222,960

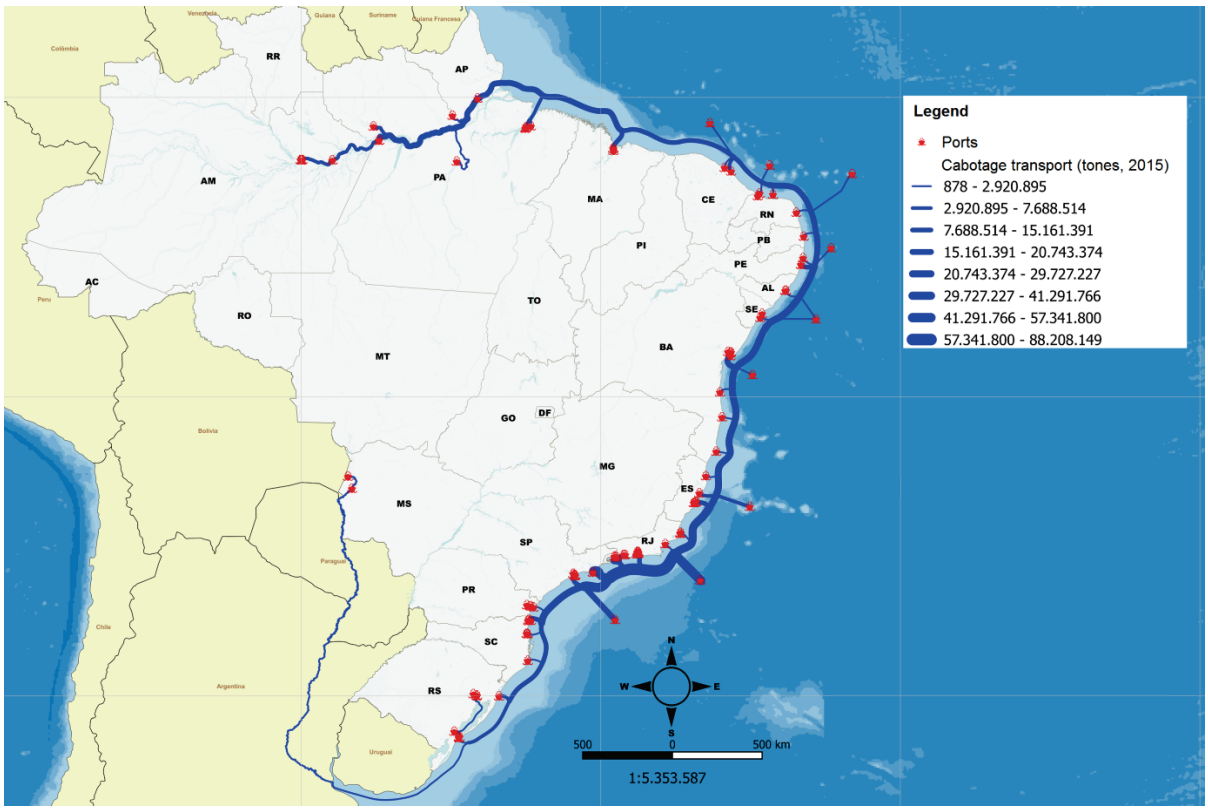
Source: CNT (Conferação Nacional do Transporte) (2016b)

Figure 16: Inland waterway transport



Source: ANTAQ (2015c)

Figure 17: Cabotage transport



Source: ANTAQ (2015b)

12. Appendix E – Regulatory issues and challenges in the airport sector

Short overview of the air transportation sector

The air transportation sector in numbers as of 2015 (CIA, 2017):

- 698 airports with paved runways (2013)
    - 7 over 3,047 m
    - 27 between 2,438 and 3,047 m
    - 179 between 1,524 and 2,437 m
    - 436 between 914 and 1,523 m
    - 49 under 914 m
- 9 registered air carriers
- 443 registered aircrafts operated by air carriers
- 102,039,359 annual registered passenger traffic
- 149.393 million mt-km registered annual freight traffic

Air transportation in Brazil was largely about passenger transport: public airports served 117 million passengers in 2014 (Steer Davies Gleave, 2014: 36), with the twenty largest airports accounting for around 90% of passenger traffic, and the five largest airports accounting for around 50% i.e. São Paulo (GRU), Brasília (BSB), São Paulo (CGH), Rio de Janeiro (GIG), and Confins (CNF) (Morgan Stanley, 2010: 49). Passenger transportation has also doubled between 1997 and 2013, which was mainly attributed to declining fare prices (that peaked at a historical low R$ 0.35 per km in 2012 (Lee, 2013: 3).

The largest Brazilian airports were considered to be saturated or soon to be saturated in 2013 (Credit Suisse, 2013: 42). In comparison, only 0.4% of freight was transported by airplane which amounted to 1.45 million tonnes 2014 processed by four main airports: São Paulo (GRU), Campinas (VCP), Manaus (MAO) and Rio de Janeiro (GIG) (NAG, 2015: 9). Apart from the nature of the freight, significant barriers to freight transport by air were high transportation cost, which was up to 38 times higher than the costs for using railways and six times higher than the costs for using roads (Steer Davies Gleave, 2014: 37–38). Additional challenges to air freight transportation in Latin America included price sensitiveness to fuel prices and economic cycles (IDB, 2010: 53).

Brazil was ranked 95th among 138 countries on the quality of air transportation infrastructure, according to the Global Competitiveness Index (GCI) 2016-2017(World Economic Forum 2016a: 127). The

country witnessed a significant increase of quality since the last round of public works and concessions to the private sector,[65] improving 39 positions in the GCI when compared with the 2012 ranking.

However, Brazil was still lacking behind other BRICS counterparts (Russia was on 65th position) (World Economic Forum, 2012b: 117). The infrastructure had deteriorated as around 0.05% GDP was invested in air transport infrastructure between 2002 and 2012. This meant that only 50% and 60% of the allocated budget were invested (Credit Suisse, 2013: 2, 13, 38, 42). The staging of the 2014 World Cup and the 2016 Olympic Games in Brazil turned air transport into a political priority, resulting in private sector concessions for five large airports in 2012 and 2013 (Credit Suisse, 2013: 38). Concessions for four additional airports were expected to be auctioned in 2017.

Current regulatory approach and reforms for the air transportation sector

Regulation of air transport infrastructure in Brazil developed over the last three decades. Until the end of the 1980s competition in the sector was highly restricted with only four national and five regional airlines. These were subject to military oversight and a regime of fixed ticket prices. The Federal Deregulation Programme in 1990 established a new set of price bands for airline tickets. Fixed price bands were finally eliminated towards the end of the 1990s.

While competition grew with the introduction of private airlines such as GOL Linhas Aéreas, revenues decreased over time and various companies went out of business. The bankruptcy of VASP and Transbrasil between 2002 and 2004 encouraged the Department of Civil Aviation to re-establish minimum price levels. A regulatory agency for the sector (ANAC) was created in 2006 which liberalized ticket prices once again. The Secretariat of Civil Aviation (SAC) was created at the ministerial level in 2011, the same year in which the first 'greenfield' airport was auctioned (Natal – NAT).

The institutional structure of air transportation regulation consisted mainly of the regulatory agency ANAC. It drew on staff from the former Department of Civil Aviation which was linked to the Brazilian Air Force. Furthermore, a state-owned company Infraero (created in 1973) managed public airports and participated in the management of private airports. The Secretariat of Civil Aviation was in charge of the sector at the ministerial level, acting as the executive-secretariat of the Council of Civil Aviation (Credit Suisse, 2013: 40). Compared to the land transportation regulator ANTT, ANAC experienced a larger degree of independence from the sector line ministry when organizing airport auctions.[66] However, political influence on the appointment of ANAC's board of directors continued to be high (Azumendi, 2016: 7).

A first round of three large airports concessions were auctioned in 2012 (Guarulhos – GRU, Viracopos – VCP and Brasília – BSB), followed by a second round of two airports concessions launched in 2013 (Galeão – GIG and Confins – CFN) (Credit Suisse, 2013: 40, 43). Bidders were not allowed to win more than one concession. Auction criteria were based on the highest concession fee offered to the government. Annual concession payments were adjusted for inflation with an additional contribution based on gross

[65] Information from interview conducted on 28 November 2016 (B).

[66] Information from interview conducted on 28 November 2016 (C).

revenue (fixed for each airport, 10% in the case of Guarulhos, 5% for Viracopos, and 2% for Brasilia). Concessionaires were also required to make investments (R$5.2 billion for Guarulhos, R$8.7 billion for Viracopos and R$2.8 billion for Brasilia).

This round of concession auctions resulted in a total of R$25 billion in grant payments to be made over 25 years, and around R$4 billion of short term payments. However, no strict requirements for auction participation existed. For the second round of concessions auctioned in 2013 the government initially increased the technical qualification requirements from 5 million pax/year to 35 million pax/year, as well as a minimum of 25% equity per consortium (this was later reduced to 12 and 22 million pax/year). This policy shift aimed to attract the international airports operators (Credit Suisse, 2013: 4).

During the concession design, advice from national and international bodies was provided, such as the association of private banks and BNDES (EBP, Estruturadora Brasileira de Projetos) and the International Finance Corporation (Lee, 2013: 3–43). The government also used non-exclusive requests for proposals (PMI, Procedimento de Manifestação de Interesse), whereby private sector consultants and interest groups developed projects intended to identify gaps in the infrastructure (ANAC, 2010; PPP Brasil, 2013). Furthermore, the applied airport concession model required that the state-owned company Infraero maintains 49% ownership of each concession.

These auctions were marked by aggressive bidding behaviour and high bids. Notably, for the Guarulhos concession the value of the winning bid was R$16.2 billion, 26% more than the second highest bid (R$12.8 billion), while the Galeão concession attracted a bid value of R$ 19 billion which was four times the minimum bid value set by the government (Lee, 2013: 3, 8). However, what was initially considered as a success for attracting high levels of investment led to a series of renegotiations in a short period of time after concessions had been awarded. The most prominent case was the concessionaire for the Galeão airport, which received several deadline extensions for paying the concession fee (R$933 million).

Two main factors caused the payment delays: a drop in the demand due an extended period of economic crisis in Brazil and as well as BNDES denying a bank loan to one of the consortium members (Odebrecht) which was under investigation for corruption charges at the time (InfraAsia, 2017). Other cases of early renegotiation included the airport of Viracopos – the concessionaire paid the concession grant (R$188 million) in 2016 while also receiving R$209 million in compensation from ANAC after contract amendments; and the airport of Guarulhos where the concessionaire also received R$113.84 million in compensation from ANAC in the same year (InfraAsia, 2017).

At the time of this writing, a third round of airport concessions was set to be auctioned under the PPI in March 2017: Florianópolis (FLN), Fortaleza (FOR), Porto Alegre (POA) and Salvador (SSA). These projects were also developed after a request for proposals in 2015, and main investments include building or expanding passenger terminals, as well as runway expansion in some cases (Ministry of Finance, 2015: 7). BNDES limited its funding to up to 40% of the project value using long-term loans with subsidized interest rates (TJLP plus 1.5% a.a.); additionally, the bank may acquire up to 50% of the infrastructure

debentures issued by the special purpose vehicle.[67] In the new airport concession model Infraero was supposed to have a more passive role in monitoring the transfer of operations to the new concessionaire (ANAC, 2016).

Figure 18: Map of airport concessions: first round (dark), second round (purple) and expected third round (green)

Source: adapted from Ministry of Finance (2015).

Regulatory issues

Ownership and divestiture

Until the 1980s, airports have been traditionally owned and managed by the public sector. Since then, a wave of privatization and concessions gained traction (Steer Davies Gleave, 2014: ii). A few countries still maintained a public airport infrastructure e.g. US, Canada, France, India, UAE) (Steer Davies Gleave, 2014, p. iii), while others fully privatized their airports (e.g. UK, Denmark, Austria, Switzerland, Belgium, New Zealand) or delegated the operation and management to private operators (e.g. Australia, Argentina, Costa Rica, Greece, Brazil) (Credit Suisse, 2013: 47–48). Overall only 15% of airports globally

[67] See BNDES' webpage: 'Leilões de infraestrutura aeroportuária – Salvador, Florianópolis, Porto Alegre e Fortaleza', <http://www.bndes.gov.br/wps/portal/site/home/financiamento/produto/leiloes-infraestrutura/leiloes-infraestrutura-aeroportuaria/>

were fully privatized, although these account for the largest amount of passenger traffic; 18% were public-private partnerships and 67% were public (Steer Davies Gleave, 2014: iv).

Strategies for divestiture of airport infrastructure also varied, with countries such as the UK which privatized the British Airport Authority as whole in 1987, and other countries privatizing individual airports or portfolios of airports (Steer Davies Gleave, 2014: v). Brazil maintained public ownership of the overall airport infrastructure, handing over only the operation and management of individual airports to private operators. There was no restriction to the participation of foreign companies in concessions and ground handling. However there was a curb on foreign airlines operating in the Brazilian market which allowed at most 20% of ownership by foreign partners (although there was an ongoing discussion on whether this share should be increased to 49% (Steer Davies Gleave, 2014: 43).

New commissioning ('greenfield sites')

The airport of Natal, which was initially designed as a trial concession for future rounds of concessions, was the only 'greenfield' concession to the private sector after 2003. It included a three-year construction period and an additional 25 years for operating the airport. Although airports were reaching high levels of saturation, new projects were focussed mainly on expanding the existing infrastructures instead of commissioning completely new sites (Steer Davies Gleave, 2014, p. 41).

Concession and franchise

Airports in the first and the second round of concessions were given to the bidder offering the government the highest concession fee (the criterion was expected to be applied again in the upcoming third round of concessions). This led to excessive bid values in absolute (up to R$19 billion alone in the case of Galeão Airport) and relative terms (up to 6.7 times of the minimum expected bid value put forward by the government in the case of Brasilia Airport). While this was initially perceived as success, this overall development is likely to have had a negative impact on competition as it disincentivized concessionaires to meet payment deadlines and increased the likelihood of further renegotiations.

Table 24: Concession auction values

Airport	Year	Minimum	Amount paid	Amount in €	% above the minimum
São Gonçalo do Amarante	2011	R$ 51,700,000	R$ 170,000,000	€73,835,998	228.8%
Brasília	2012	R$ 582,000,000	R$ 4,501,000,000	€1,976,637,105	673.4%
Campinas	2012	R$ 1,471,000,000	R$ 3,821,000,000	€1,678,011,637	159.8%
Guarulhos	2012	R$ 3,424,000,000	R$ 16,213,000,000	€7,120,021,636	373.5%
Galeão	2013	R$ 4,828,026,000	R$ 19,000,000,000	€5,833,231,800	293.5%
Confins	2013	R$ 1,096,372,000	R$ 1,800,000,000	€552,621,960	64.2%

Source: Steer Davies Gleave (2016: 42)

The general design of airport concessions included a first phase of transferring operations to the new concessionaire, a second phase of infrastructure investment and a final phase in which airport operations would be returned to the public sector at the end of the concession contract. The second round of concessions included increased requirements for handling a minimum amount of passengers. Thereby, Brazilian airport operators were required to partner with foreign companies in order to be able to win a concession bid. This explained a clear difference in terms of ownership patterns between the first and the second round concessions. Groups entered partnerships with Brazilian companies during the last concession round such as Singapore's Changi (with Odebrecht), Swiss Flughafen Zürich and German Munich Airport (with CCR Group) (Steer Davies Gleave, 2014: 41).

Operations and management

For airports under concession, operation and management tended to focus on using commercial opportunities to increase revenue, for example when the airport infrastructure could be used to sell other goods and services (Steer Davies Gleave, 2014: 31). Concessionaires tend to demand a monopoly on operating the airport, and the level of competition for a particular airport concession depends on the location and the level of regulation (Roumboutsos and Pantelias, 2015: 189). In most cases, aeronautical revenues are regulated leaving commercial revenues unregulated (dual till) or both aeronautical and commercial revenues are regulated (single till); the first scenario is preferred by concessionaires when aeronautical revenues are sufficient to cover the costs of operating the airport (Steer Davies Gleave, 2014: 31).

In Brazil, Infraero was, as a public entity, responsible for managing all public airports including aeronautical and commercial revenues (Steer Davies Gleave, 2014: 36). In the first and second round of concessions in 2012 and 2013, Infraero maintained control of 49% of the airport operation. In the forthcoming third round of concessions Infraero was expected to have a very reduced role focused on monitoring the transfer of operations to the new concessionaire.

Table 25: Regulatory issues in the air transportation sector

Regulatory issue	Specific issue per sector
Ownership and divestiture	• Government maintained ownership of airport infrastructure, handing over only the operation and management to the private sector. • No restrictions for foreign companies when it comes to airport management, operation and ground handling. • However foreign companies can currently only own up to 20% of registered airlines (an increase of this share is currently under discussion).
New commissioning ('greenfield sites')	• New projects focus mainly on expanding capacity of existing airports • The airport of Natal is currently the only greenfield project via a concession at federal level after 2003–2004

Concession and franchises	• In the past main award criterion in concession auctions was highest concession fee offered to the government; this attracted extremely high bid values in both absolute and relative terms, but this could have been detrimental for competition, provide incentives for adverse selection, constrained concessionaires to meet payment deadlines and incentivized renegotiations. • More restrictive bidding criteria in second round concessions forced Brazilian companies to build partnership with large global operators, limiting the number of possible participants to 13.
Operations and management	• Infraero as a public entity is responsible for the management of mostly federal airports. • In the first two rounds of concessions, Infraero maintained a 49% ownership share of each company operating and managing the airport. In the third round concessions Infraero is expected to have a more passive role of only monitoring the transition phase.

Regulatory challenges

Commitment challenge

A high number of requests for renegotiating the terms of particular concessions occurred across existing airport concessions in Brazil. This gave rise to criticism that bidding processed had been gamed – leading to an adverse selection of a bidder that is most prone to demand renegotiations, instead of selecting the most competent and efficient provider (Guasch, 2005: 2). The government made adjustments of concession contracts in the last round of auctions and included clear stipulations that attributed demand risks to the concessionaires. However, this did not prevent claims for adjustments of fee payments after decreases in demand occurred over time.[68]

Control challenge

The regulatory framework for the Brazilian airport and aviation sector underwent many changes in the last 20 to 30 years. This involved the reduced role of the Ministry of Defence and Air Force in the control of civil aviation. Key government bodies emerged, such as ANAC as the main regulator responsible for civil aviation regulation and safety oversight. ANAC grew out of the Air Force's Civil Aviation Department (DAC) which was the former civil aviation authority linked to the Ministry of Defence (Savaris et al., 2013: 40). The Secretariat of Civil Aviation (SAC) which coordinated all sectoral bodies and other civil aviation entities had previously been linked to the Ministry of Defence, later to the Chief of Staff (Minister in the Civil House) and finally was located at the Ministry of Transport. The complexity of the institutional structure arguably influenced concession oversight and monitoring.

[68] Information from interview conducted on 9 January 2016.

Uncertainty challenge

Transformation in demand over time due to economic developments and changes in the wider industry represent the main uncertainty challenge (Savaris et al., 2013: 41–42). Technological change and market liberalization suggested the strong demand growth (around 15% per year) was driven mainly by an increased presence of new entrants (GOL, Azul-Trip), while increased supply in cheaper airline tickets resulted in limited returns (Savaris et al., 2013: 41–42). However, the increase in demand for air transportation was not met with matching airport capacity expansion through public investments. Levels of public execution of investments represented only about 60% of the approved budget (Savaris et al., 2013: 41–42). However, the challenges remain considerable. For example, SAC predicted that domestic demand would triple within the next two decades and that therefore investment into infrastructure were overdue (export.gov, 2016b).

Table 26: Regulatory challenges in the air transportation sector

Regulatory challenge	Specific issue per sector
Commitment challenge	• Given high level of renegotiations, auction and concession design could have undermined levels of competitiveness, incentivize adverse selection of bidders, and decrease likelihood of concessionaires meeting payment deadlines.
Control challenge	• Regulatory framework for the Brazilian airport and aviation sector underwent many changes in the last 20 to 30 years. • Complexity of the institutional structures could have led to a decrease in efficient concession oversight and monitoring, given in particular the high rate of renegotiations. • Recent changes to the role of Infraero for its involvement in private concessions could affect oversight capabilities of activities on the ground; role of ANAC to be further defined in light of recent changes; • Multiple actors have a role in project selection and partly even design (Ministry of Transport, SAC, PPI); this could affect efficiency of decision-making process.
Uncertainty challenge	• Changes in demand due to economic development and wider industry liberalization and technological change. • Increase in demand for air transportation was not met with matching airport capacity expansion through public investments. • High uncertainty on whether enough private investment can be mobilized to ensure that domestic segment triples in size within the next 20 years in order to meet levels of demand.

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