



**DIMAS DE CASTRO
E SILVA NETO**

**CONTRIBUTOS PARA OS PROCESSOS DE
GOVERNANÇA E RENEGOCIAÇÃO DAS
PARCERIAS PÚBLICO-PRIVADAS NO BRASIL**

**CONTRIBUTIONS TO THE GOVERNANCE AND
RENEGOTIATION PROCESSES OF
PUBLIC-PRIVATE PARTNERSHIPS IN BRAZIL**



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GOVERNANÇA E RENEGOCIAÇÃO DAS
PPPS BRASILEIRAS**

Tese apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Doutor em Engenharia Civil, realizada sob a orientação do Doutor Carlos Paulo Oliveira da Silva Cruz, Professor Auxiliar do Departamento de Engenharia Civil, Arquitetura e Georecursos do Instituto Superior Técnico da Universidade de Lisboa e coorientação da Doutora Maria Fernanda da Silva Rodrigues, Professora Auxiliar do Departamento de Engenharia Civil da Universidade de Aveiro e do Doutor Paulo António dos Santos Silva, Professor Auxiliar do Departamento de Ciências Sociais, Políticas e do Território da Universidade de Aveiro.

Este trabalho teve apoio financeiro da Fundação Cearense de Apoio ao Desenvolvimento Científico e Tecnológico – FUNCAP/SECITECE, Brasil, através da bolsa de doutoramento do PROGRAMA DE BOLSAS DE DOUTORADO FORA DO ESTADO – EDITAL No. 07/2015.



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E SILVA NETO**

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PARTNERSHIPS IN BRAZIL**

This thesis is submitted to the University of Aveiro to fulfil the necessary requirements for the degree of Doctor of Philosophy in Civil Engineering, performed under the scientific supervision of Carlos Paulo Oliveira da Silva Cruz, Assistant Professor of the Department of Civil Engineering, Architecture and Georesources at the Instituto Superior Técnico of the University of Lisbon, and the co-supervisions of Maria Fernanda da Silva Rodrigues, Assistant Professor of the Department of Civil Engineering at the University of Aveiro, and Paulo António dos Santos Silva, Assistant Professor of the Department of Social, Political and Territorial Sciences at the University of Aveiro.

This work was funded by Fundação Cearense de Apoio ao Desenvolvimento Científico e Tecnológico - FUNCAP / SECITECE, Brazil, through the doctoral scholarship of the PROGRAMA DE BOLSAS DE DOUTORADO FORA DO ESTADO – EDITAL No. 07/2015.

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agradecimentos / acknowledgements

Throughout this challenging and enriching journey many were the people who, in many ways, gave me support and encouragement. First of all, my thanks to Professors Humberto Varum (Faculty of Engineering of the University of Porto) and Miguel Branco (Univeristy Fernando Pessoa), who together with Professor Paulo Silva, were the first supervisors of this work. To these, my great thanks for the attention in the early stages of the research, which with generosity and readiness contributed to structure the embryo of this thesis. I thank all my colleagues, professors, workers, PhD students and researchers from the Civil Engineering Departments of the University of Aveiro and the Superior Technical Institute of the University of Lisbon - UL, for the support and camaraderie. My gratitude also to the colleagues of the Science and Technology Center, the Civil Engineering Course and the Superior Administration of the Federal University of Cariri, namely Professors Fernando Silva (now a professor at the Federal University of Ceará), Ary Ferreira, Jeová Torres and the Magnificent Rector Ricardo Ness for always help and assist me in the accomplishment of this journey. I would also like to thank Professor Joaquim Sarmento (Institute of Economics and Management of the UL) for his valuable academic contribution in the theme of renegotiations. I also thank the Secretaries of the Brazilian State Governments and their staff, who kindly analysed and answered the questionnaires sent by me, so useful and that gave robustness to this thesis. I want to thank gratly the new supervisor and co-supervisor, Professors Carlos Oliveira Cruz and Fernanda Rodrigues, who very kindly accepted the invitation to guide this PhD and effectively dedicated a lot of time, knowledge and patience, without which this thesis would not be possible. By the fellowship and friendship of all these, I am very grateful and indebted for ever and ever. Finally, I dedicate this work to my parents and sisters, to whom I owe everything I am. To my friends, old and new, especially Emerson Araújo, Pedro Jorge de Castro, Margarete, Lucimar, Eulália Pontes, Rui Costa, Thiago Silva and Regina Modolo, who have helped me so much in this crossing. My girlfriend Caroline Câmara, great motivator and companion of all hours. My daughter Maria Alice, for the sacrifice caused by my absence during this period, compensated by my unconditional love and by the belief that children are inspired by their parents' example.

palavras-chave

Parcerias Público-Privadas, Desenho de Contratos, Governança, Renegociação.

resumo

Proposta: O acelerado desenvolvimento económico registado nas economias emergentes, como o Brasil, vem colocar nos últimos anos uma pressão acrescida no desenvolvimento de infraestruturas com impactos relevantes ao nível das necessidades de financiamento. A Parceria Público-Privada (PPP) é um instrumento, utilizado mundialmente, para contratação pública de projetos de grande porte. Sua utilização se dá pela concessão de obra ou serviço público a um parceiro privado, por um determinado período de tempo, incluindo significativo financiamento do privado. As PPPs são vistas como aceleradoras do desenvolvimento, pois se caracterizam como uma maneira rápida de aprovar e executar projetos de infraestrutura. No entanto, na América Latina e mais especificamente no Brasil, as experiências recentes resultaram num grande número de renegociações contratuais que transformam os benefícios sociais e económicos, esperados por parte dos setores público e privado, em prejuízos de ordem financeira e atrasos na entrega e operação destas infraestruturas.

O objetivo deste trabalho é revisar a literatura sobre o tema das PPPs, com o foco nas áreas de governança e renegociações, e assim analisar e comparar com as experiências das PPPs brasileiras, apontando debilidades e sugerindo melhoramentos nestes processos que resultem em ganhos de qualidade em sua aplicação.

O **método** utilizado para o desenvolvimento desta pesquisa será: o descritivo, conduzido através de revisão bibliográfica de carácter exploratório buscando um maior conhecimento sobre o assunto em estudo, seguido de estudos de caso, análise dos resultados e a proposição de melhoramentos nestes processos.

Resultados: A investigação apresenta contributos nos processos de governança e renegociação das PPPs Brasileiras que resultem em ganhos de qualidade, aplicabilidade e viabilidade na aplicação desta modalidade de contrato.

Conclusão: A investigação obteve um conjunto de contributos nos processos de governança e renegociação de contratos, que auxiliam os setores público e privado na otimização dos resultados económicos e financeiros nas PPPs Brasileiras.

keywords

Public-Private Partnership, Contract Design, Governance, Renegotiation.

abstract

Proposal: The rapid economic development registered in emerging economies, such as Brazil, have in recent years placed increased pressure on infrastructure development with significant impacts in terms of financing needs. The Public-Private Partnership (PPP) is an instrument, used worldwide, for public procurement of major projects. Its use occurs through concession projects or public service to a private partner, for a specified period of time, including significant funding from the private. PPPs are seen as accelerators of development, since they are characterized as a quick way to approve and implement infrastructure projects. However, in Latin America and more specifically in Brazil, recent experiences have resulted in a large number of contractual renegotiations that transform the expected social and economic benefits of the public and private sectors into financial losses and delays in delivery and operation of these infrastructures.

The objective of this study is to review the literature on the subject of PPPs, with the focus on the areas of governance and renegotiations, and thus to analyze and compare with the experiences of Brazilian PPPs, pointing weaknesses and suggesting improvements in these processes that would result in quality gains in its application.

The method used for the development of this research are: the descriptive, conducted through exploratory literature review seeking a better understanding of the subject under study, followed by case studies, analysis of results and proposing improvements in these processes.

Results: The research presents contributions in the processes of governance and renegotiation of Brazilian PPPs resulting in gains of quality, applicability and feasibility in applying this type of contract.

Conclusion: The research obtained a set of contributions in the processes of governance and renegotiation of contracts, to assist the public and private sectors in the optimization of economic and financial results in the Brazilian PPPs.

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Acronyms

AC	State of Acre
ANAC	Agência Nacional de Aviação Civil
AL	State of Alagoas
AP	State of Amapá
AM	State of Amazônia
ASCE	American Society of Civil Engineers
BA	State of Bahia
CE	State of Ceará
CITTA	Centro de Investigação do Território Transportes e Ambiente
CM	Contract Management
CP	Contract Performance
CPPP	Coordenação de Parcerias Público-Privadas
DF	Brazilian Federal District
ECGI	European Corporate Governance Institute
EOI	Procedure for expression of interest
ES	State of Espírito Santo
GO	State of Goiás
GPD	Gross Domestic Product
GPPPP	Gerência do Programa de Parcerias Público-Privadas
FEUP	Faculdade de Engenharia da Universidade do Porto
FIFA	International Federation of Association Football
IBGE	Instituto Brasileiro de Geografia e Estatística
IPP	Investment Partnerships Program
ISI	Web of Science
MG	State of Minas Gerais
MP	Ministério do Planejamento, Desenvolvimento e Gestão
MS	State of Mato Grosso do Sul
MT	State of Mato Grosso
PFI	Project Finance Initiative
PA	State of Pará

PE	State of Pernambuco
PI	State of Piauí
PI	Performance Indicators
PPIAF	Public-Private Infrastructure Advisory Facility
PPP	Public-Private Partnership
PR	State of Paraná
PSC	Public Sector Comparator
PSDB	Partido da Social Democracia Brasileira
PT	Partido dos Trabalhadores
P3	Public-Private Partnership
p ³	Public-Private Partnership
RJ	State of Rio de Janeiro
RN	State of Rio Grande do Norte
RS	State of Rio Grande do Sul
RO	State of Rondônia
RR	State of Roraima
SC	State of Santa Catarina
SE	State of Sergipe
SEAD	Secretaria de Administração
SEDEME	Secretaria de Desenvolvimento Econômico, Mineração e Energia
SEDES	Secretaria de Estado de Desenvolvimento
SEDEIS	Secretaria de Desenvolvimento Econômico Energia Ind. e Serviços
SEFAZ	Secretaria da Fazenda do Estado da Bahia
SEGOV	Secretaria de Governo
SEPLAG	Secretaria de Estado do Planejamento, Gestão e Patrimônio
SEPLAN	Secretaria de Planejamento
SEPOG	Secretaria do Planejamento e Gestão
SP	State of São Paulo
SUPARC	Superintendência de Parcerias e Concessões
TO	State of Tocantins
UK	United Kingdom
URL	Uniform Resource Locator
UPPP	Unidade de Parcerias Público-Privadas

USA	United States of America
USP	Unsolicited proposal
VFM	Value For Money

Chapter 1. Introduction

1.1 Preliminary remarks

1.1.1 The need of infrastructure in developing countries

The rapid economic development of Brazil in recent years demand costly infrastructure investments. Brazil, as well as others developing countries, needs many of these projects and demand solutions to make them feasible. The Public-Private Partnership (PPP) is a tool used worldwide to enable large projects. Its use occurs through delegation of the public goods or services to the private sector. In Brazil, the insufficient existent infrastructure has limited the volume of private investment and slowing the nation's economic growth, compared to other emerging countries such as China and India (see Figure 1). The PPPs in this context are presented as an option in solving this problem (Frischtak, 2008).

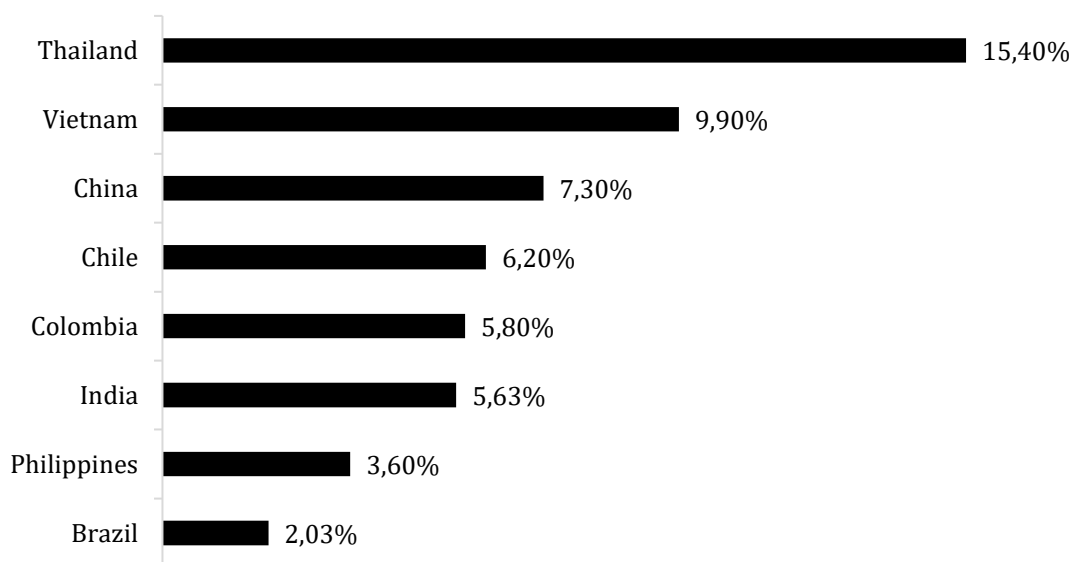


Figure 1. Infrastructure investment as percentage of GDP

Source: Adapted from Frischtak (2008)

PPPs are viewed as accelerators of development, since they are characterized as a quick way to approve and implement infrastructure projects. Currently, Brazil has started the implementation of this form of contract, demonstrating their interest through the implementation of PPP programs in the three spheres: municipal, state and federal. According to Radar PPP (2016), there were 86 PPPs contracts signed in Brazil: one is

under federal jurisdiction, 48 under state jurisdiction and 37 developed by municipalities.

1.1.2 Lack of infrastructure in Brazil: barriers to the growth

Designed as an alternative to financial inability of governments to invest in infrastructure, PPPs have been regulated nationwide for 15 years, by Federal Law no. 11,079/04 (President of the Republic of Brazil, 2004). Before that, some Brazilian states, such as Minas Gerais and São Paulo, had already published their own laws establishing the state programs of PPP. São Paulo's metro yellow line number 4 was the first Brazilian project applying PPP, followed by the state of Minas Gerais with the PPP of MG-050 highway and the state of Bahia with the project of the outfall sewer. Since then, all states, and some wealthier cities, have invested in the idea of PPPs contracts for the development of their infrastructures and economies (Radar PPP, 2016).

Beyond these infrastructure demands for the growth of investments in the industry, there is a growing interest of private companies and public sector in forming partnerships that will meet the developing countries demands of infrastructure, such large projects. In the Brazilian case, as example, the WORLD CUP 2014 and the 2016 Olympic Games were recently among the major PPP challenges of civil engineering and financial arrangements.

1.1.3 Disadvantages of the PPPs: learning with the mistakes

PPPs have been devised to serve the public's interest in providing infrastructure to improve the quality of life of the citizen and the progress of the nation. In spite of that, public power has not always been able to extract from these PPPs the social and economic benefits simultaneously. In seeking a solution to this, establish and strengthen PPP units are essential in order to help both public and private sector to develop and successfully implement PPP projects (Dutz et al. 2006, Istrate and Puentes, 2011). Brazil, as a developing country, has its budget constrained and cannot afford to

have losses from poorly managed contracts that result in financially disadvantageous renegotiations.

1.2 Objectives

The main objective of the thesis is to review the literature on the subject of PPPs, with the focus on the areas of governance and renegotiations, and thus to analyse and compare with the experiences of Brazilian PPPs, pointing weaknesses and suggesting improvements in these processes that would result in quality gains in its application. Narrowing down, it is possible to disaggregate in several smaller objectives:

- Identify the gaps of PPP management by literature research available on the Web of Knowledge, and examine the academy's interest in the subject of PPPs; the most searched infrastructure sectors; the most studied subjects within the theme of PPPs;
- Analyse the Brazilian state PPP units and programs' development, identifying the challenges in the governance of PPPs in Brazil, looking at three main dimensions of governance model, PPP infrastructure growth and PPP contract management, pointing out the most fragile areas and proposing mitigation strategies;
- Identify the patterns of PPP renegotiations for infrastructure projects in Brazil, the recurring problems of contract renegotiation, who caused, when and the reasons why it occurs to suggest improvements on the processes, increasing the chances of successful PPPs;
- Understand, from the previous experience in Latin America, the main drivers for Brazilian PPPs renegotiation, what are the main determinants and consequences, in order to improve institutional and regulatory framework, decreasing the likelihood of renegotiation.

1.3 Research Questions

In order to achieve the above-mentioned objectives, some targeted research questions were developed:

- Where are the literature gaps? There is growing interest in the subject? Where and who has developed the publications on these issues? What are the most searched infrastructure sectors? What are the more covered research areas and research topics?
- Who are the state Brazilian PPP Units? How these PPP Units are organized and what the main results they have been? What are the main obstacles of PPPs in Brazil? What are the main challenges? What are the solutions and general recommendations to overcome these obstacles?
- What are the main determinants and motives of Brazilian PPP renegotiations? Who were responsible for triggering the renegotiation? What are the implications involving renegotiations by electoral cycle and political party?
- How to improve the Brazilian PPP programs, to reduce and minimize the likelihood and unwanted consequences of renegotiation?

1.4 Methodological structure

The current thesis is organized into two parts, with different methodological structures. In the initial part, an overview of PPP and Project Finance Initiative (PFI) academic researches is investigated and depicted as the thesis background for the accomplishment of the research that will be developed in the next chapters. In the following part, the contributions to improve the PPPs governance and renegotiation processes will be pointed out.

In a close view, the initial part consists on an exhaustive research of existing literature, examining more than 600 papers published in Web of Knowledge journals, between 1991 and 2014. It was performed a bibliometric analysis, focusing on the fields covered

by the papers, the main authors, countries, or sectors, among other types of information.

The contributions part focused on the Brazilian PPP experience, to improve the program, in two main areas: governance and renegotiations of contracts. The focus on these two areas arises from a crosscheck analysis between the main critical questions identified in Part I, the identification of literature gaps, and the considerable evidence regarding the difficulty encountered from public and private sectors to create robust contracts that reduce renegotiation events, thus achieving the initially wished projects' results. In each area the approach consisted in using real data, developing schemes to analyse and compare the data to propose improvements in these processes.

The methods adopted in each chapter, were selected according to the specificity of the questions to be answered, and each methodology will be detailed and explained further. In these two areas, it is believed that substantial contributions to the Brazilian PPP experience have been made.

1.5 General Organization

The proposed methodology resulted in the following organization of the thesis, as illustrated in Figure 2.

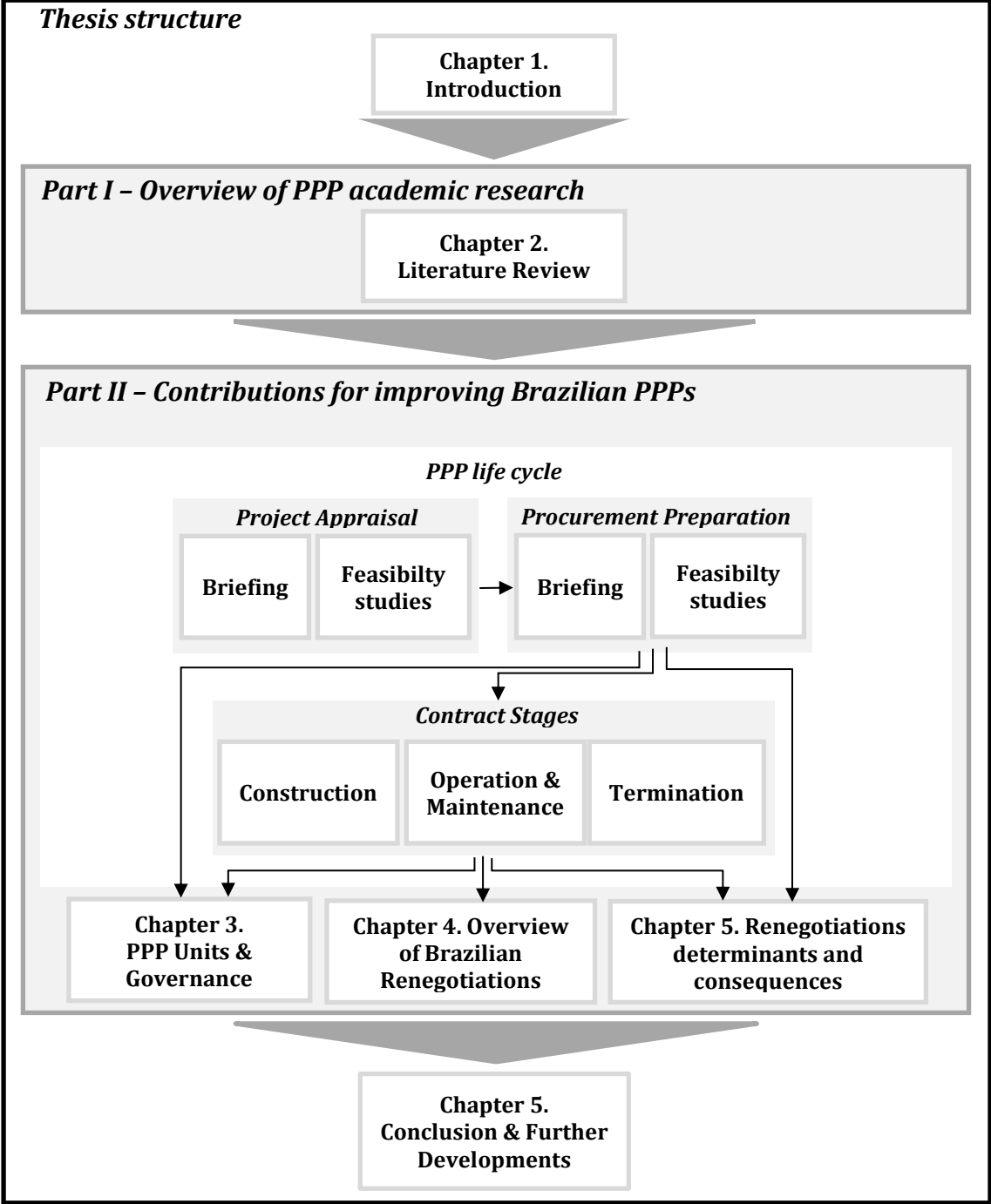


Figure 2. Thesis structure

Chapter 2.

PPP Projects: Literature Review

2.1 Introduction¹

PPPs are a procurement model used to deliver public infrastructure and/or services, typically in the sectors of transport, energy, environment, health, security or education. The economic rationale of the PPP model is that when exposed to risk, or with the probability of losses, the private sector can achieve a higher level of efficiency, thus increasing the value for money of the projects (Bennett and Iossa, 2006; and Meda, 2007). PPP development is built upon the possibility of achieving higher efficiency gains and the access to private capital in a context of public funding shortage, providing an alternative for Governments to develop their infrastructure development plans. But these potential upsides are not “free of charge”. There are many costs, or pitfalls, the most relevant being the vulnerability to uncertainty of long-term contracts, often renegotiated, with severe impacts on the public sector and/or directly on users (e.g. increase in fares, decreases in the level of quality of the service, etc.) (Hart, 1988; Guasch, 2004).

PPP have been mentioned in the literature with different acronyms, as example: PPP, PFI, P3 or P³. The most popular, and worldwide used, is PPP, although PFI was the very first term adopted by British government and the term used in the first published paper addressing the subject in 1950, question the role of private financing in hospitals (Mignon, 1950). Since then, according to the *Web of Science* database, less than 70 papers were published until 1991. Is particularly after 2000 that the literature on PPPs has expanded significantly, with a stronger growth rhythm over the last 5 years. The theory has followed the practice in the case of PPPs, considering that it was in the late 1980's and early 1990's that the model became more used.

This chapter intends to provide a unique overview of the evolution and trends of PPP papers in the academia. This type of analysis is highly conditioned by the database used (existing data bases, simple search over the web, etc.), and it was adopted a well-established repository – Web of Science – to decrease the discretionary of the search. Historically, there have been papers addressing literature reviews on PPPs although

¹ The content of this chapter was published in the paper “Bibliometric analysis of PPP/PFI literature: overview of 25 years of research”, *Journal of Construction and Management ASCE's journal* 142(10).

with limit focus (sample), areas and industries, or type of analysis. A summary of these papers is presented in Table 1.

This bibliometric analysis has identified all publications in the Web of Science on PPP and PFI, in a total of more than 600 papers, in more than 300 high quality journals, since 1990. This provides the largest database ever used. The papers were analysed and classified in 14 topics, almost the double of the size of the widest previous researchs attempt of previous papers.

Table 1. Summary of recent PPP literature reviews

Literature review	Al-Sharif and Kaka (2004)	Weihe's (2008)	Kwak et al. (2009)	Ke et al. (2009)	Tang et al. (2010)	Papajohn et al. (2011)	Marsilio et al. (2011)	Andon (2012)	Garvin and Gross (2012)	Chen et al. (2015)	Current research
Number of journals analysed	4	-	-	7	6	-	-	≥ 25 Google Scholar	140	-	310
Number of papers	34	-	-	170	107	-	298	97	278	95	575
Period of analysis	1998-2003	-	-	1998-2008	1998-2007	-	2008	2010	1997-2010	2002-2014	1991-2014
Research categories	3	4 (approaches)	-	7	-	-	-	-	8	5	14
Type of research	No bibliometric	No bibliometric	No bibliometric	No bibliometric	No bibliometric	Questionnaire	Bibliometric analyses *	Partial bibliometric analyses**	Bibliometric analyses***	Meta-analyses	Bibliometric analyses *
Research area	Construction journals	Not specific	Not specific	Construction journals	Construction journals	Transportation	Not specific	Accounting	Transportation	Transportation	All areas
Geographical scope	Not specific	Not specific	Not specific	Not specific	Not specific	United States	Not specific	Not specific	Not specific	Not specific	All regions

Note: * ISI Web of Science (2015); ** Specific journals and Google Scholars' search samples; ***Google Scholars.

2.2 Methodology and data

The first step of the research was to define which of the existing scientific repository to use. Previous works, such as Al-Sharif and Kaka (2004), Ke et al. (2009) and Tang et al. (2010) have elected a sample of specific journals while others as Chen et al. (2015) preferred to define the sample using their work experience based on journal papers, government reports, conference papers, independent studies, dissertations and seminar discussion papers. Although there were others academic digital database available, the chosen one was the *Web of Science* database, because its comprehensiveness and scientific robustness. Although Andon (2012) and Gavin and Gross (2012) have resorted to the Google Scholars database, it was preferred to follow Marsilio et al. (2011) experience adopting the *Web of Science* database. The chosen temporal interval was from 1990 to 2014. Appendix S1 and S2 provide the list of papers for “PPP” and “PFI” respectively. The last enquiry (*Web of Science’s* webpage) was made in March 6th of 2015.

After the identification of all papers, a database was created in order to catalogue the papers information according the following criteria: date of publication, title, authors, journal of publication, research country origin, geographic scope, project sector, research area, main findings and research topics. The database analysis identified papers without basic information such as, the publications date, author’s names, researchers’ origins, research areas or even the abstract itself. The database includes a total of 626 papers. However, 51 papers were excluded because they did not met the necessary conditions to be selected and analysed, due to several reasons: papers double registration in the *Web of Science’s* webpage; papers not related with the research (papers that just mention PPP as the procurement model adopted in their searches, without cannot be related to none of the research topics analysis). After this, the final sample resulted in 575 papers, 455 for PPPs and others 120 for PFIs (see Table 2).

Table 2. Profile of the analysed publications

Profile	Number of papers	Percentage (%)
Total publications in <i>Web of Science</i> with the topics PPP and Public-Private Partnership (filter use of the term Article)	488	78
Total publications in <i>Web of Science</i> with the topics PFI and Private Finance Initiative (filter use of the term Article)	138	22
Total of papers before analysis	626	100
Papers excluded because their abstracts are written in other languages different from English	10	1.60
Papers excluded because do not have abstracts	14	2.24
Papers excluded because have been registered twice	06	0,96
Papers excluded because do not are related with the research area. ²	10	1.60
Papers removed from the initial list because its objectives and/or conclusions have not been clearly presented or do not exist	11	1.76
Total of papers excluded before analysis	51	8.15
Total of papers analysed in this research	575	100

2.3 Literature analysis

The literature analysis will look at the evolution of the quantity of papers, the main publishing journals, research areas, research origins (countries where the authors are affiliated), geographic scope (data or case study geographic provenience and/or location), project sector, research topics (main issue addressed based on proposed 14-categories classification) and a list of most cited papers.

² Papers that cited the expressions PPP and/or PFI, but in fact do not explore the theme. It was notice, mainly in papers that comes from medical, chemistry, telecommunications and biological areas, where they usually made reference to the terms just to point out the sort of model that had financed its projects.

2.3.1 Number of papers

The results show that, for both PPP and PFI acronyms, there is a growing number of papers as a result of an increasing attention that the academia is devoting to this subject (see Figure 3). Since 2002, the growth has been almost exponential and it is likely that it will continue over the next decade, despite the slight decrease of the number of papers verified in 2014 particularly taking into account that over the last 10 years the number of projects developed worldwide has increased substantially.

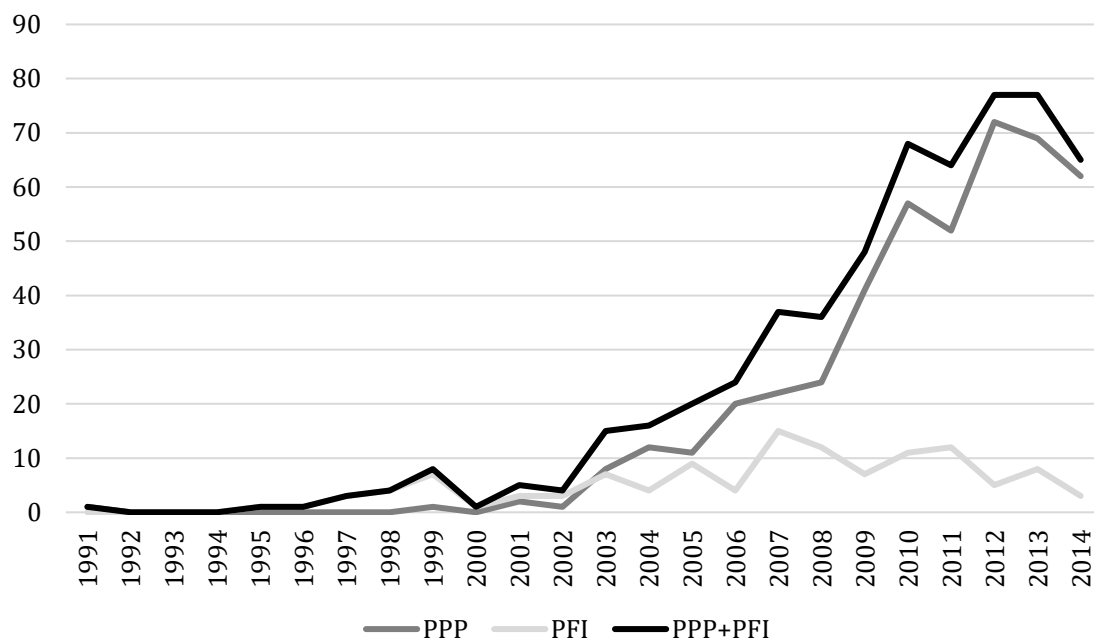


Figure 3. Number of papers per year

The number of publications with the acronym “PPP” has increased consistently, but the same does not happen with “PFI”. It would probably be the result of a more generalized use of the PPP term for British influenced authors that used PFIs acronym in the past and are progressively abandoning the term.

2.3.2 Journals

The two most relevant journals publishing about PPPs are the *Journal of Construction Engineering and Management-ASCE* that published 33 papers, and the *Public Money & Management*, with 31 papers published. Considering the list of research areas catalogued by the *Web of Science*, the journal in first place belongs to “Engineering” area and the second place journal to “Business Economics” area.

Other finding is that these 2 research areas dominate the “Top 10” journals ranking, each of them with 4 journals with the great number of publications about PPP and PFI (see Figure 4).

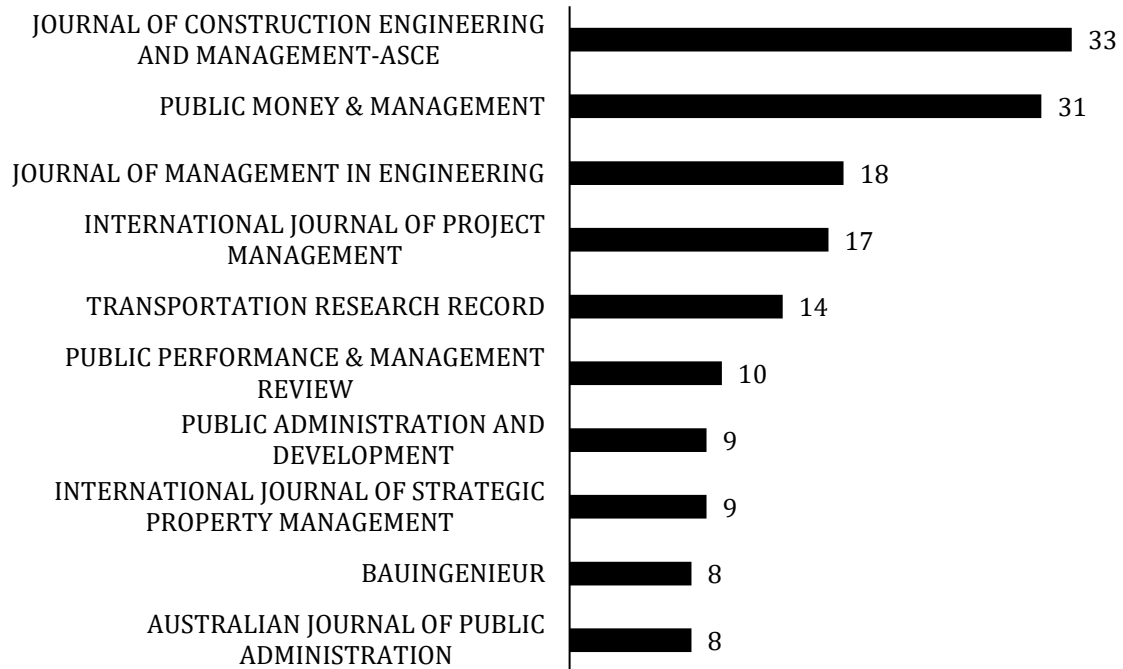


Figure 4. Ranking of top 10 journals publishing PPP and PFI papers

2.3.3 Research areas

As mentioned earlier the 2 leading areas are engineering and public administration, with 161 and 144 papers respectively. In third comes business & economics, with 120 papers. Thenceforth, the other sectors together represent a little more than 1/3 of the total of papers (see Figure 5). These outcomes evidence the multidisciplinary nature of PPP research, involving typically technical contents (engineering), public policy concerns given that they are used to develop and manage public services (public administration), but also include complex financing mechanisms and business models (business & economics).

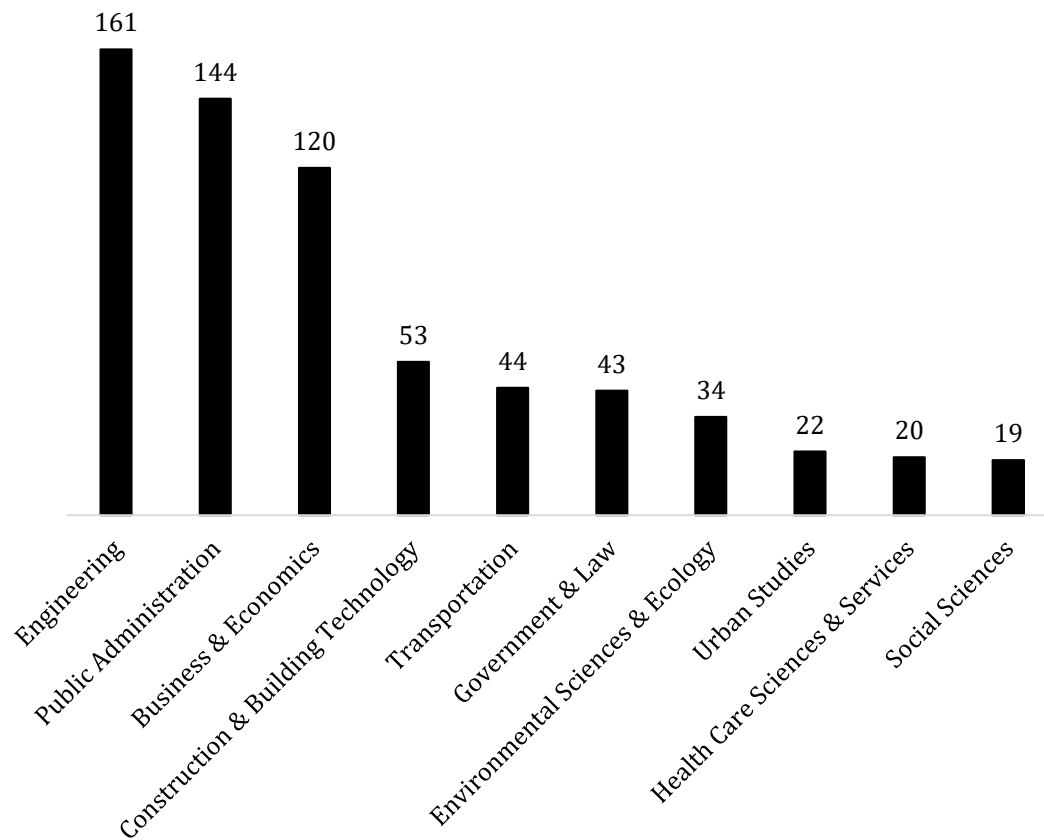


Figure 5. Number of papers in the top 10 rankings by research areas

2.3.4 Research origins

Between the 72 countries with researchers publishing about the PPPs theme, UK stands out at the top of the list with 122 papers. China appears in second place, followed by USA, with 72 and 62 papers respectively. Australia is in the fourth place, with 34 papers published, followed by Portugal, Germany, Switzerland, Italy, Spain, India, Brazil, Netherlands, Taiwan and Belgium, that published between 15 and 10 papers each one (see Figure 6).

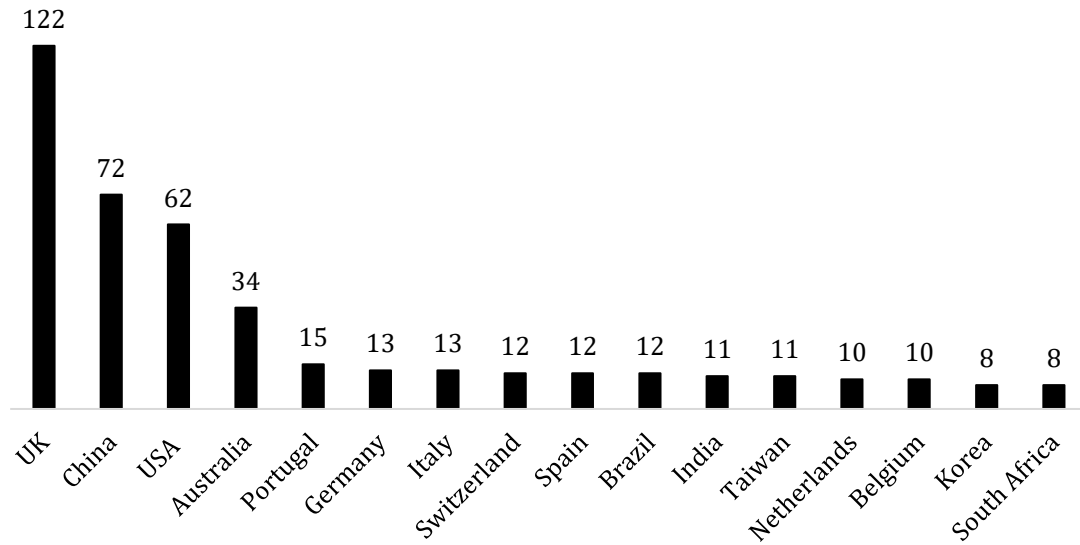


Figure 6. Number of papers per country

2.3.5 Geographic Scope

Regarding, the scope by country, the UK stands out at the top of the list with 97 papers. China appears in second place, followed by Korea, with 51 and 38 papers respectively. Here, USA was in fourth place, with 32 papers published. After this, Australia comes with 22 papers and is worth mentioning India and Brazil with 17 and 13 papers, followed by Portugal with 12 papers published (see Figure 7).

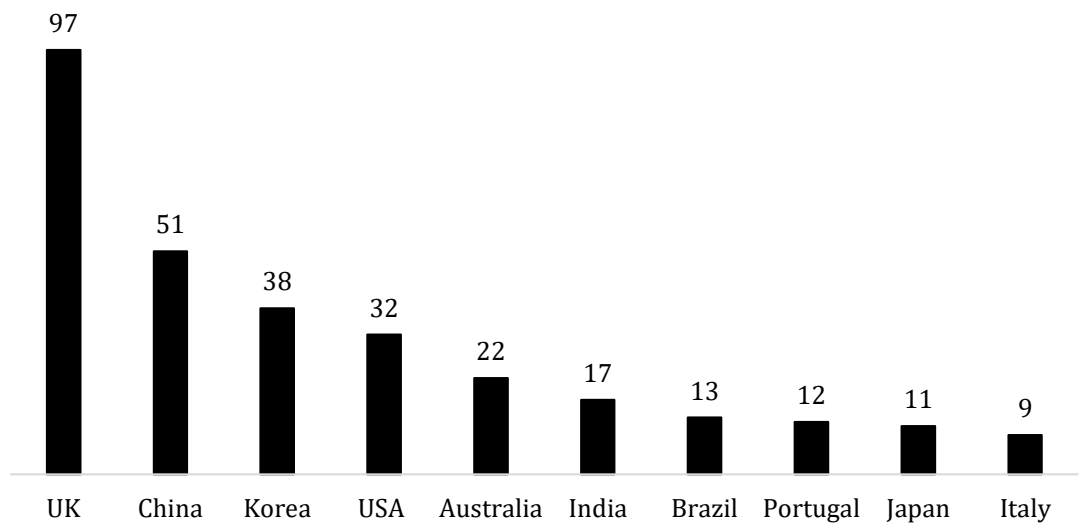


Figure 7. Number of papers by rank of countries' geographic scope

2.3.6 Project sector

In this section it is analysed what was the primary sector of the papers. The 13 sector classification selected were: Transportation, Health, Environment, Education, Housing, Energy, Agriculture, Communication, Security, Tourism, Sports, Urban regeneration and Mining. The results show that the 2 leading sectors are Transportation and Health, with 98 and 91 papers respectively.

Over the last two decades, governments have been investing significantly in roads, railways, light rails, ports airports and hospitals, which has justified the academic attention to this fields. Transport and health were also the first sectors to experience the use of PPPs. In third and fourth Environment and Education, with 52 and 25 papers respectively. Thenceforth, the other sectors together represent 1/5 of the total papers classified (see Table 3).

Table 3. Number of papers per project sectors

Projects Sector	Number of papers	RANKING
Transportation	98	1
Health	91	2
Environment	52	3
Education	25	4
Housing	15	5
Energy	11	6
Agriculture	10	7
Communication	9	8
Security	9	9
Urban Regeneration	6	10
Tourism	5	11
Sports	3	12
Mining	1	13
Not identified	249	-
TOTAL	355	-

The total of papers is lower than the full database number because some papers were not applied to a specific sector or were essentially conceptual and/or theoretical papers.

2.3.7 Research Topics

In this section the papers were classified according to a list of research topics, previously elaborated. The idea to classify the papers in topics, themes or categories, was previously used by other researchers. Al-Sharif and Kaka (2004), Weihe's (2008), Ke et al. (2009), Gavin and Gross (2012), and more recently, Chen et al. (2015) have also create their own categories and classified their samples according it. The number of categories varies from author to author, as presented in Table 4.

In this chapter it was attempted to create a list that could cover the majority of the present PPPs' themes. It was intended to create a list that would exhaustively cover the various topics of PPP/PFI, and not limit its scope to PPPs researched from the construction engineering perspective. The classification resulted in 14 research topics depicted in Table 4, based in the literature review of complemented with new groups propoused by the author of this thesis.

The 2 most popular topics are Contract Performance and Qualitative Cost & Benefits, with 135 and 115 papers respectively. In third, fourth and fifth positions are Contract Design and Risk Sharing, PPP/PFI Political or Institutional Issues and Value for Money Tests, respectively. Thenceforth, the other sectors together represent a little more than 1/5 of the total papers as shown in Table 4. The total of papers is higher than the full number of database because some papers were classified in more then one topic.

Table 4. Research topics, related description of issues, and number of papers

Research topics	Summary description	Number of papers
Contract Performance	Comparative costs, time and client requirements performance case studies; Operational performance; Success rate; Projects performance; Key performance indicators	135
Qualitative Cost & Benefits	Applicability of the model; Expected cost and benefits examination; Overall opportunities, problems, and challenges in the PPP market; PFI's attractiveness to the private sector; Projects sector's experience reviews; PFI's effectiveness of delivering government objectives; Procurement methods mechanisms comparison; Firms challenges participating in models	115
Contract Design and Risk Sharing	Risk sharing; Design contract achievement of public goals; Assessment of risk-related issues; Risk analysis; Risk factors in case studies; Procedural fairness and cooperation; Evaluation of government guarantees	95
PPP/PFI Political or Institutional Issues	Governmental strategies; Legal framework; Governmental marketing strategies; PPP regulation; Country political risk analyses	89
Value for Money Tests	PSCs past projects analyses; PSCs models; Practices of ex-ante evaluation; VFM's case studies evaluations; Feasibility studies; VFM and economic analysis; Problems of VFM analysis; VFM's projects solutions; Concession price determination	73
Stakeholder Management	Cooperative relationship; Stakeholder's engagement and compliance culture; Stakeholder's management; Stakeholder's participation and influence	41
Contract Management	Life-cycle project management; Critical management factors; Critical success factors and best practices	28
Accountability	Role and effects of accounting; Accounting issue: record information on balance sheet; Public expenditure analysis; Taxation issues	17
Financing PPP/PFIs Projects	Availability and cost of capital; Financing capacity	19
Procurement Model	Bidding process; Information management in tenders, Process improvement	13
Renegotiation and Dispute Resolution	Drives for renegotiation; Costs of renegotiation; Equilibrium models in renegotiation; Dispute Resolution	10
Literature Review	Literature Review	8
Environmental Issues	Environmental issues	5
Contract Termination	Project effect at the contract termination; Early contract termination	2
TOTAL		650

As mentioned previously in this chapter, the top 3 countries contributing to PPP research are UK, China and USA respectively. Figure 8 shows these countries number of papers per “Research Topic”. Among the topics is Contract Performance the most popular between the UK researchers with 32 papers, followed by Qualitative Cost & Benefit with 23 and Political and Institutional Issues with 19 papers. In China, Contract Design and Risk Sharing with 20, Value for Money Tests with 15 and Qualitative Cost & Benefit with 12 papers. In USA cases, Value for Money Tests with 15, Political and Institutional Issues with 12 and Qualitative Cost & Benefit with 12 papers are the most published areas.

These results also show that all 3 countries have prioritized Qualitative Cost & Benefit’s studies. The focus of the researches has been more to evaluate the costs and benefits of using PPPs, in *ex post* empirical analysis both on the results of the model in terms of deliviering expected outcomes, as in the succes in atracting private partners. The results also show that UK and USA share the preference for Political and Institutional Issues. This category preferency is shown thourght the researchers’ increasing interest in study the governmental strategies, legal framework and what the countries find relevant to consider in theirs PPPs’ regulation.

Finally, although Value for Money Tests not appears between the UK’s top 3 theme it comes in 4th with 15 papers published, that is the same number of papers published in China and USA. Researchers in these 2 countries are increasingly concerned in investigate the Public Sector Comparator (PSC) models and its past projects analyses. Value for Money (VFM) it is a popular them between these countries’ papers that sought investigate the VFM’s analysis, their problems, case studies evaluations and determined concessions prices.

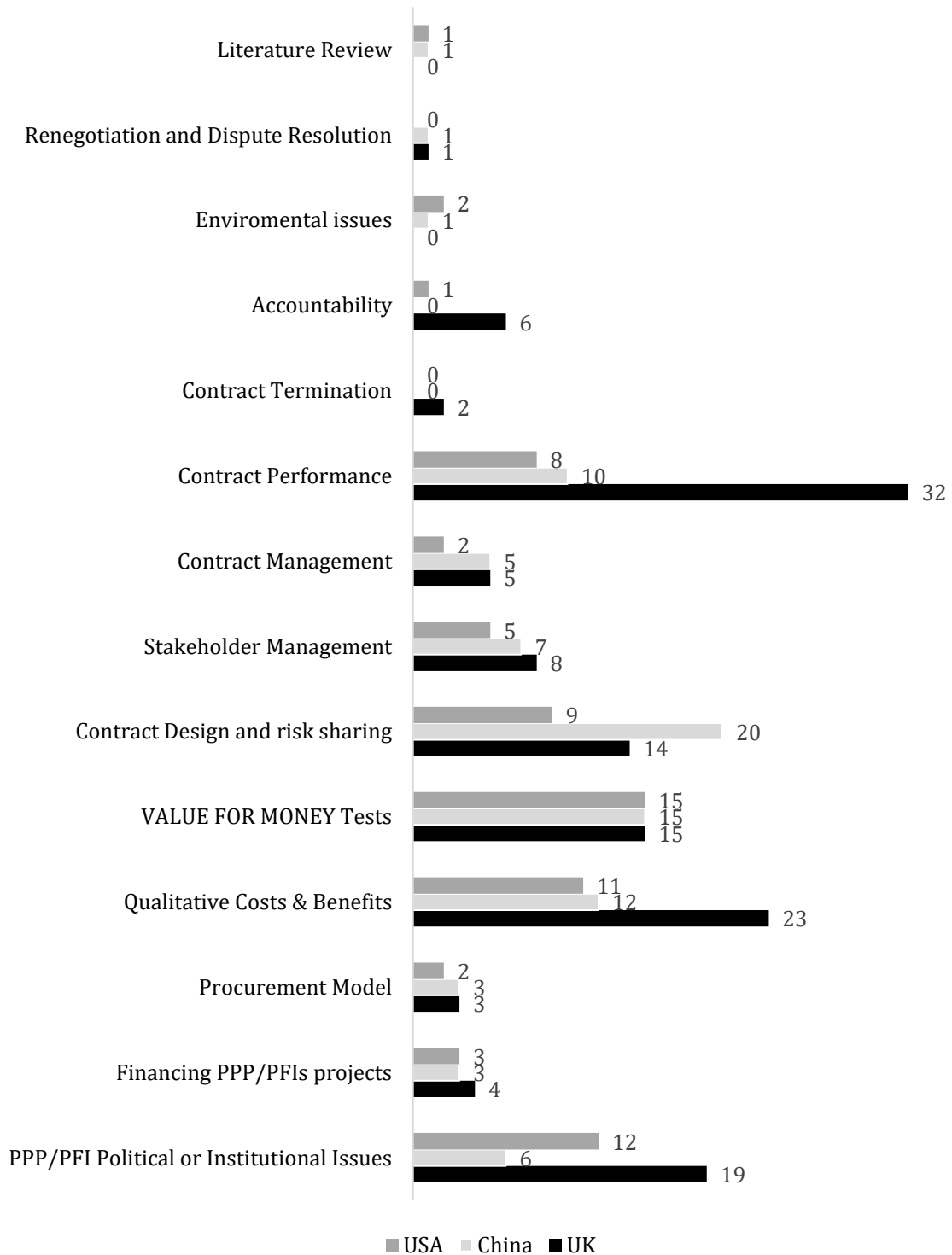


Figure 8. Number of papers per topic of United Kingdom, China and United States

2.3.8 Most cited papers

In this section, the idea was to create a list of the most cited papers for “PPP” and “PFI” in the literature and the topics of those papers. The classification resulted in 10 Top papers for each term depicted in Table 5.

Table 5. Top 10 papers in number of citations.

Ranking	Papers	Authors	Journals	Topics	Number of citations
1	Accountability of networked climate governance: the rise of transnational climate partnerships	Backstrand, K. (2008)	Global Environmental Politics	Accountability	80
2	Therapy by design: evaluating the UK hospital building program	Gesler, W; Bell, M; Curtis, S; Hubbard, P; Francis, S. (2004)	Health & Place	Stakeholder Management	77
3	Public-private partnerships: from contested concepts to prevalent practice	Bovaird, T. (2004)	International Review of Administrative Sciences	Qualitative Costs & Benefits	76
4	Critical success factors for public-private partnerships in infrastructure development	Zhang, XQ. (2005)	Journal of Construction Engineering and Management-Asce	Contract Management	70
5	Building and managing facilities for public services	Bennett, J; Iossa, E. (2006)	Journal of Public Economics	Contract Termination	58
6	The private finance initiative: risk, uncertainty and the state	Froud, J. (2003)	Accounting Organizations and Society	Contract Design and Risk Sharing	54
7	The new public service ethos: an ethical environment for governance	Brereton, M; Temple, M. (1999)	Public Administration	Stakeholder Management	49
8	The economics of the private finance initiative	Grout, PA. (1997)	Oxford Review of Economic Policy	Value For Money Tests	49
9	Preferred risk allocation in China's public-private partnership (PPP) projects	Ke, YJ.; Wang, SQ.; Chan, APC.; Lam, PTI. (2010)	International Journal of Project Management	Contract Design and risk sharing	36
10	Towards a comprehensive understanding of public private partnerships for infrastructure development	Kwak, YH.; Chih, Y.; Ibbs, CW. (2009)	California Management Review	Contract Performance	36

2.4 Research limitations of the literature review

This type of literature review is not immune to criticism and it contains some limitations regarding: the use of *Web of Science* as the search tool. Although *Web of Science* is considered the world's leading citation databases, offering high level of accuracy and detail on a multidisciplinary scale, it does not capture the entire diversity of the publications. The search criteria adopted in this chapter bibliometric analysis also identified a number of “false positives” which requisite manual analysis and some papers’ exclusion.

2.5 Partial conclusions

The objective of this chapter was to undertake a broad literature review of the PPP research. The review undertaken in this chapter uses a bibliometric analysis to select a sample of more than 600 papers from the *Web of Science*, considered the largest and most reliable source for academic publications. The database of PPP papers built is more than double the amount of the widest previous literature studies. Despite the slight decrease verified in 2014, the number of publications about PPP appears to have a tendency to growth. First, because many authors have now established PPPs as their primarily research area and second because the first generation of PPPs (early 1990s) is now reaching the end, providing valuable empirical evidence of successes and failures. Furthermore, the number of PPP projects throughout the world is increasing, with a stronger growth in developing economies, eager to access private financing and private expertise to modernize the countries’ infrastructure systems. Among the *Web of Science’s* classification, “Engineering” journals have been taking the lead in PPP research, followed by “Public Administration” and “Business & Economics”, illustrating the multidisciplinary approach to this area. In relation to the *Web of Science’s* “Research Areas” classification, it is notice that, although PPPs have been used in technical systems (engineering), there is a strong dimension of public governance and administration, and also implications from a financial/economical perspective. Other notable conclusion is that considering the papers’ “Research Origins” and

"Geographic Scope" classification, showing that the European and Asian research institutions had written almost 2/3 of the papers, which is approximately the same number of papers that had used these geographies as case studies. It would demonstrate that there is a tendency for research institutions to investigate projects on its own geographical areas. The two lists created - "Project Sectors" and "Research Topics" - contributed to highlight the sectors and topics with a higher number of papers. PPPs research has been focused on a limited set of topics, which together represent almost 80% of the publications. These topics are "Contract Performance", "Qualitative Cost & Benefits", "Contract Design & Risk Sharing", "Political or Institutional Issues" and "Value for Money Tests". The academia has been particularly sharp at contributing to the aspects of contract design, risk sharing, analyzing the contract performance and benefits, but has devoted less attention to the areas of contract termination and renegotiation. The seminal works on PPPs were also aimed at the contract design area (an extremely relevant research area *per se* in the economics field) and in empirical evaluation studies. Given that some of the main problems in the use of PPP are emerging during the project's life, the area of contract management, contract termination, renegotiation and even contract failure are very likely to grow.

It has to be highlighted that, after observing a large number of renegotiations, identified in the results of this chapter 3 (PPP Units and Renegotiations), the author realized the need to investigate these cases more deeply, in the following chapter of this thesis.

Chapter 3. PPP Units and Governance

3.1 Introduction³

There is a global need for infrastructure but Governments lack behind in raising sufficient public capital to meet their needs (Ahmed and Ali 2006, Bhattacharya et al. 2012). With the emergence of PPPs, governments were given the opportunity to use a model that would, at least in theory, be the fastest and cheaper to help build, or rebuild, their infrastructure. Unlike a traditional procurement, in which governments need to have public capital to leverage these projects, PPPs are attractive by raising private capital. In most PPP contracts, the public partner only has to start the payments once the private partner finishes the construction stage and starts operating (Istrate and Puentes 2011, Islam 2014, Boardman and Hellowell 2016).

However, governments were not prepared to manage the complexity of this challenging procurement model compromising the projects' performance (Mahalingam et al. 2011, Puentes 2012; Regan 2012, Jooste and Scott 2012, Islam 2014). Private participation relies on borrowing large sums of capital to undertake these large-scale contracts. Therefore, the private sector requires a sufficient level of trust in the public sector capacity to manage and cope with the financial, technical and administrative requirements of the project (Marques and Berg, 2011).

Much of the private sector expectation is based on the assumption that the public partner gathers all legal, managerial and financial conditions to successfully accomplish their agreements. Some governments rely on external staff from consultants and banks to guarantee proper management of the contract (Cruz and Marques 2013). Other governments decided to improve by themselves their managerial performance, public management teams, institutional framework, legislation and staff qualifications. This is usually done through PPP units. A PPP unit can be generically defined as an organization designed to promote and or improve PPPs (World Bank 2007). In addition, PPP units were developed from the need to form a group to guide policy development and manage projects implementation

³ The content of this chapter is written in the paper "PPP DEVELOPMENT AND GOVERNANCE IN LATIN AMERICA: AN ANALYSIS OF BRAZILIAN STATE PPP UNIT", submitted in the Journal of Infrastructure Systems ASCE's journal.

(Dutz et al. 2006, Sanghi et al. 2007, Istrate and Puentes 2011, Puentes 2012, Regan 2012, Islam 2014, Jooste and Scott 2012, Chou et al. 2014).

PPP units' real capacity of interference in PPPs success is directed linked with its appropriate role definition, placement in the governmental structure and political support (Dutz et al. 2006, Farrugia et al. 2008, Burger 2009, Istrate and Puentes 2011, Mahalingam et al. 2011, Islam 2014, Hurk et al. 2015, Boardman and Hellowell 2016). It is important to mention that the simple concept of success in both the analysis of PPP projects and/or PPP units is far from consensual. But for the purpose of this research, by success, in terms of PPP projects, it should be understood the "on time" and "on budget" delivery of the project as set in the tender documents. In terms of the success of the PPP unit, the definition is more blurry, but it could be stated as the ability to effectively implement, monitor and manage PPP projects, which is still a very subjective definition.

One of the objectives of this chapter is to provide a clear theoretical background and a literature review on PPP units, since the existing literature in this field is still scarce. It is also intended to identify conclusions, conflicting evidence and/or trends that impact on the PPP units in different countries, and if the PPP units are essential to PPP projects success. The first authors to address PPP units focused on investigating the role, functions, characteristics, similarities and differences of the PPP units studied (e.g. Dutz et al 2006, Sanghi et al. 2007). Some of the main findings show that successful PPP projects can be achieved with the interference of governmental PPP units. However, PPP unit's success is not just conditioned to the existence of a technically and managerial qualified staff. The second wave of authors, such as Farrugia et al. (2008), Mahalingam et al. (2011) and Hurk et al. (2015), were more interested in amplifying the discussion organizing and analyzing its PPP units' data in the aspects of governance, project experiences and program results.

The objective of this chapter is to undertake a comparative analysis of the Brazilian PPP units considering their: governance model, PPP infrastructure growth and PPP contract management. The analysis was based on publicly available information and on a questionnaire that has been sent to all Brazilian State PPP units. After this, a final sample resulted in 22 Brazilian department states' that were analysed, of a total

of 27 federative units (26 states and Brasilia, the federal capital of Brazil and seat of government of the federal district). A summary of these sample is depicted in Table 6.

This provides the very first attempt to investigate State PPP units and, at the same time, is the largest database of PPP units used so far, considering the number of dedicated units from the previous studies. The chapter is organized as follows: after this introduction a literature review identifying all major contributions in the area are presented; the third section contains an overview of the Brazilian PPP program, followed, in the fourth section, by a presentation of the methodology and data; the fifth section presents the comparative analysis, focusing on the differences and patterns among the PPP units in 27 states, and a discussion of the main research limitations; finally the conclusions and main policy implications are stated.

Table 6: Summary of Brazilian´ PPP units

State	PPP Unit's Nomination	Subordinate State Department	No web page	PPP Unit's own page	Dept.'s web page	Webpage
Acre	-	Not identified	X	-	-	-
Alagoas **	Unidade de Parcerias Público-Privado -UNIDADE DE PPP	Planning Department (Secretaria de Estado do Planejamento, Gestão e Patrimônio - SEPLAG-AL)	-	-	X	http://www.seplag.al.gov.br/planejamento-e-orcamento/parcerias-publico-privadas
Amapá	-	Not identified	X	-	-	-
Amazonas **	Unidade Gestora de Projetos Estaduais de Parceria Público-Privada - UGPEPPP	Civil House Department (Secretaria de Estado da Casa Civil)	X	-	-	-
Bahia **	Secretaria Executiva das Parcerias Público-Privadas	Treasury Department (Secretaria da Fazenda do Estado da Bahia - SEFAZ-BA)	-	-	X	www.sefaz.ba.gov.br/administracao/ppp/index.htm
Ceará **	Secretaria Executiva do CGPPP	Planning Department (Secretaria do Planejamento e Gestão do Estado do Ceará - SEPLAG-CE)	-	-	X	www.seplag.ce.gov.br/index.php?option=com_content&view=article&id=1805&Itemid=1509
Distrito Federal **	Subsecretaria de Parceria Público-Privada	Treasury Department (Secretaria de Estado de Fazenda)	-	-	X	http://www.fazenda.df.gov.br/area.cfm?id_area=1302
Espírito Santo **	Unidade PPP (Gerência do Programa de Parcerias Público-Privadas)	Economic Development Department (Secretaria de Estado de Desenvolvimento - SEDES)	-	-	X	www.ppp.es.gov.br

Goiás **	Goiás Parcerias (Companhia de Investimentos e Parcerias do Estado de Goiás)	Treasury Department (Secretaria de Estado da Fazenda)	-	X	-	www.goiasparcerias.com.br/
Maranhão	-	Not identified	X	-	-	-
Mato Grosso	MT Participações e Projetos S.A.	Planning Department (Secretaria de Planejamento e Coordenação Geral – Seplan)	-	X	-	www.mtpar.mt.gov.br/
Mato Grosso do Sul	Unidade Central de Parcerias Público Privada (Escritório de Parcerias Estratégicas)	Government Department (Secretário de Estado de Governo e Gestão Estratégica – SEGOV)	X	-	-	-
Minas Gerais **	Unidade PPP-MG (Unidade Central de Parcerias Público-Privadas)	Economic Development Department (Secretaria de Estado e Desenvolvimento Econômico - SEDE)	-	-	X	www.ppp.mg.gov.br/
Pará	-	Economic Development Department (Secretaria de Estado de Desenvolvimento Econômico, Mineração e Energia – SEDEME)	X	-	-	-
Paraíba	-	Planning Department (Secretaria do Planejamento e Gestão do Estado da Paraíba – SEPOG)	X	-	-	-
Paraná **	CPPP - Coordenação de Parcerias Públicas Privadas	Civil House Department (Secretaria da Casa Civil)	-	-	X	http://www.planejamento.pr.gov.br/modules/cont_eudo/conteudo.php?conteudo=78
Pernambuco*	Unidade Operacional de Coordenação de Parcerias Público-Privadas – Unidade PPP	Governance Department (Secretaria de Administração do Estado de Pernambuco – SEAD)	X	-	-	-
Piauí	Superintendência de Parceria e Concessões (SUPARC)	Government Department (Secretaria de Estado do Governo – SEGOV)	-	-	X	www.ppp.pi.gov.br/pppteste/

Rio de Janeiro **	Unidade de PPP (Agência de Fomento do Estado do Rio de Janeiro S.A.)	Economic Development Department (Secretaria de Desenvolvimento Econômico Energia Indústria e Serviços – SEDEIS)	-	-	X	http://www.rj.gov.br/web/sedeis/listaconteudo?generica&forward=parceriaspublicoprivadas&label=parceriaspublicoprivadas&search-type=parceriaspublicoprivadas&secretaria=/sedeis
Rio Grande do Norte **	-	Planning Department (Secretaria de Planejamento e Finanças do Estado do Rio Grande do Norte)	X	-	-	-
Rio Grande do Sul	Unidade Executiva do Programa de Parcerias Público-Privadas	Planning Department (Secretaria do Planejamento, Mobilidade e Desenvolvimento Regional – SEPLAN)	-	-	X	www.planejamento.rs.gov.br/concessoes-e-ppps-2016-03
Rondônia	Gerência do Programa de Parcerias Público Privadas – GPPPP/RO	Civil House Department (Secretaria da Casa Civil)	X	-	-	-
Roraima	-	Not identified	X	-	-	-
Santa Catarina	SC Participações e Parcerias S.A. SCPar	Government Department (Gabinete do Governador do Estado)	-	X	-	www.scparsc.gov.br/
São Paulo **	Unidade de Parcerias Público-Privadas/UPPP	Government Department (Secretaria de Estado do Governo – SEGOV)	-	-	X	www.parcerias.sp.gov.br/
Sergipe	Conselho Gestor do Programa Estadual de Parcerias Público-Privadas de Sergipe – PROPPPSE	Planning Department (Secretaria de Estado do Planejamento Orçamento e Gestão – SEPLAG)	X	-	-	-
Tocantins	-	Not identified	X	-	-	-
Total			13	3	11	

(*) Governmental jurisdiction presented in the Brazilian Federal PPP unit; (**) States with PPP projects contracted

3.2 Literature review on PPP units and governance

The academic interest on PPP units has started around 10 years ago, much later than the beginning of research on the global subject of PPP itself. One of the reasons is the fact that most governments had initiated PPP programs without specialized PPP units. The issue of governance appeared much later, and the generalized response of governments was the establishment of dedicated public bodies, with variable legal and institutional configurations, to manage PPP projects. A summary of the main body of knowledge on PPP units is presented on Table 7.

Table 7. Summary of recent PPP units' academic research

Authors	Type of document	Type of research	Number of PPP units reviewed	Research data source	PPP Units geographical scope
Dutz et al. (2006) **	Paper	Qualitative	10	Not specified	India(2x), Canada, Ireland, Italy, Netherlands, Philippines, South Africa, United Kingdom and Australia
Sanghi et al. (2007) **	Paper	Qualitative	8	PPP units' documentation and staff interviews using semi structured questionnaire	Bangladesh, Jamaica, Portugal, South Africa, Republic of Korea, Philippines, United Kingdom and Australia
Farrugia et al. (2008) **	Working Paper	Qualitative	8	PPP units' documentation and staff interviews using semi structured questionnaire	Australia(2x), Canada, France, Portugal, South Africa, United Kingdom(2x)
Burger (2009) **	Book chapter	Qualitative	1	Not specified	South Africa
Istrate and Puentes (2011) **	Report	Qualitative	7	Not specified	U.S.A. states of Virginia, California, Michigan, Oregon, Colorado, Georgia and Washington
Mahalingam et al. (2011)**	Paper	Quantitative	3	PPP units' documentation and unstructured and semi structured interviews	India(3x)
Tserng et al. (2012)*	Paper	Quantitative	1	Not specified	Taiwan
Regan (2012)**	Working Paper	Qualitative	1	Not specified	Australia
Puentes (2012) **	Paper	Qualitative	1	Not specified	United States of America
Islam (2014)**	Paper	Qualitative	1	Not specified	Korea
Hurk et al. (2015)*	Paper	Qualitative	19	PPP unit's documentation and staff interviews using semi structured questionnaire	Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Greece, Italy, Netherlands, Portugal, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland and United Kingdom
Boardman and Hellowell (2016)* *	Paper	Qualitative	9	PPP units' value-for-money appraisal method	Australia, British Columbia (Canada), France, Germany, Netherlands, Ontario (Canada) South Africa and United Kingdom

*ISI Web of Science. **Google scholar.

Dutz et al. (2006) provided the first academic work on PPP units. This paper argues that PPP units were essential for governments to learn how to implement PPPs. After reviewing 10 national units, the authors assume that there are critical aspects to consider in order to achieve PPP units' success such as correctly set their roles, location and capacity to manage conflicts. One year later, Sanghi et al. (2007) published a note, based on the Public-Private Infrastructure Advisory Facility (PPIAF) and The World Bank (2007) report, changing the focus from the unit's success to the units influence on successful PPPs. The authors identified the expected PPP units' contributions to the success of PPP projects, and if so, under what conditions. The authors have reviewed eight national PPP units, and concluded that PPP units' inappropriate placement within the government structure and poor political support and commitment on PPP program, can strongly affect PPPs' success. Farrugia et al. (2008) applied interviews and reviewed public documents in order to access PPP units' differences and similarities. The authors use a sample of eight international units and propose two main types of PPP unit (review bodies and full-service agencies) and concluded that the type of units chosen depends on the structure, objectives and the governments' political environment.

Burger (2009) research looks into the South African PPP unit's role in the creation of PPPs. The authors conclude that this PPP unit is in charge of approving agreements and render technical assistance in PPP's maintenance and creation. Nevertheless, the government departments and provinces are reserved to take the initiative, final management and PPP's accountability.

Mahalingam et al. (2011) compared the performance of three Indian PPP units searching for the characteristics of an "effective PPP unit". The authors also claim that PPP units with administrative and specific PPP expertise are necessary but do not guarantee the project's success. The authors conclude that just the involvement of PPP units during the project's life-cycle, with governmental support, can ensure effective benefits. Istrate and Puentes (2011) analysed PPP units' potential to develop infrastructure in the United States (U.S.) PPP market. The authors concluded that American states should establish and strengthen PPP units in order to help both the public and private sector to develop and successfully implement PPP projects.

Tserng et al. (2012) research used a theoretical model and empirical data to identify the national PPP unit's role in promoting PPPs. The authors conclude that government credibility is essential for PPP programs success and points out that efficient institutions (PPP units) minimize countries resources on planning, developing and improvement of PPPs. Jooste and Scott (2012) looked into the different types of organizations formed by governments to enable and implement PPPs. The authors analysed three international PPP units and observed the presence of similar actors during the PPPs life-cycle, however presenting different characteristics and arrangements from project to project. Regan (2012) investigated PPP units' international best practices and points out that the effectiveness of PPP programs can be improved with PPP units, located in the major governmental departments, build under a highly-skilled specialist staff, technically prepared to assist both public and private sides undertaking PPPs. In other research Puentes (2012) reaffirms the same conclusions, but for the establishment of a U.S. Federal dedicated PPP unit to improve the PPP process, so protecting the public interest. Islam (2014) investigated the Korean's PPP program progress and PPP unit's contribution. He points the government's need for economic policy planning and coordination, reserving sufficient budget to undertake PPP investments. Additionally, to guarantee a professional and transparent decision-making process, PPP units' action under the PPP law will avoid harmful political pressure. The author recognizes the Korean's PPP Unit contribution to their programs' success, reaching its goals on promoting both private financial interest in maximizing its financial return, and the country's population expectations who also seek their social demands be attended. Hurk et al. (2015) used a theoretical notion of PPP-enabling fields to analyse the functions and roles from 19 European PPP units. The authors also search for the potential relation between the nationals' institutionalized PPP support and their number of PPP projects implemented. Boardman & Hellowell (2016) presented a different approach from previous studies that had analysed the PPP unit's roles, location and projects' general performance. They chose to compare and evaluate nine PPP units' documented methodologies of conducting value for money (VFM) appraisals. They attempt to describe the most correct way to do it and conclude that the public sector comparator (PSC) provides greater VFM.

After reviewing the previous literature, it is concluded that although the research field is still in a relatively poor level of development and the studies are scattered, two broad issues have been raised: 1. The governmental bodies, meaning, specific PPP units, would be essential, in order to improve the potential success of PPP; 2. The definitions of the role, functions, characteristics, similarities and differences of the PPP units studied. Most authors agreed that the interference of governmental PPP units can certainly help to achieve successful PPP projects. Nonetheless, the simple existence of a technically and managerial qualified staff in the PPP units do not ensure neither the PPP units nor PPPs projects success. The PPP units' appropriate roles definition, placement in the governmental structure and political support are fundamental to achieve the desirable PPPs.

After the literature review, the absence of studies on the Brazilian case was observed. This emerging country, considered as the eight's the world economy, the largest and richest country in Latin America, faces the challenge of augmenting its infrastructures. Therefore, a study using the previous theory background listed in this literature review, that have analysed international PPP units' data in the aspects of governance, project experiences and program results, may be justifiable.

3.3 Brazilian's PPP program review

In Brazil the first PPP implemented was the São Paulo's State contract, "yellow 4 metro line", in 2004. São Paulo did not have, at the time, a dedicated PPP unit or PPP legislation. According to the Brazilian's federal partnership law n.º 11.079 (President of the Republic of Brazil 2004) a PPP is defined as an administrative contract of concession that could be adjudicated in sponsored or administrative modality. The sponsored concession modality consists on the concession of public services or public projects in which the private partner remuneration is done by the payment of users' fees complemented by public instalments (Cruz et al., 2015). In the administrative concession modality, the private partner's compensation is given exclusively through public payments. The law also establishes a minimum of R\$20 million (about \$64 million) and at least a five year period of service provision as prerequisites for this type of contract (President of the Republic of Brazil 2004). In

2012, the federal law no. 12.766 (President of the Republic of Brazil 2012) amended the law n.º 11.079, regarding the provision of resources in favour of the private partner. Currently, from the 27 federative units, 25 have published its own PPP laws (developed under the federal law and subordinate to it), 19 have a dedicated unit divided into three joint capital companies and 16 in internal department agencies. These state laws, as a rule, form the PPP programs, defining its principles, guidelines, creating the PPP management council in the state, and indicating the state department agencies who will chair the council, and manage the PPPs.

The Brazilian Constitution of 1988 defined the limits of their autonomy and determined the subjects that can be legislated, and the limits of action of the Executive. The different constitutional competencies of the three levels of governments may suggest the sectors in which PPPs should be implemented. The federal government is responsible for building major infrastructure projects such as: interstate highways, railroads, dams, international airports, power generation and distribution. In the health sector, it finances the public health system. In the educational sector the Federal Government is responsible for higher and technical education. In security maintains the armed forces, federal police and higher courts. The state governments are responsible for the building of regional transport infrastructure and water supply projects. They are also responsible for building and maintaining hospitals and high schools, as well as for the fire department and police services. The municipalities are responsible for sanitation projects, street lighting and paving, municipal highways, public spaces and urban mobility. They also build and maintain health posts, kindergartens, elementary schools and civil guard. Considering the budgets of governments, and their debt capacity, and the minimum threshold to establish PPP contract (above R\$ 20 million), only the federal and state governments, their capitals, and some wealthier cities, would be able to engage PPP projects.

3.4 Methodology and data

The first step of the research was to decide whether all municipal, state and federal governments should be analysed together or separately. According to the 2010

Population Census (Brazilian Institute of Geography and Statistics – IBGE 2014), Brazil has 202.7 million inhabitants distributed among 5.570 municipalities that compose the 27 Federative Units. All states, the Federal District and municipalities are members of the Federation and have their administrations with different levels of autonomy. According to Radar PPP (2016), the wealthier cities are 26 municipalities from six states (Pernambuco, Mato Grosso do Sul, Rio Grande do Sul, Minas Gerais, Rio de Janeiro and São Paulo), with emphasis on the states of São Paulo and Rio de Janeiro, with 16 and five PPPs respectively, most of them being in the environmental sector.

At Federal level, there is only one project in operation. Despite the fact that Federal government has the largest budget capacity to finance PPPs in Brazil, in 12 years of history the Federal unit was only able to sign one PPP called “Datacenter Complex” (data center of the Bank of Brazil and Caixa Econômica Bank), in 2010 (Ministry of Planning, Development and Management– MP 2016).

According to Radar PPP (2016), there were 86 PPP contracts signed in Brazil. From these contracts, one is under federal jurisdiction, 48 under state jurisdiction and 37 developed by municipalities. Although they represent 43 per cent of the total of PPP units in operation, only the cities of Rio de Janeiro and Belo Horizonte had more than one PPP contract. It was also observed that 65 per cent of the other municipalities only signed one contract, usually on projects of solid waste and/or sanitation.

The majority of PPP contracts were signed (56% of the total) by 13 of the 26 states and the Federal District. Except for one of the 13 states, all the others had two or more PPPs contracts (Radar PPP 2016). This may provide evidence of the state governments interest in this model of procurement, to decrease their public infrastructural needs.

It was chosen to focus on state-level PPP units because: 1. they have the largest number of PPP projects; 2. most of the states have formal PPP units implemented and PPP laws published, that shows the governmental commitment in developing PPP programs; 3. the federal PPP program has only one project in operation and no Brazilian municipality has more than two PPPs (with exception of Belo Horizonte and Rio de Janeiro), which would offer a short number of PPP units to be analysed.

The second step of the research was to identify the states governments' databases that would be adopted. The safest and fastest way to access the PPP units' data would be to collect information from the governments' website. It was decided to follow Farrugia et al. (2008), Mahalingam et al. (2011) and Hurk et al. (2015) methodologies that have also reviewed public documents and used these publicly available databases, with the objective of analyzing its PPP units' data in the aspects of governance, project experiences and program results . All Brazilian state websites were consulted to identify the state department where the dedicated PPP units could be anchored. After the identification of all governments' websites, a database was created in order to catalogue the PPP units' information necessary to reach the chapter's objective of identifying and analyse the PPP units' experiences, governance and program results. The information was accurately organized according to the following topics: PPP unit name, sponsoring department, website location, uniform resource locator (URL), unit manager, number of staff members, contacts, PPP laws, number of PPP projects, projects title, description, grantor government department, project sector, type of project, type of concession, public calls, terms of authorization, public notices, type of modeling, bidding documents, public consultation, public audience, PPP contract value, contract signed data, concessionary, contract stage, contractual amendments and contract termination.

To deal with potentially outdated information and create some redundancy that would allow identifying potential inconsistencies, a questionnaire was created, pre-filled with the information available in their websites, and sent to each state department validation. This semi-structured questionnaire model was also used by Sanghi et al. (2007), Farrugia et al. (2008) and Hurk et al. (2015). The objective was to ask the states sponsoring departments, in charge of the PPPs, to check the information written in the survey, confirming, completing or correcting the data. The questionnaires (prepared in Portuguese) were sent by email. The first questionnaires were sent and answered between June and October 2016. In total, 21 states responded to the questionnaires and 6 have not answered.

The analysis of the data identified four basic situations: (i) states without PPP unit's or sponsoring department's website, absence of PPP project historic or legislation; (ii) states without PPP units' or sponsoring department's website, absence or

insufficient legislation and with some PPP project under study or in progress; (iii) states with incomplete PPP units' or sponsoring department's website, presence of legislation and with some PPP project under study or in progress; (iv) states with PPP units' or sponsoring department's website, presence of legislation and with some PPP project under study or in progress. The final sample resulted in 19 dedicated PPP units, 22 sponsoring departments, 93 staff members, 25 PPP laws, 205 PPP projects appraised, 19 different project sectors, 27 types of projects, 49 contracts signed from 2006 to 2016, 43 contracts operating, five non-operational contracts, one contract termination, six states with 14 contracts amended and 48 contractual amendments (Table 8).

Table 8. Profile of the analysed Brazilian states' PPP units

Profile	Number (unid.)
Dedicated PPP units identified in Brazilian states governments	19
Sponsoring departments identified in Brazilian states governments	22
Staff members working in the PPP units or sponsoring departments	93
Published PPP laws	25
PPPs projects one day appraised	205
PPP project sectors	19
Types of PPP projects	27
States with PPPs contracts signed from 2006 to 2016	13
States PPPs contracts signed from 2006 to 2016	49
PPP contracts operating	43
Non-operational PPP contracts	05
PPP contracts amended	14
PPP contractual amendments	48
PPP contract termination	01

The comparative analysis looks at three main dimensions: governance model, PPP infrastructure growth and PPP contract management. It starts analyzing the PPP units' governance, considering: the sponsoring departments at which they were subordinated; the website information publicly available; the number of staff members; the PPP units' transparency level; and the PPP's laws approved per state.

Next, it was analysed the PPP infrastructure development, considering: the identified projects (appraised, in operation, non-operational and terminated) per state; the project sectors they belong; and the type of projects and type of concessions (administrative or sponsored).

In the sequence, it was analysed the PPP programs results, considering: the publications of the projects unsolicited proposals (USP) or expression of interest (EOI); the biddings and contracts signed; and the number of PPPs per stage. Finally, the analysis presents the states with contracts amended, respective contractual amendments, and contract termination.

3.5 Comparative Analysis

3.5.1 PPP unit governance

3.5.1.1 Sponsoring departments

The sponsoring departments are the states' departments that traditionally perform the central role in the regulation and development of PPPs, and where the PPP units usually were created and located (Hurk et al. 2015). In the Brazilian states, the sponsoring departments' mandates are four years and their capacities and competences, as well as the field of action, are described in the respective state PPP laws. The results show that from the 22 sponsoring departments identified, the planning department (the department responsible for promoting and coordinate the planning and management of the state, contributing to the integration and effectiveness of public policies) stands out at the top list with seven states (Figure 9). Economic development departments and government departments appear in second with four states and chief of staff department and treasury department in

third each one with three. These outcomes evidence the multidisciplinary nature of sponsoring departments areas, involving typically departments in charge of planning costing and investment expenditures (e.g., planning department, economic development department and treasury department) or departments under direct command of the state governor (e.g., government department, chief of staff department and administration department).

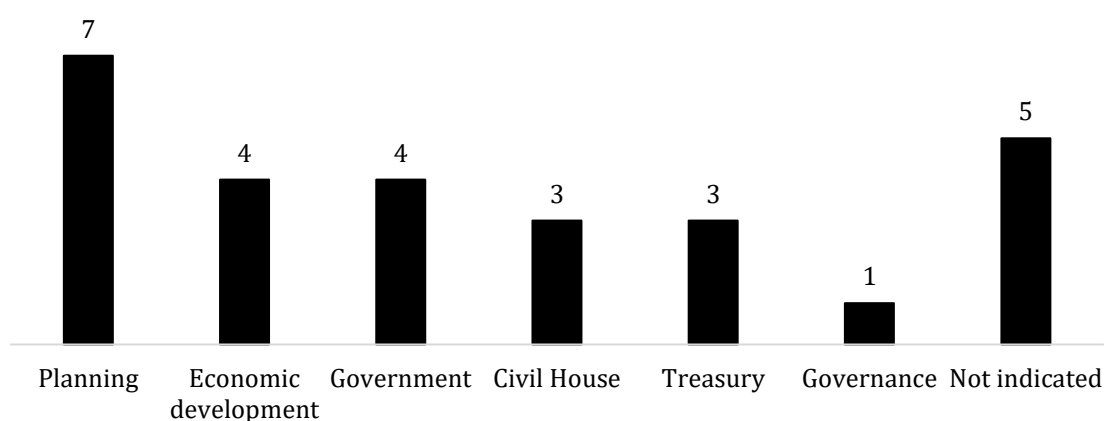


Figure 9. Number of sponsoring departments responsible for PPP units

3.5.1.2 Staff

The staff members are usually the states' government employees in charge of implementation, development and/or PPPs' project governance. Hurk et al. (2015) have also addressed PPP units' size classifying in ranges instead of an exact number of staff members. They used this methodology in order to form a score to link the PPP units with PPP activity in the analysed countries. Due to the limited information provided by the Brazilian's departments, future research may draw other complementary data to measure the appropriate number of members to efficiently manage a PPP unit, rather than the number of projects implemented. The experience, education and capability of these staff members may be some of these aspects to be studied and compared. From the 19 states that made the information available, Piauí stands out at the top of the list with 12 members. Distrito Federal and Goiás appear in second, with nine members, followed by Mato Grosso and Santa Catarina, with eight members. Minas Gerais is in the fourth place, with seven

members and Bahia in the sixth, with four members. The average number of members per PPP unit is around five. Table 9 contains the number of staff members per PPP unit.

Table 9. Number of staff members per PPP unit

State	Number of members
Piauí	12
Distrito Federal	9
Goiás	9
Mato Grosso	8
Santa Catarina	8
Minas Gerais	7
Mato Grosso do Sul	5
Rio Grande do Sul	5
Rondônia	5
Bahia	4
Paraná	4
Pernambuco	4
Rio de Janeiro	3
Sergipe	3
Amazonas	2
Ceará	2
Espírito Santo	2
Alagoas	1
Roraima	0
Acre; Amapá; Maranhão; Pará; Paraíba; Rio Grande do Norte; São Paulo; Tocantins	*
Total	93
Average number of team members reported	4.9

*Number not informed by the State

3.5.1.3 Number of PPP laws

In Brazil, the publication of the state's PPP law has been the first step to implement its state's PPP program. Although the mere publication of a state's PPP laws does not ensure that the government obtains successful projects or programs, but the publication of these laws may serve to measure a PPP unit maturity level.

Regarding the number of state's PPP laws approved annually, in the period from 2003 to 2005, there was a growing number of laws being published, up to 10, as a result of the increasing interest that state governments had in adopting this procurement model. The second wave of 10 publications came from 2006 to 2009. In 2010 none of the states published PPP laws. The last wave of five laws published came from 2011 and 2012. From 2013 till 2016 only two remaining states (Acre and Roraima) still have not published PPP laws.

This scenario may demonstrate that almost all state governments in Brazil had interest in PPP procurement and that the engagement of the last two states should be a matter of time, depending mostly on the next state governors' strategic views (Figure 10).

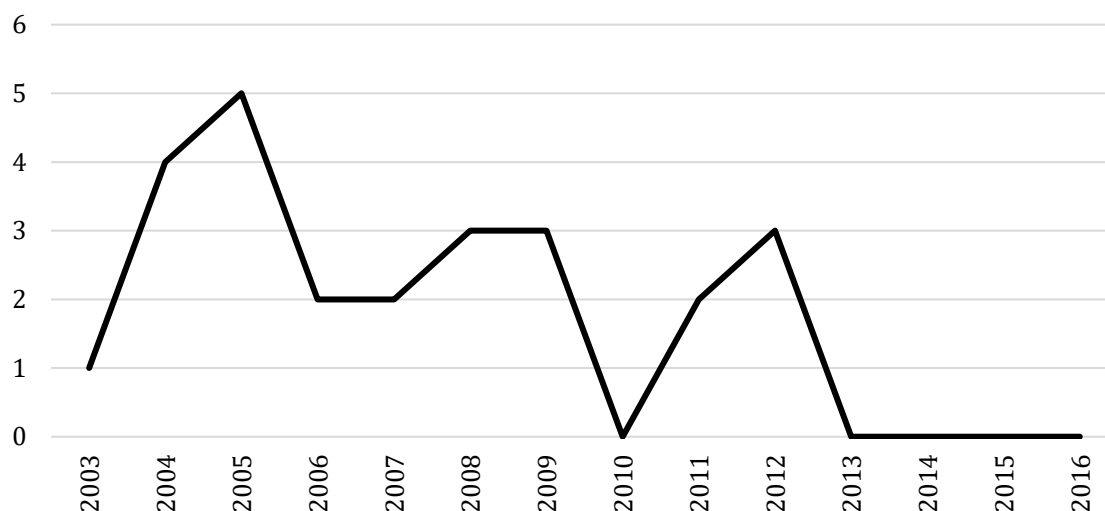


Figure 10. Number of PPP laws approved per year

3.5.1.4 Transparency

Among the 27 federative units analysed in this chapter, 13 have no website to provide information about their PPP programs. Only three have their own website, independent from the sponsoring departments' website. It was also noticed that these three PPP units are joint capital companies, created by the state governments to promote investments in the State through the feasibility and operationalization of PPPs. The other 11 PPP units provide information from a sponsoring department website's link. The results also show that, from the 13 states that have PPP contracts

signed, three states (Amazonas, Pernambuco and Rio Grande do Norte) have no websites available, addressing these states PPPs information (Appendix S3). This may be evidence that half of Brazilians' governments still have to invest in public transparency, not only internally among its partners but also in the dissemination of these contracts to the population, through the Internet. Although the implementation of a PPP unit's website is an important step towards a government's information transparency policy, its full success will depend directly on the relevance, reliability, level of detail, updating, quality and ease access to information available to citizens.

Table 10 presents the type of information available on the PPP units' websites. This table classifies the PPP units' transparency level according to the amount of information available. The classification ranges from high, medium, low and very low. The transparency level was evaluated by gathering the states that have the same characteristics, such as if a website is implemented, legislation published, projects contracted (or under evaluation) rating them according to the available amount of this information. This is a similar approach to Hurk (2015) that also classified 19 PPP units in: "total score of PPP-supporting unit" versus the "degree of PPP activity". This method intended to link the PPP units with PPP activity data. The results show that from the six units with the highest degree of transparency (Bahia, Espírito Santo, Mato Grosso, Minas Gerais, Piauí and São Paulo), São Paulo, Minas Gerais and Bahia are the states with the greater number of contracts in operation respectively. These units have already implemented PPP projects and tend to have more information available on their websites, thanks to the greater experience, administrative capacity and staff experience. On the other hand, the states of Piauí and Mato Grosso do not have yet contracts in operation. Despite that, they have been cited thanks to their recent work on 13 projects in the process of contracting, and their efforts to disseminate the development of their PPP's programs and the structuring and scheduling of their projects. Another finding is that the Rio Grande do Sul and Santa Catarina are the only ones, from the eight Medium level states, classified, that still have not signed PPP contracts. A final remark is that all 13 states considered low and very-low transparency level, representing almost half number of the Brazilian states, have no website with PPP information available and 11 out

of these 13 states are in the country's regions with the lowest Gross domestic product (GDP) in Brazil: six in the North and five in the Northeast. Surely it is the first attempt to measure the Brazilian's PPP units' transparency using the database available, but to increase the conclusions accuracy, future researches may develop other mechanisms rather than measure the public access to information.

Table 10. Type of information available in the PPP unit's websites

Available Information	States	PPP units' transparency level	Number of States
There was a detailed website, available legislation and projects contracted or under evaluation	Bahia, Espírito Santo, Mato Gross, Minas Gerais, Piauí, São Paulo.	High	6
There was a website with scarce information, available legislation and projects contracted or under evaluation	Alagoas, Ceará, Distrito Federal, Goiás, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina.	Medium	8
There was no website, or it is not available. None or insufficient legislation and there is some project contracted or under evaluation	Amazonas, Mato Grosso do Sul, Pará, Paraíba, Pernambuco, Rio Grande do Norte, Rondonia, Sergipe.	Low	8
There was no website, or it is not available. None legislation and neither project contracted or under evaluation	Acre, Amapá, Maranhão, Roraima, Tocantins.	Very low	5
TOTAL	-		27

3.5.2 PPP infrastructure growth

3.5.2.1 Number of PPP projects identified per state

All projects identified by this research were classified into four categories: i) projects appraised, ii) contracted and in operation, iii) contracted and abandoned projects and iv) contracts termination. The idea was to present the relation between the projects (per state) that have been appraised against the ones who reach the stage of being contracted, currently in operation or not (Figure 11). All of these

projects are being part of a sample of 205 PPP projects appraised and identified in this research (Appendix S3). The finding shows that 49 projects were effectively contracted, being 43 of these contracts currently in operation, five were abandoned and one contract terminated. The states that have implemented more contracts were São Paulo, Minas Gerais, Bahia and Pernambuco, with eleven, ten, six and three in operation, respectively. They are followed by the states of Ceará, Amazonas, Distrito Federal, Alagoas and Espírito Santo with two contracts each one. Finishing the list, the states of Paraná, Rio de Janeiro and Rio Grande do Norte with one contract each one. The five contracted and abandoned projects were finished all procurement process, but the state governments decided to do not implement them. These projects were identified in the states of Ceará with two (Vapt-Vupt and the Cable-stayed bridge over the Cocó River), Amazonas with one (Penitentiary Complex), Distrito Federal with one (Integrated Management Center) and Goiás with one (Goiania Light Rail – Anhanguera). The Integrated Center of resocialization of Itaitinga is a PPP contracted by the state of Pernambuco on October 9, 2009, and it was declared terminated by expiry reasons in 16 of March of 2016.

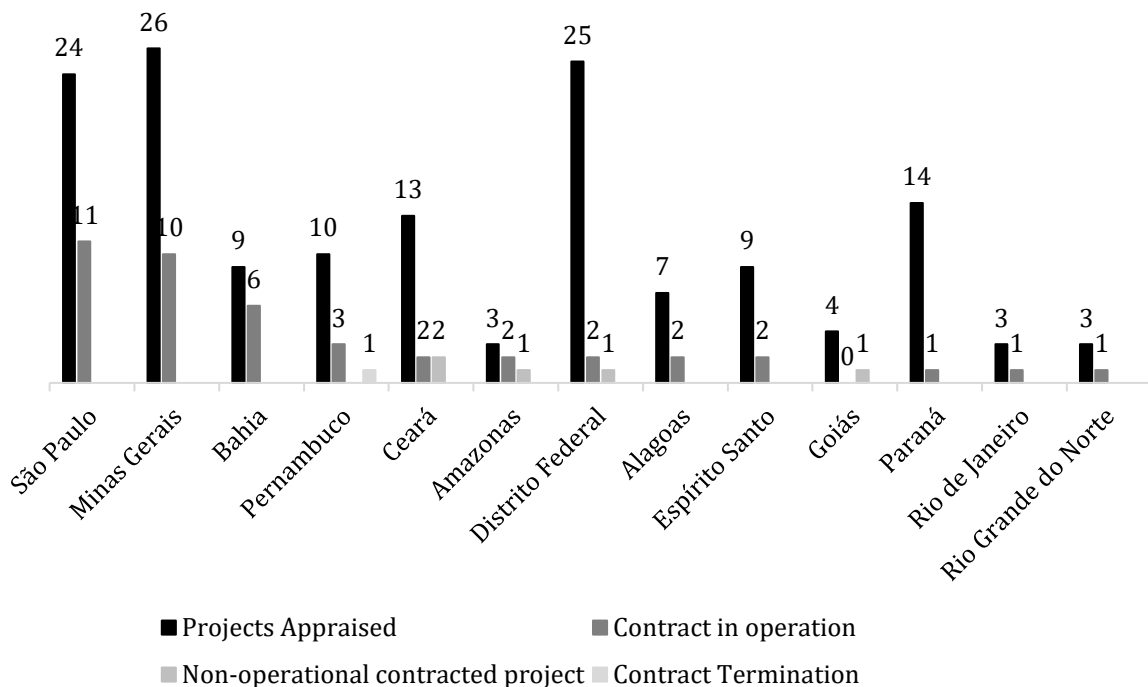


Figure 11. Number of projects per stage and state

3.5.2.2 Projects sectors

In this section, the projects contracted and appraised were ranked according to the projects' primary sectors. Figure 12 contains a ranking of the 49 contracted projects, divided into seven sectors classifications: transportation, environment, health, administration, sports, security, housing and urban development. The results show that the top-three sectors are transportation, environment and health with thirteen, ten and eight contracts, respectively. As supposed, the number of projects appraised is much larger than those that have been contracted, and in the sectors with more projects appraised are usually those that have the largest number of contracts signed. Over the last 10 years, Brazilian state governments have been investing significantly in subways, roads, light rails, sewage and water supply systems, hospitals and health centers, which have justified the private partnership and interest for this market share. The transportation and the care with the citizens' health were also the first sectors experiences on PPP contracts (Neto et al. 2016). The results also depict that the administration and sports sectors together have contracted 12 projects, 1 project less than the ranking's sector leader (transportation) and 2 projects more than the second (environmental). Projects such as administrative centers and citizen services (administrative sector) represent six of the 49 contracts signed. In the case of the sports sector, the advent of the 2014 International Federation of Association Football (FIFA) World Cup in Brazil motivated the contracting of six stadiums.

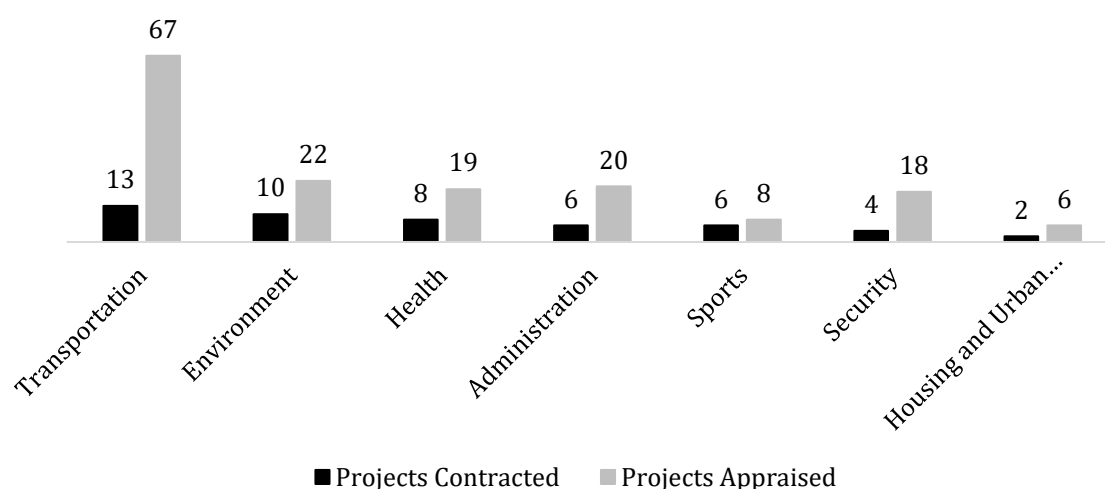


Figure 12. Projects contracted or appraised by sector

3.5.2.3 Type of projects

Figure 13 presents the 49 projects contracted and analysed in this chapter divided into 14 types of projects: hospitals with seven, followed by sewage systems and stadiums with six each one, and citizens services centers and subways with five each one. These five top types of projects belong to the top five projects sectors (mentioned earlier) of transportation, environment, health, administration and sports, but not necessarily in this order. Individually, hospitals and sewage systems lead the states attention to increase the supply of public health conditions in Brazil. Ratifying what was mentioned earlier, “stadiums” appears as the third most contracted project thanks to the advent of the 2014 FIFA World Cup in Brazil. The fourth and fifth most contracted projects belong to the administration and transport sectors. Confirming the trend shown in the previous item (top projects sectors) the number of projects appraised is always much larger than those that have been contracted, but it is not observed that the sectors with more projects appraised are those that have the largest number of contracts signed.

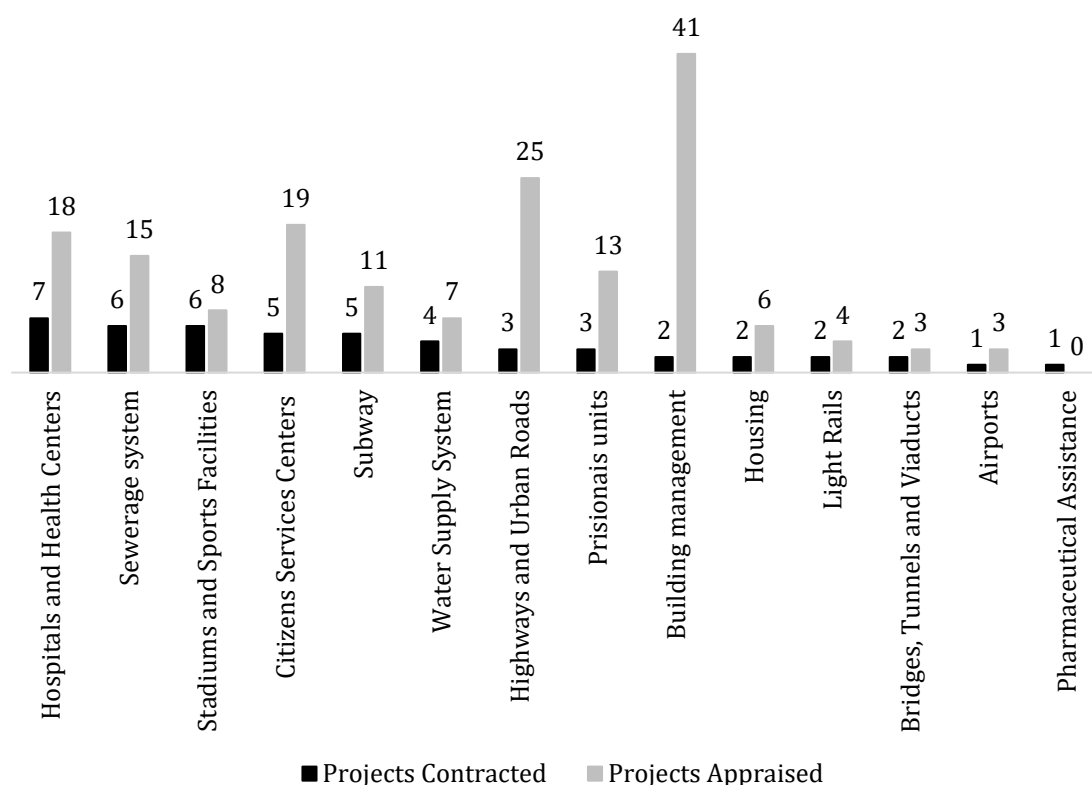


Figure 13. Projects contracted and appraised for type of project

3.5.2.4 Type of concession

As mentioned earlier, in Brazil the PPP projects are classified into two types: administrative or sponsored concessions. From the 205 projects appraised in this chapter 89 were identified (in the websites or in the questionnaires) as administrative and 28 as sponsored concessions (Figure 14). Regarding the number of contracted projects concessions, 37 were administrative and 12 sponsored concessions. The sponsored concessions are four subways, four roads, two light rails, one airport and one bridge, all of them from the transportation sector demanded and sponsored by the users.

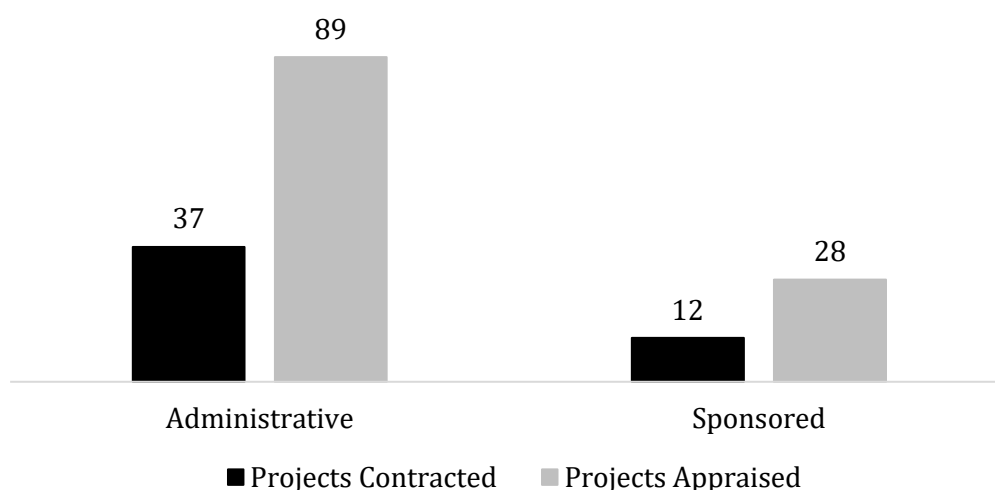


Figure 14. Number of projects per type of concession

3.5.2.5 Procurement process

Among the 205 projects appraised presented in this chapter, there was no information available (in the PPP units' website or in the answered questionnaire) for all of them, being only 18 projects with USP and 66 projects with EOI information available. Even between the projects contracted the information not covers all the 49 projects, only a total of 30 projects were classified as USP or EOI (Appendix S3).

The same absence of information was detected for the documentation of the projects appraised bidding process. Only 57 projects have available information. However, regarding the projects contracted, all 49 projects information were available. All these projects also became contract signed (Figure 15). Considering the number of

PPP contracts signed per year, in 2006, three projects progress from five bidding becoming contracts signed. In 2007 no bidding documents were published and only one contract was signed. In the period from 2008 to 2010, there were a growing number of contracts being signed, up to 12 in this period. In 2011 only one bidding document was published and one contract was signed. The biggest wave of contracts signed happened from 2012 to 2014, with 27 contracts signed. In 2015 no bidding documents were published, and the contract signed dropped to five. Until December of 2016, no projects achieved the bidding process or became a contract signed, as a result of the political and economic crises established in the country at that time. The state's elections in Brazil happen every four years. As mentioned before, the years 2007, 2011 and 2015 exhibit the lower number of tenders and contracts signed, coinciding exactly with the first year of the new state's governments. In the opposite way, the last year of political mandates typically have the biggest number of contracts signed, 2006 with three, 2010 with seven and 2014 with 14, respectively.

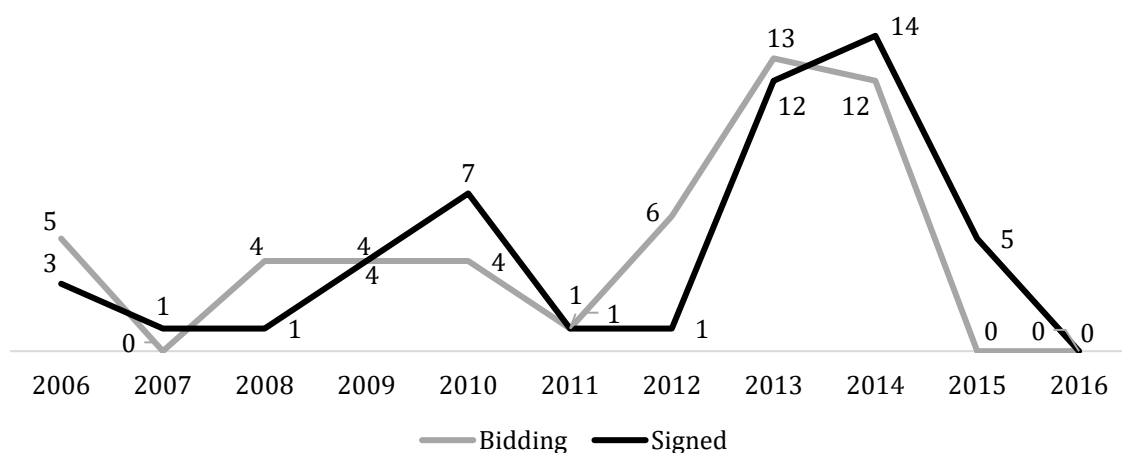


Figure 15. Number of biddings documents published and contracts signed per year

3.5.3 PPPs' Contract Management

3.5.3.1 Number of PPPs per stage

In this section, all projects were ranked according to its current stage. It was considered eight PPP stages: project appraisal, EOI, USP, Public consultation,

bidding, contract signed, contract running and contract termination. A ranking was made to evidence the 205 projects appraised (Figure 16). The results show that 66 projects achieve the EOI stage. The results also show that from the 57 projects appraised, 43 are contracts running and 18 USP were authorized, since 2006. In terms of PPP project's life-cycle, it is observed that 41 per cent of the projects examined are in the proposal stage (66 projects on EOI and 18 on USP), 28 per cent are currently being appraised (57 projects), and 21 per cent are being operated. Thenceforth, the other stages together represent less than 10 per cent of the projects identified. They are nine projects under public consultation, six bidding processes, five contracts signed (waiting to start) and one contracted terminated as the last stage.

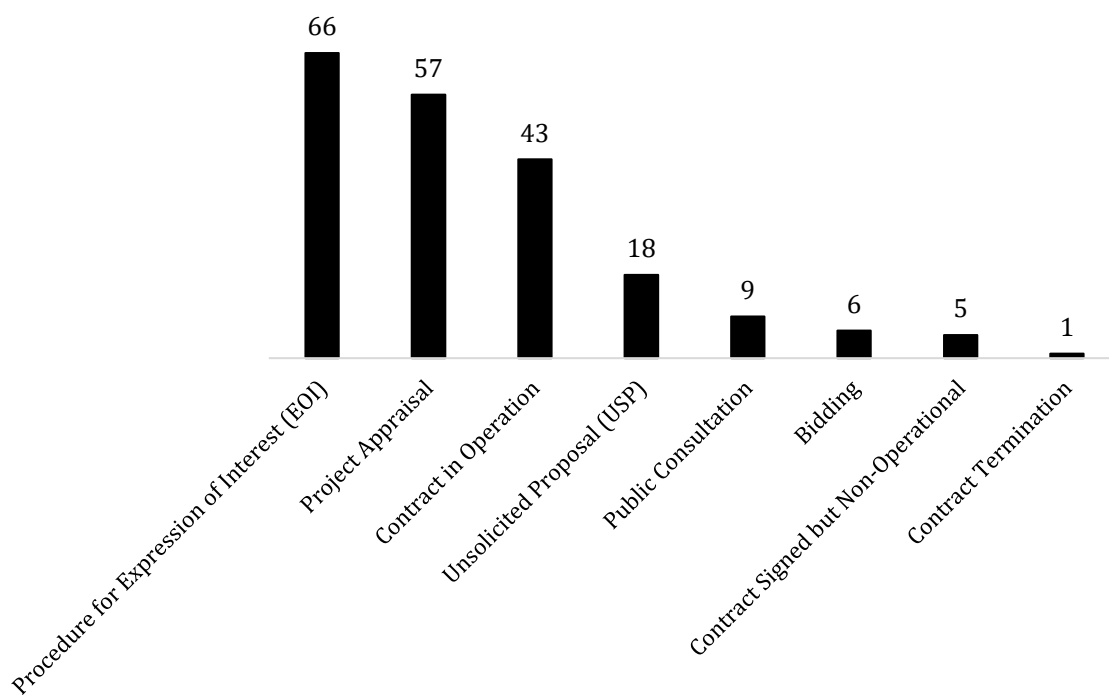


Figure 16. Number of projects per PPP stage

3.5.3.2 Number of contracts amended and contractual amendments

In this section, the number of contracts amendment and the contractual amendments per state were ranked according to the states where it occurred. Likewise, the number of projects contracted in each state was indicated. The ranking evidence the six states where the 14 contracts amendment and 48 amendments took place, in a universe of 32 contracted projects (Figure 17). The six states identified

were: Minas Gerais, Bahia, São Paulo, Amazonas, Paraná and Rio de Janeiro. The results show that the three leading states were Bahia, Minas Gerais and São Paulo with five, four and two contract amendments, respectively. The same three states lead the number of contractual amendments, but the order changes to Minas Gerais, Bahia and São Paulo with eighteen, seventeen and seven amendments, respectively. The other states have one contract amendment each one with Amazonas leading these group with three contractual amendments. Considering the number of projects contracted, the state of Rio de Janeiro and Paraná leads with 100 per cent of the contracts amended, followed by Bahia with 80 per cent. The lowest proportion was in the states of Minas Gerais, Amazonas and São Paulo, with 40 per cent, 33 per cent and 18 per cent, respectively. These results may indicate poorly written contracts, inappropriate risk allocation, and other managerial or political issues that should be deeply investigated in future researches, with a more detailed database. As expected, the three state governments that have more investments in PPP projects, had the highest number of contracts amendment and contractual amendments. However, over these evident PPP Brazilian states, the proportion of the number of contracts amended against the projects contracted by the states of Minas Gerais and São Paulo is more modest than Bahia, or even the other poorer states cited in figure 17.

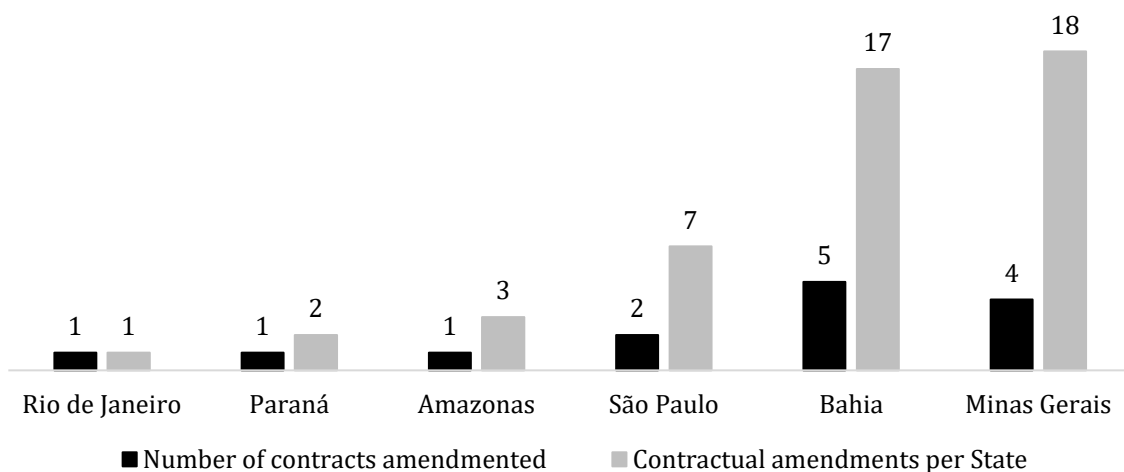


Figure 17. Number of contracts amended and contractual amendments per state

3.6 Research limitations of the PPP units and governance

The type of comparative analysis undertaken in this chapter is not immune to criticism and it contains some limitations. First, this research sample is limited to the Brazilian state government's level. The federal PPP unit had only one PPP contract in operation and the majority of Brazilian's municipalities operate only one PPP in the environmental area, which may demonstrate not enough scale to implement a PPP unit. The information from other international experiences was limited to the content of previous works analysed in the bibliographic review, and it was not possible to draw direct comparisons between other PPP programs around the world.

Secondly, the results were limited by the absence of the questionnaire's answers from some state PPP units or sponsoring departments. Another limitation in this research is regarding the PPP units' websites research and questionnaires applied. Sometimes inexperienced teams, or disqualified staff responsible for completing the questionnaires, allowed questions not to be answered correctly. There was also the problem of non-uniformity of the sponsoring departments. In Brazil, each state has its own PPP legislation, based on the PPP national law, but empowering different departments in each state. The PPP Brazilian's state councils are chaired by the sponsoring departments. Therefore, a state planning department has a management structure and posture to generate PPP units different from other sponsoring departments of government, chief of staff or treasury, for example.

Finally, due to the limited time and databases raised, it was not considered the impacts of regional influences such as local government, local economy, enterprise, education or natural resources, creating opportunities to further academic research that may be done to complement and develop this theme.

3.7 Results discussion and partial conclusions

The objective of this chapter was to analyse the Brazilian state PPP units and programs' development. The research presents unique information available from the Brazilian state PPP projects appraised and all projects contracted. This analysis allows identifying the main gaps and opportunities in the Brazilian states' programs, highlighting the main opportunities for future research in this unexplored field.

Despite the multidisciplinary nature of the top six sponsoring department's areas, all these departments are invariably responsible for the state budgeting and/or for the government's strategic decisions. This may indicate that politicians like to have PPP contracts in places of their trust and control of accounts. However, the competencies of certain departments to oversee the main PPP processes, or for reasons of administrative efficiency, should also be considered in future studies. In the PPP life-cycle, the promoting department's role is mainly to present their projects demands to the government (that evaluates which procurement model is more adapted for the project) and assist the sponsoring department (or PPP unit) with project's technical information required. In relation to the states PPP units' content location on the internet, it is noticed that only half of the Brazilian states have PPP information available on the web, and three of 13 states with contracted PPPs have no websites addressing the PPPs information. This may demonstrate that, although most governments that already have signed PPP contracts are a concern with the need of making this information available. The next step to an effective transparency policy depends on its level of detail, reliability, relevance, updating and easy access to the population. Another conclusion is that the number of projects contracted is not necessarily proportional to the number of staff members per PPP units. The PPP units with the largest number of members have not so many projects contracted as PPP units with half number of members, which may demonstrate a tendency that more condensed teams are more skilled and efficient. However, future research analyzing aspects such the composition, organization, training, and capacity of these staff members may indicate more accurately the number of members to efficiently manage a PPP unit, rather than the number of projects implemented. The PPP units' transparency level list created, contribute to highlighting the states with high, medium, low or very low level of information

available on the website, legislation, projects contracts or under evaluation. All states that already contracted projects have their PPP units classified in high, medium and low level. The three states that have more contracted projects also appear in the PPP units' with high-level transparency. Thanks to greater team experience and administrative capacity, these units tend to have more information available on their websites. The other PPP units have devoted less attention to the quality of the information available, being classified as medium or low-level transparency. At the end of the list, five states PPP units' have been considered with very-low transparency level, and two states of them (Acre and Roraima) prove their lack of interest being the only Brazilian states that have never published a PPP law. Another conclusion is that one in every four projects appraised became contracts signed, 10 per cent of these contracts signed are non-operational, and only one contract was terminated. It demonstrates that, although the proportion of project appraised that eventually became contracts is considerable, there are still cases where these appraisals did not prevent cases of non-operation or even termination of the contract. The sectors that have the highest instances of non-operation and termination are the transport with 40 per cent of the cases, and the security sector that has one non-operational project and also have the only Brazilian project terminated. Most of the PPPs implemented in the Brazilian states were projects in the sectors of transport and human health care, thus demonstrating the initiative of the public sector to meet this social and economic demand, as well as a private sector attraction for this market share. The temporary event of PPPs in the sports sectors is explained by the advent of the World Cup and the Olympic Games in Brazil (in 2014 and 2016, respectively). One-fourth of the 49 PPP projects contracted are from the transportation sector, all very costly concessions that require additional sponsorship from the citizens. This analysis also allowed identifying the period of governments' administration that is more or less willing to sign PPP contracts. Governments have been particularly biased to sign contracts in the last year of government and having the opposite tendency in the first year of government. It may demonstrate that the PPPs take a considerable time to be implemented and also that new governments do not appear to fill comfortable to bid and sign PPP contracts not generated in their administrations. Finally, this analysis also exposed the connection between the PPP units and the PPP contracts performance. The

insights come for instance from the information of the states that have contracts amended. The three states with the highest number of contracts amended and contractual amendments are the ones that have the most experimented PPP units and the most numerous numbers of PPPs contracted. This is a major gap for governments that are now being challenged to understand what is going wrong with its PPP units and projects performance, and also the private sector that is facing difficulties in complying the premises of terms and prices signed in the PPPs contracts. The future research on PPP units and PPP projects performance should address these issues engage new data also from the federal and municipal administrative sphere.

So, it can be concluded that Brazilian PPP units still have to significantly improve PPP public transparency; in Brazil, until now a reduced number of PPP projects is implemented; when a new government is elected officials tend to avoid implementing PPP projects that have not been initiated in their mandates; and the number of renegotiations during PPP contracts is extremely high.

Chapter 4. Overview of Brazilian Renegotiations

4.1 Introduction⁴

The use of public–private partnerships (PPPs) has been growing in developing countries as a procurement tool, which is used to fill the gap of infrastructure delivery and the shortage of public financing to cope with investment requirements (Miranda Sarmiento & Renneboog, 2016). Even in developed economies, such as the United States, the United Kingdom, or Australia, governments have used PPPs to leverage private capital and to upgrade and maintain their infrastructure assets (Hodge, Greve, & Boardman, 2017). In this chapter, it is intended to look on a particular topic of PPP renegotiations, under a specific context: the Latin American and the Brazilian experience. In this chapter, it is looked at the motives and consequences of renegotiations from the Latin American experience, using the case of PPPs in Brazil, providing a unique analysis of this case. Brazil is the largest economy in Latin America and has been developing an ambitious program of PPP projects. It is reviewed 27 projects, with a total of 84 renegotiation events, covering sectors such as transport, environment, sports, health, security, and housing. Our study intends to understand the main motives of such renegotiations and to try to understand potential patterns related to the type of project, nature of shareholder, state, sector, or risk allocation, among other aspects.

Although several definitions exist for PPPs, for the purpose of this chapter, it will be used the general definition of a partnership (contractual or institutional) between the public and private sectors for building, financing, managing, and operating a certain infrastructure, which is typically developed in the following sectors (among others): transport, environment, health, energy, and security (Iossa & Martimort, 2015). Therefore, it is used the general PPP definition of the Organization for Economic Co-operation and Development: “. . . *an agreement between the government and one or more private partners (which may include the operators and the financiers) according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the*

⁴ The content of this chapter was published in the paper “Understanding the patterns of PPP renegotiations for infrastructure projects in Latin America: The case of Brazil”, *Competition and Regulation in Network Industries* 1(26).

profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners.” (2008, p. 17)

There are several reasons that justify the attractiveness of this procurement model, such as mitigating the fiscal constraints allowing for a reduction of the infrastructure gap; increase public sector efficiency, providing more value for money; transferring risks to the private sector; and allowing public sector to focus on strategy rather than operational management and the advantage of contract bundling—a single contract with one entity. But two provide the fundamental basis: (i) the ability to raise private capital to finance infrastructure development and overcome the difficulties of governments to meet the financing requirements (Grimsey & Lewis, 2002, 2005) and (ii) the potential efficiency gains leveraged on the higher level of know-how, expertise, and managerial capacity of the private sector (Cruz & Sarmiento, 2017; Meda, 2007). This trend toward the transfer of traditionally core Government functions to the private sector, particularly in economically based public services, can be framed within the New Approach to Public Administration (see more in Bryson, Crosby, & Bloomberg, 2014).

Nonetheless, the use of PPPs has also involved a significant level of criticism. Among the pitfalls (lack of value for money, affordability, accountability, and the efficiency of the use of public resources, among others, see Miranda Sarmiento & Renneboog, 2014, for a list of such pitfalls), one is often cited in the literature as being one of the largest problems with the use of PPPs—renegotiation (Cruz & Marques, 2013a; Guasch, Laffont, & Straub, 2003; Miranda Sarmiento & Renneboog, 2017). It is used the definition of Guasch (2004) that a renegotiation of PPP contracts involves a change in the original contractual terms and conditions, as opposed to an adjustment that takes place under a mechanism defined in the contract.

In the case of contractual PPPs, which are the most widely used models, the partnership is structured through a contractual agreement that establishes the remuneration level, level and quality of service, and the obligations and rights of both parties, just to mention the main elements. This contractual agreement is supported by several assumptions in terms of revenue and cost forecast, and investment levels, thus providing an estimated return for investors. Renegotiations

occur in the event of certain changes or new circumstances that might affect that level of return, or when Government decides to change project features, or is unable to fulfill its obligations, or whether the expected demand/consumption is below a predetermined level, or the market conditions change, and so on (Estache, Guasch, & Trujillo, 2003). The literature has provided some evidence of the consequences, motives, and results of these renegotiations in Latin America (Estache et al., 2003; Estache, Guasch, Iimi, & Trujillo, 2009; Guasch, Laffont, & Straub, 2006, 2007, 2008; Guasch & Straub, 2009), Chile (Engel, Fischer, & Galetovic, 2009), Portugal (Cruz & Marques, 2013a, 2013b; Miranda Sarmiento & Renneboog, 2017), France (Athias & Saussier, 2018; Chong, Huet, & Saussier, 2006; Squeren & Moore, 2015), and Germany (Lohmann & Rotzel, 2014).

Results from our study show that the Brazilian experience in renegotiating PPPs is similar to the Latin American experience provided by the literature. There is some evidence (albeit weak) that electoral cycles may impact the occurrence of renegotiations. Also, the likelihood of renegotiation is affected by the allocation of the demand risk. When allocated to the private sector, it increases the probability of a renegotiation event. Also, the presence of the left-wing political party in power tends to increase the likelihood of renegotiations. This chapter contribution is the following: As the literature on PPP renegotiation has been using mainly, for data set purpose, the Latin American experience, this chapter complements the previous work done, by looking into the Brazilian experience. Also, the Latin American experience was focused on concessions awarded during the 80s and the 90s. Our chapter evolves for PPPs (and not concessions) and more recent contracts. The fact that our sample is composed by contracts signed in the last decade should provide evidence if the lessons from previous concession renegotiations described in the literature were used to improve the legal, institutional, and contractual framework. Evidence shows that the main triggers for renegotiations described in the literature are still responsible for most of the renegotiation events. Finally, as far to our knowledge, the Brazilian experience of PPP renegotiation has not been analysed before. In this chapter is covered several network industries (roads, water, and wastewater), along with nonnetwork industries (prisons, health, and sports). Also, it combines economic and policy approaches.

This chapter is organized as follow: after this introduction a brief review of the literature on PPPs and renegotiations. Methodology and data are presented in the third section, with results and discussion in fourth section. The fifth section presents the policy implications and the last section concludes the chapter.

4.2 Literature Review of PPPs and renegotiations

Research on PPP renegotiations is increasing significantly. Not only is the number of existing PPP projects is growing worldwide, but there are also more data on the execution of existing contracts. Research on PPP renegotiation has been mainly focused on the Latin American experience and Europe. In this section, it is provided a brief review of the theoretical ground of renegotiations in the context of PPPs and, afterward, for the specific context of PPPs in Latin America.

Renegotiations are essentially a problem of contract incompleteness (Hart & Moore, 1988, 1999). Contract theory supports the argument that no contract can be considered as a complete contract. A complete contract is the ability to address any possible contingency or if an unforeseen event is perceived as being impossible, or, at least with prohibitive transactions costs (Hart, 1988). This leads to the question of the likelihood of events occurring and changes the scope or definition of contracts. This likelihood is perceived to be affected by exogenous determinants, which is the context where the contract is established (e.g. political, social, economic, cultural, regulatory, etc.) and is endogenous (the project itself, such as scale of investments, changes in the market, in technology, users' preferences, etc.) (Cruz & Marques, 2013a; Sumkoski, 2016).

A description of the main body of knowledge on PPP renegotiation's academic research is presented in Table 11.

Table 11. Synthesis of renegotiations' academic research

Authors	Topic	Type	Approach	Sample size	No. of Contracts Renegotiated	Period of analysis	Sector	Geographical scope
Guasch et al. (2003)	Regulation model; policy implications and exogenous determinants	Quantitative	Theoretical and Empirical	954 (b)	307	1989-2000	Transport and water	Argentina, Brazil, Chile, Colombia and Mexico
Estache et al. (2003)	Price caps, efficiency and payoffs	Qualitative	Empirical	954 (a) (b)	-	1989-2000	Telecommunications, energy, transport and water	Latin American and Caribbean Countries
Guasch et al. (2006)	Government-led renegotiation	Quantitative	Theoretical and Empirical	954 (b) (e)	307	1982-2000	Telecommunications, energy, transport and water	Latin American and Caribbean Countries
Guasch et al. (2006)	Regulation model	Quantitative	Theoretical	-	-	-	-	-
Ho (2006)	Policy implications; model for financial renegotiations	Quantitative	Theoretical	-	-	-	-	-
Engel et al. (2006)	Renegotiation and infrastructure spending	Quantitative	Theoretical and Empirical	16	12	1998-2002	Transport	Chile
Guasch et al. (2008)	Determinants of renegotiation	Quantitative	Theoretical and Empirical	954 (b)	307	1989-2000	Transport and water	Argentina, Brazil, Chile, Colombia and Mexico
Guasch and Straub (2009)	Corruption	Quantitative	Empirical	954 (b)	307	1989-2000	Transport and water	Argentina, Brazil, Chile, Colombia and Mexico
Estache et al. (2009)	Multi-criteria auctions probability of renegotiations	Quantitative	Theoretical and Empirical	96	-	1989-2000	Transport	Latin American
Engel et al. (2009)	Soft-budgets	Quantitative	Theoretical and Empirical	-	50	1993-2006	Transport, security, environment and others	Chile
De Brux (2010)	Cooperative renegotiation	Qualitative	Empirical	-	2	-	Transport	Kingdom of Cambodia and other not identified
Cruz and Marques (2013a)	Endogenous determinants	Qualitative	Theoretical and Empirical	-	01	2005	Transport	Portugal
Cruz and Marques (2013b)	Exogenous determinants	Quantitative	Theoretical and Empirical	-	87	1984-2008	Transportation, roads, rails, ports, health, water and energy	Portugal

Xiong and Zhang (2014)	Model for financial renegotiations	Quantitative	Theoretical and Empirical	-	01	-	Transport	Hypothetical
Lohmann and Rötzel (2014)	Opportunistic Behavior	Quantitative	Empirical	-	108	-	Security	Germany
Zhang and Xiong (2015)	Determinants of renegotiation; endogenous determinant and opportunistic Behavior	Qualitative	Empirical	-	8 (c)	-	Highways, airports, power plants, and water supply and drainage facilities	United Kingdom, the USA, Argentina, Mexico, Cambodia and China
Domingues and Zlatkovic (2015)	Endogenous determinants	Qualitative	Empirical	-	9	-	Transport	Portugal (04), Spain (02), Greece, Cyprus and Netherlands
Macário et al. (2015)	Analysis of best practices	Qualitative	Empirical	-	1	-	Transport	Portugal
Squeren and Moore (2015)	Local elections impacts	Quantitative	Empirical	-	1	1968-2008	Transport	France
Xiong and Zhang (2016a)	Price caps, efficiency and payoffs; soft budgets; endogenous and real option value renegotiation	Quantitative	Theoretical and Empirical	-	1	-	Transport	Hypothetical
Sarmento and Renneboog (2016)	Endogenous determinants	Qualitative	Empirical	-	2	-	Transport	Portugal
Domingues and Sarmento (2016)	Exogenous determinants and triggers of renegotiations	Quantitative	Empirical	-	32 (d)	-	Road and railway	13 European countries
Sarmento and Renneboog (2017)	Exogenous determinants and triggers of renegotiations	Quantitative	Theoretical and Empirical	-	35	1995-2015	Roads, railway, ports, health, security	Portugal

(a) This paper uses the Guasch et al. (2003) general data base.

(b) Data base developed by the World Bank.

(c) Four are early-termination contracts

(d) Data base developed by the COST Publications.

(e) This paper uses the Guasch (2004) data base.

- Not available

Applied research in the field of renegotiations with the use of real empirical data started in 2003, with the initial paper of Guasch, Laffont, and Straub (2003), where almost 1000 concessions were analysed. In this article, the authors found that the regulatory framework (existence or not of a sector regulator) and political cycles are factors that have a direct influence on the likelihood of a renegotiation. This was later expanded by Estache, Guasch, and Trujillo (2003), Guasch, Laffont, and Straub (2006), Guasch, Laffont, and Straub (2008), Guasch and Straub (2009), and Estache, Guasch, Iimi, and Trujillo (2009). Most of this research was aimed at understanding what the main determinants of renegotiation were. The authors intended to identify the variables that had the strongest impact on the probability of a certain concession being renegotiated. These articles take advantage of this previous Latin American data to investigate and approach unpublished renegotiation topics, respectively: efficiency and payoffs, government-led renegotiations, determinants of renegotiation, corruption, and so on.

The conclusions of this empirical body of knowledge have been fairly consistent. First, there is a strong evidence that the majority of PPP contracts tend to be renegotiated. Second, these renegotiations typically happen within the first years of contract, often still during the construction phase. Third, the main motives for these renegotiations were related to Government actions, either an explicit political change of the project or to compensate for insufficient and poor initial planning. However, most of the literature also presents the excessive optimism bias regarding revenue forecasts as being a relevant cause for renegotiations. This can happen because the government was too optimistic with the initial forecast (Roumboutsos & Pantelias, 2015) or because the private sector strategically overestimated the demand to win the contract (Liu, Gao, Cheah, & Luo, 2017). This phenomenon is known in the literature as “winner’s curse” (Iossa, 2015).

Apart from this empirical-based research, other studies have followed a theoretical approach, developing conceptual models for assessing the behavior of the parties engaged in contractual relationships. In fact, Guasch et al. (2006) built a theoretical model, with predictions that are consistent with the empirical results previously found in Guasch et al. (2003). Ho (2006) used a game theory-based model, to

investigate when and how government rescue a distressed project, through a renegotiation, and what were the impacts of the government’s rescue on PPP management and procurement. Engel, Fischer, and Galetovic (2006) use Chile’s case studies and present a model that offers a political economy explanation for renegotiations, arguing that these were used by incumbents to anticipate infrastructure spending, increasing their probability of winning upcoming elections. Table 12 provides an overview of the main determinants of renegotiations in the Latin American context.

Table 12. Determinants of PPP renegotiations in Latin America.^a

Type of determinant	Determinants	Impact on renegotiation probability	Authors
Exogenous	Better government efficiency and regulatory quality	Reduce	Guasch et al. (2003, 2007, 2008); Guasch & Straub (2009); Estache et al. (2009); Bitran et al. (2013)
	Better rule of law and less corruption	Reduce	Guasch et al. (2003, 2007, 2008); Guasch & Straub (2009); Estache et al. (2009); Bitran et al. (2013)
	Election period	Increase	Guasch et al. (2003, 2007, 2008); Guasch & Straub (2009); Bitran et al. (2013)
Endogenous	Increase in GDP growth	Reduce	Guasch et al. (2003, 2007, 2008); Guasch & Straub (2009)
	More investment	Increase	Guasch et al. (2003, 2007, 2008); Guasch (2004); Guasch & Straub (2009);
	Longer contract durations	Not significant	Guasch et al. (2003, 2008); Bitran et al. (2013)
	Government guarantees	Increase	Guasch et al. (2003, 2007)
	Transport sector	Increase	Guasch et al. (2003, 2007); Guasch & Straub (2009)

Notes: Gross Domestic Product (GDP); public–private partnership (PPP).

^a This table presents the main literature on the determinants of PPP renegotiations in the Latin American context.

Given this overview, it is understandable why most research addresses renegotiations as a problem, rather than an opportunity. As discussed by de Brux (2010), the ability to adapt the contract to new circumstances could be viewed as an opportunity to improve the contract performance for both parties. However, the reality shows that renegotiations are used opportunistically by both governments and concessionaires (Liu, Gao, Cheah, & Luo, 2016).

4.3 Methodology and Data

In this chapter, it is used the Brazilian experience in PPPs and contract renegotiations to look at the renegotiation motives and consequences from the Latin American experience. For this analysis, it was collect data from 42 PPP projects, from 2006 to 2016 (database was developed during 2017). These 42 projects covered all the PPPs that were developed during that period at the regional (State) level. From those 42 projects, it was found that a total of 27 had been renegotiated. These 27 projects (covering several sectors, such as transports, environment, health, etc.) are the ones included in our database. Table 13 provides an overview of the variables collected in our study. These variables were first collected through the analysis of publicly available information and were complemented with information provided by the regional PPP unit.

Table 13. Data collected for each concession

Type of variable	Variable	Description
General information	Name of project	Designation of the project, usually the name of the infrastructure
	Sector	Type of sector: transportation, health, security, environment, sports or housing
	State	Stage of the process: construction or operation
Concession	Data of establishment	Date of PPP contract signature
	Duration	Duration of the contract
	Investment	Initial forecasted investment
	Contracted payments	Payments due to concessionaire over the duration of the contract
	Demand risk	Demand risk is assumed by the public or private sector
Shareholders	Shareholders	Nature (national or international) of the shareholder
Renegotiations	Number of renegotiations	How many times has the contract been renegotiated
	Data of renegotiation	Official date to the change in the contract
	Motive	Identification of the motive(s) that triggered the renegotiation

For the construction of our database, it was first collected the original contracts of each PPP that was launched after 2004 (PPPs under the new Brazilian PPP law). After that, it was collected all the addendum (“termos aditivos”) of each contract. It was covered, for each contract, a period since the contract year and 2016. Therefore, all renegotiations that occurred during that period are included by our database. In each addendum, there was information about the motive(s) and the outcomes of the renegotiation.

After the construction of the database, the analysis included the number of PPP contracts and renegotiation events per State, as well as the average number of renegotiations per State, the number of PPP contracts renegotiated per sector, total investment, and duration. Next, the policy implications were analysed, considering the following: the number of PPP contracts and renegotiation events per year and the number of States governed by the right-wing political parties from the last four States’ elections. Furthermore, in the sequence, the contractors’ profile of the international and domestic shareholders interest in the Brazilian PPP contracts was compared. Finally, the following were presented: the description of the main renegotiations motives, the parties that caused the change or triggered by the other party, and the number of PPPs; the main motives for renegotiation by sector; the total of renegotiation motives per PPP contract and the renegotiated contracts with economic and financial re-equilibrium; and the percentage and average number of contracts renegotiated per State.

Despite some limitations concerning data, it was able to run some probit models to assess the probability of a renegotiation. In our model, each year (our dependent variable) is labeled as either renegotiation or no-renegotiation event year. It was tested the following independent variables: *ely* and *elylag*, assuming 1 for the election year and the year previous election (*lag*), respectively, and assuming 0 otherwise; *party* assuming 1 if the regional government is from the left wing and 0 if it is from the right wing; *natshar* assuming 1 if the main shareholders are domestic companies and 0 if the main shareholders are foreign companies; and *demand* assumes 1 if the demand risk was allocated to the private sector and 0 if it was allocated to the public sector. It was runned State (region), PPP (firm), and year fixed effects.

4.4 Results and discussion

Our results and the discussion are based on the 27 PPPs that were renegotiated from the total of 42 PPPs and are organized by sector, region (State), years, renegotiation motive, type of demand risk and shareholder, electoral cycles, and political parties.

4.4.1. Renegotiations per sector

The 27 PPPs renegotiated are from six sectors, namely, transportation (including metros, highways, etc.), environment (water and wastewater management), sports (essentially football stadiums developed for the 2014 World Cup), health (hospitals and diagnosing centers), security (prisons), and housing (social housing). Results show that the three sectors most renegotiated are transportation, environment, and sports with 58% (7 PPPs of 12), 70% (7 of 10), and 100% (6 of 6) renegotiated contracts, respectively. In the health, security, and housing sectors, the number of renegotiated contracts was 50% (the total number of projects was 8, 4, and 2, respectively). The sports sector involved six football stadiums, which were developed within a specific context the holding of the World Cup in Brazil. Even though the organization of the World Cup is a specific event, it was included these projects in the database because the literature has suggested that the typical problems with large-scale projects are not be that different from smaller scale projects (Flyvbjerg, 2014). Several delays and changes in the initial projects help to explain why all contracts in this sector were renegotiated. This sector's results are consistent with the ones found by Guasch (2004), Cruz and Marques (2013a, 2013b), and Miranda Sarmiento and Renneboog (2017).

Data on each PPP by sector are presented in Tables 14 and 15. The 27 PPPs that were renegotiated registered a total of 84 renegotiation events, with an average of 3.1 renegotiations per contract (with most renegotiations having occurred very early in the contract, the majority within 2 years after the contract was signed), within an interval of one renegotiation up to eight renegotiations (Project 7. Ribeirao Grande Prison). The security sector exhibits the highest average number of renegotiations per contract ("Renegotiations by type of shareholders"), which is essentially due to the project of Ribeirao Grande Prison. In this case, renegotiations can be explained by several factors: first, the PPP contract was signed in June 2009;

however, the financing for construction and implementation was only closed in February 2011. The motive was that the government required a change in the number of vacancies, resulting in the payment of a supplementary installment. Additionally, the first, fourth, and sixth renegotiation event was due to administrative delays of the Minas Gerais regional government. These renegotiations, requested by the concessionaire, resulted in the extension of the deadline for delivery and the updating of the construction schedule. The fifth and eighth renegotiation events were motivated by the need for corrections in the contract, such as change in the periods when the performance measurement system is supposed to be reviewed and the contract payment mechanism. In the seventh renegotiation event, a new service provision was the inclusion of, which resulted in a change in project design, which did not result in economic and financial re-equilibrium.

Table 14. Renegotiation events per sector

Panel A – Totals per sector

Sectors	Total of PPPs contracted	Total of PPPs renegotiated per sector	Total of renegotiations per sector	Percentage of PPPs renegotiated per sector	Average number of renegotiations per contract	Average time to the first renegotiation per sector (in years)	Average number of remaining years of contract
Transport	12	7	20	60%	2.9	2.4	28.6
Environment	10	7	21	70%	3.0	1.1	24.0
Sports	6	6	17	100%	2.8	1.2	26.3
Health	8	4	12	50%	3.0	0.5	15.7
Security	4	2	9	50%	4.5	1.5	30.3
Housing	2	1	5	50%	5.0	0.5	15.0
Total	42	27	84	60%	----	----	-----

Notes: Database was last revised on 9th of June 2017.

PPPs titles: 1. Fonte Nova Stadium; 2. Ocean Disposal System Jaguaribe; 3. Subúrbio Hospital; 4. Hospital Couto Maia Institute; 5. Salvador Metro; 6. Diagnostic Imaging of Bahia; 7. Ribeirão Prison; 8. Mineirão Stadium; 9. MG-50 Highway; 10. Rio Manso Producer System; 11. São Paulo Metro - Yellow Line; 12. Alto Tietê Producer System; 13. Rodovia Tamoios; 14. São Lourenço Producer System; 15. São Paulo Metro - Diamond Line; 16. Maracanã Stadium; 17. PR-323 Highway; 18. North Zone Hospital; 19. Castelão Stadium; 20. Mangueiral Housing Project; 21. Serra's Sanitary Sewage System; 22. Agreste Adductor System; 23. Sanitary Sewage of Recife; 24. Pernambuco Stadium; 25. Bridge of Praia do Paiva; 26. Itaitinga Prison; 27. Dunas Stadium.

Table 15. Renegotiation events per sector

Panel B – Data per PPP

Sectors	PPP's number	Total of renegotiations per PPP	Number of years until the first renegotiation	Contract duration (in years)	Average number of remaining years of contract
Transport	5	2	2	30	28.6
	9	6	1	25	
	11	5	1	32	
	13	1	3	30	
	15	1	5	20	
	17	2	1	30	
	25	3	4	33.5	
Environment	2	6	1	18	24.0
	10	5	1	15	
	12	2	2	15	
	14	1	1	25	
	21	2	1	30	
	22	1	2	30	
	23	4	0	35	
Sports	1	4	0	35	26.3
	8	4	1	27	
	16	1	1	35	
	19	2	2	8	
	24	4	0	33	
	27	2	3	20	
Health	3	4	0	10	15.7
	4	3	1	21.33	
	6	1	1	11.5	
	18	4	0	20	
Security	7	8	3	27	30.3
Housing	26	1	0	33.5	15.0
	20	5	0	15	
TOTAL		84			23.3

Notes: Database was last revised on 9th of June 2017.

PPPs titles: 1. Fonte Nova Stadium; 2. Ocean Disposal System Jaguaribe; 3. Subúrbio Hospital; 4. Hospital Couto Maia Institute; 5. Salvador Metro; 6. Diagnostic Imaging of Bahia; 7. Ribeirão Prison; 8. Mineirão Stadium; 9. MG-50 Highway; 10. Rio Manso Producer System; 11. São Paulo Metro - Yellow Line; 12. Alto Tietê Producer System; 13. Rodovia Tamoios; 14. São Lourenço Producer System; 15. São Paulo Metro - Diamond Line; 16. Maracanã Stadium; 17. PR-323 Highway; 18. North Zone Hospital; 19. Castelão Stadium; 20. Mangueiral Housing Project; 21. Serra's Sanitary Sewage System; 22. Agreste Adductor System; 23. Sanitary Sewage of Recife; 24. Pernambuco Stadium; 25. Bridge of Praia do Paiva; 26. Itaitinga Prison; 27. Dunas Stadium.

4.4.2. Renegotiation by Region (State)

These 27 PPPs which were renegotiated are located in 13 States. Data of renegotiations by State are summarized in Table 16. The highest number of PPPs is concentrated in four States: Bahia, São Paulo, Minas Gerais, and Pernambuco. As expected, these States have the highest number of contracts renegotiated, with six, five, and four contracts being renegotiated. These same States, including the State of Ceará, represent almost three-quarters of the number of PPPs contracted. The same four States also lead the number of renegotiation events; however, the order changes to Minas Gerais, Bahia, Pernambuco, and São Paulo, with, 23, 20, 12, and 10 events, respectively. With the exception of the State of Goiás, the other States have at least one renegotiation event each, with Distrito Federal leading this group, with five renegotiation events. The States of Bahia, Pernambuco, Rio de Janeiro, Paraná, and Rio Grande do Norte had 100% of their PPPs renegotiated. The States of São Paulo, Minas Gerais, Espírito Santo, and Alagoas renegotiated just under half of their contracts, while the States of Amazonas, Ceará, and Federal District had only one contract renegotiated.

Table 16. Renegotiation events per state

State	PPP's number	Number of renegotiations events	Total of renegotiations events per State	Percentage of the total of renegotiation events	Average number of renegotiations per State	Number of years until the first renegotiation	Average time to the first renegotiation per state
Minas Gerais	1	8	23	28%	5.8	3	1.5
	2	4				1	
	3	6				1	
	4	5				1	
Bahia	5	4	20	24%	3.3	0	0.8
	6	6				1	
	7	4				0	
	8	3				1	
	9	2				2	
	10	1				1	
Pernambuco	11	4	12	14%	3.0	0	1
	12	4				0	
	13	3				4	
	14	1				0	
São Paulo	15	5	10	12%	2.0	1	2.4
	16	2				2	
	17	1				3	
	18	1				1	
	19	1				5	
Distrito Federal	20	5	5	5%	5.0	0	0
Amazonas	21	4	4	4%	4.0	0	0
Ceará	22	2	2	2%	2.0	2	2
Espírito Santo	23	2	2	2%	2.0	1	1
Paraná	24	2	2	2%	2.0	1	1
Rio G. do Norte	25	2	2	2%	2.0	3	3
Rio de Janeiro	26	1	1	1%	1.0	1	1
Alagoas	27	1	1	1%	1.0	2	2
Total	27	84	84	-	-	-	1.3
State's Average number of renegotiations	-	-	-	-	3.0	-	-

Notes: Database was last revised on 9th of June 2017.

Among the 27 States in Brazil, 13 contracted PPPs and 12 renegotiated PPP contracts. This means that, with the exception of the State of Goiás, the rest of the Brazilian States have already contracted PPPs, with at least one PPP renegotiated. Considering the number of PPPs renegotiated versus the amount of renegotiation events, the States of Minas Gerais, Distrito Federal, Amazonas, Bahia, and Pernambuco have the highest average number of renegotiation events (Table 16). The other five States (Ceará, Espírito Santo, Paraná, Rio Grande do Norte, and São Paulo) have two renegotiation events per PPP contract. The States of Alagoas and Rio de Janeiro have only one renegotiation event per contract. Although the State of Minas Gerais is the third in terms of the number of renegotiated contracts and has the highest average of renegotiation events, the States with only one contract (Amazonas and Federal District) have a larger number of renegotiation events, placing them in second and third place in this ranking. These results may indicate different interpretations. On the one hand, more experienced PPP units are able to identify problems that exist in contracts, leading to a renegotiation. However, on the other hand, an experienced PPP unit that is involved in the project from the start can help to mitigate potential contractual flaws.

4.4.3. Renegotiation by year and motives

The number of renegotiation events per year has been increasing up to 2014. This result is to be expected for two reasons. First, the number of PPP in operation is increasing and, therefore, more projects are prone to renegotiation; and, second, with the temporal evolution of the project, it is more likely that the project will be renegotiated. Figure 18 presents the annual evolution of PPP projects and the number of annual renegotiations. Figure 19 presents the accumulated PPPs renegotiated and the total number of contracts in each year. It can be seen that up to 2014 around 60% of the total PPPs were renegotiated. The number increases up to 80% and 90% in 2014 and 2015, respectively, reaching the total subsample in the last year (2016).

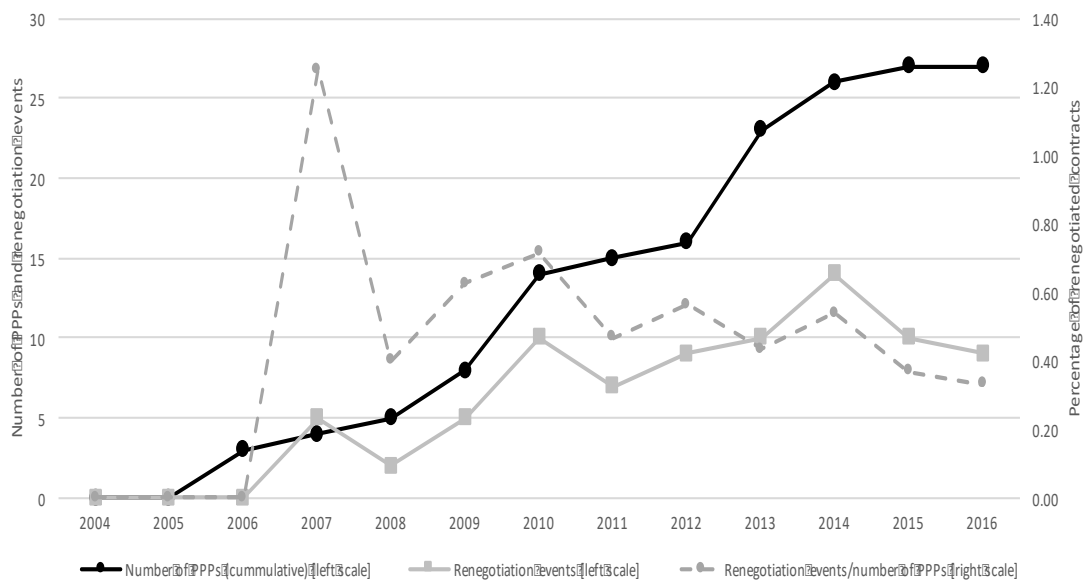


Figure 18. PPPs and renegotiation events per year

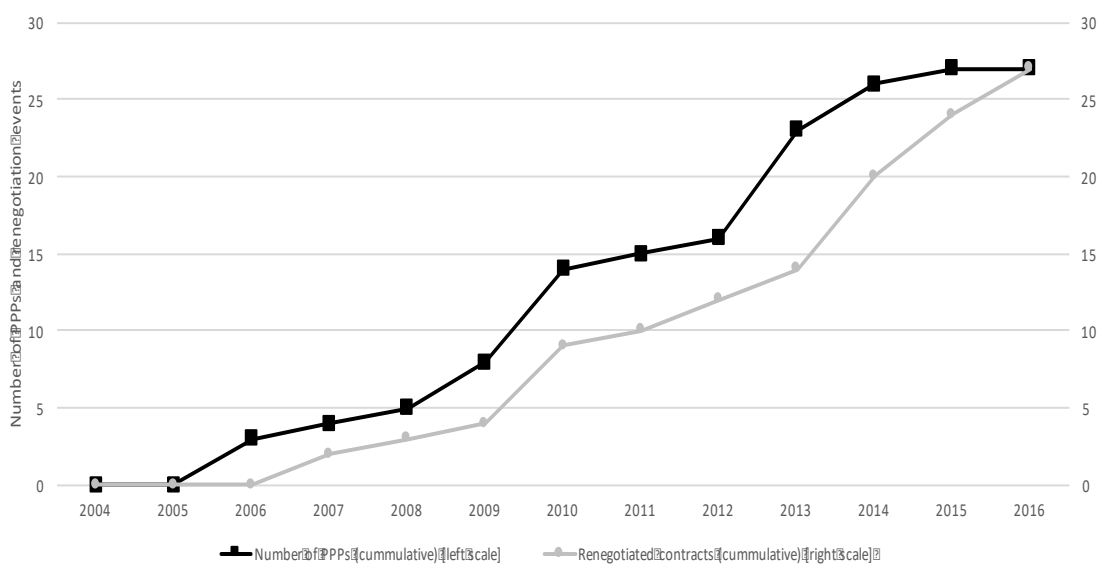


Figure 19. PPPs and renegotiated contracts per year

Motives (i.e. the motive that triggered the renegotiation event) are perceived in the literature, as discussed previously, as being a critical aspect in renegotiations. Table 17 presents the number of renegotiations per each motive, while Table 18 presents a more detailed perspective of the motives versus sectors for each project. Table 17 summarizes a total of 12 motives (one renegotiation can have more than one motive), providing a short description of what is involved in each motive and presents the party (public and/or private sector) that triggered the renegotiation and the total number of renegotiations caused by each motive.

Table 17. Renegotiation motives

Motives	Summary description	Responsible for triggering the renegotiation	Total per motives
Change in project design	Change in the scope of the contract. Government created new services to be implemented or eliminated some services.	Private/Public	20
Change in project features	The grantor agency (Government) changed its requirements about projects features, for technical or political purpose. The private partner would also suggest a different technical solution to improve the project cost/performance.	Private/Public	9
Additional work	Additional investment (cost). Government decided (or Private partner claimed) an increment in the number of the same works and/or services provided.	Public/Private	8
Tax benefits	Adequacy of the Contract to the tax benefits offered by the government.	Public/Private	4
Administrative delays	Extension of the deadlines for the realization of the investments and/or operational activities, due to Government (or agencies) administrative delays.	Private	3
Review of previous term	Government publishes additive term, reviewing clauses and/or previous term.	Public	3
Analysis of contract terms	Interruption of the contract until the government completes the technical analysis and economic/ financial feasibility of the project.	Public	3
Delay in expropriation	The delay or non-expropriation of land.	Private	3
Transfer of corporate control	The concessionaire transfers its interest to third parties.	Private	2
Change in the risk matrix	Reduction of the contractual guarantees of the Government, in case scenario occurs that brings financial damage to the private partner.	Private	2
Force majeure	Private partner requests contract extension, due to equipment breakdown, strike of employees, or events outside the will of the parties.	Private	1
Specific legal changes	The private partner requests the correction of the calculation formula of the instalments, due to the alteration of some legislation, which impacts its financial results in the contract.	Private	1
Corrections in the contract	Inclusion or exclusion of clauses in the contract, which do not create contingencies, obligations or financial commitments.	Private/Public	39
Total			98

This table presents the main renegotiations motives, related description, parties that cause the change, triggered by the other party, and number of PPPs. In some cases, the process of renegotiation was due to more than one reason; Database was last revised on 3rd of August 2017.

The dominant motives are changes in the project design. This happens when the government imposes a change in the initial project design because it changed the amount and type of services and/or the infrastructure initially contracted. As an example, in the PPP of the Mineirão Stadium (Minas Gerais), the last two renegotiations were triggered for the same motive (change in the project design), but for opposite reasons. In one, the government decided to create new obligations for the concessionary, related to the installation of temporary structures for the FIFA Confederations Cup 2013, whereas in the other renegotiation, the parties agreed on the reduction of the contracted object, redefining the territorial and spatial scope of the concession.

The second motive is similar and was designated “change in project features.” In this case, there is no increase or decrease on the type or quantities of services, but rather a change in the technology or technical requirements of the project, which might have an effect on costs. One example is the PPP of the Rio Manso Producer System (São Paulo), where the concessionaire developed a project for the collection unit that allowed the introduction of operational improvements with a greater efficiency than the initially proposed project. The third most relevant motive is also related to changes in the project and concerns the government’s request for increasing the amount of service/infrastructure contracted. There are no changes in the type of work or the technology but just an increase in the amount.

These first three motives are all related to the same overall problem: poor initial planning. This also helps to explain why the average time for the first renegotiation is so short within the first 3 years. In fact, after the contract is formally established, when the detailed project design is executed and/or the construction begins, it becomes necessary to adjust the project. This also shows that the Government changes the initial assumptions regarding the volume of services and/or infrastructure to be provided, which reflects one of two possibilities: either the project is poorly planned or the change in political decision makers creates different views and perspectives of the objectives of the project, forcing a readjustment.

The fourth motive is renegotiation due to “tax benefits.” The government requested the renegotiation of the contract to allow for the introduction of tax benefits in the

contract, which would improve the economic performance of the contract. It is somehow bizarre to see the public sector requesting a renegotiation that would result in a benefit for the private sector without any apparent benefit for the government. Our understanding is that in the cases when this occurred, this was probably a way of avoiding a posterior claim for renegotiation by the private sector, due to unknown reasons. By introducing the tax benefits, the government enabled a cost saving for the concessionaire, thus improving its profitability and avoiding public payments in the future.

Several motives exist, such as administrative delays, administrative reviews of the terms of reference, interruption of contracts (suspension for a certain period), delays in expropriations, and so on. It is important to notice that several of these motives exhibit a poor control by Brazilian public authorities. As an example, while some renegotiations included a typical economic and financial re-equilibrium, recalculating costs, revenues, and expected profitability, others have not involved any economic recalculation. This raises several questions: What was the impact of the renegotiation? Did the renegotiation affect the expected profitability of the concessionaire? What was the impact in terms of future payments for the government? There is clear evidence of a lack of structured renegotiation, in the sense that the motives are clearly identified, the objectives of the renegotiation are clearly stated, and the financial impacts of the renegotiation are quantified. In many of these renegotiations, this approach is missing (Table 18).

Table 18. PPPs renegotiated per State by sector and main motives for renegotiation

State	PPP's number	Sectors						Motives													Total of motives per PPP	Renegotiation with econ. - financial equilibrium		
		Envir onmental	Transport	Sports	Health	Prison	Housing	1	2	3	4	5	6	7	8	9	10	11	12	13				
Bahia	1			X				2*			1									3	6	2		
	2	X							1*				3		1		1				6	1		
	3				X					1*		1									2	4	1	
	4				X			1*				1				1						3	1	
	5		X					1+1*	1+1*	1					1							2	8	2
	6				X			1*	1*													1	3	2
Minas Gerais	7					X		1		2*	1										4	8	2	
	8			X				1+1*														2	1	
	9		X						1*	1*				1*							5	8	3	
	10	X						1*	1	1*								1			2	6	2	
São Paulo	11		X					3													3	6	0	
	12	X																				(**)	(**)	
	13		X																		1	1	0	
	14	X																			1	1	0	
	15		X					1*													1	2	1	
Rio de Janeiro	16			X				1														1	0	
Paraná	17		X																		2	2	0	
Amazonas	18				X																	(***)	(***)	
Ceará	19			X						1*											1	2	1	
Distrito Federal	20					X	1*	1*	1*			1*									2	6	4	
Espírito Santo	21	X																			2	2	0	
Alagoas	22	X					1*	1*	1*												1	4	3	
Pernambuco	23	X					1+1*					1									2	5	1	
	24			X							1+1*					2						4	1	
	25		X				1	1				1			1						3	7	0	
	26					X															1	1	0	
Rio G. do Norte	27			X																		(***)	(***)	
Total of contracts	27	7	7	6	4	2	1																	
Total of motives								20	9	8	4	3	3	3	3	2	2	1	1	39	98	-		

**Renegotiation
econ. -financial
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(*)**

11 6 7 2 0 1 0 1 0 0 0 0 0 - 28

Notes: In some cases, the renegotiation event was due to more than one reason; Database was last revised on 9th of June 2017; Renegotiation with economic and financial re-equilibrium (*); The motives were not described in the additive terms (**); The government agency responsible for the project did not provide the renegotiations terms (***)

PPPs titles: 1. Fonte Nova Stadium; 2. Ocean Disposal System Jaguaribe; 3. Subúrbio Hospital; 4. Hospital Couto Maia Institute; 5. Salvador Metro; 6. Diagnostic Imaging of Bahia; 7. Ribeirão Prison; 8. Mineirão Stadium; 9. MG-50 Highway; 10. Rio Manso Producer System; 11. São Paulo Metro - Yellow Line; 12. Alto Tietê Producer System; 13. Rodovia Tamoios; 14. São Lourenço Producer System; 15. São Paulo Metro - Diamond Line; 16. Maracanã Stadium; 17. PR-323 Highway; 18. North Zone Hospital; 19. Castelão Stadium; 20. Mangueiral Housing Project; 21. Serra's Sanitary Sewage System; 22. Agreste Adductor System; 23. Sanitary Sewage of Recife; 24. Pernambuco Stadium; 25. Bridge of Praia do Paiva; 26. Itaitinga Prison; 27. Dunas Station.

Renegotiation motives: 1 - Change in project design, 2 - Change in project features; 3 - Additional work; 4 - Tax benefits, 5 - Administrative delays, 6 - Review of previous term, 7 - Analysis of contract terms, 8 - Delay in expropriation, 9 - Transfer of corporate control, 10 - Change in the risk matrix (change in the risk allocation); 11- Force majeure, 12 - Specific legal changes, 13 - Corrections in the contract.

4.4.4. Renegotiations by demand risk

Demand risk is one of the largest risks (or maybe the core risk) in PPP projects, despite the fact that authors tend to consider the allocation of demand risk in PPP projects as being very complex (see, for instance, Meda, 2007). In these projects, demand risk was classified as being allocated for the concessionaire (e.g. tolls in a highway or water consumption revenues in a water project) or being allocated to the public sector. In the latter case, payments are usually on an “availability” base. In these cases, the public sector remunerates the concessionaire for the availability of the infrastructure, but the concessionaire is immune to any variation of the levels of utilization of the infrastructure. Roads, hospitals, or prisons are all examples of projects where this remuneration model is frequently used. In the Brazilian PPP context, the allocation of demand risk is determined in each project by the government, being part of the conditions for the tender process. Therefore, the private sector, when participating in the bidding, is accepting the allocation of demand risk.

In this section, it is analysed the relationship between renegotiations and demand risk (Table 19). Projects where demand risk is allocated to private sector should be prone to more renegotiations. If the demand is below the forecast, then the concession will enter into financial distress and the concessionaire will be more willing to ask for potential renegotiations. It appears to be no significant difference between the average number of renegotiations when the private sector holds the demand risk (3.16 renegotiations per contract, on average), when compared with the cases when the public sector retains the risk (3.09). However, these results must be analysed by considering that in our sample, there is a much higher number of projects with demand risk being on the public sector (21), compared with demand risk on the private sector (6). There seems to be a perception that the private sector may not be willing to hold the demand risk. Tackling demand risk involves a mature market and a relative level of stability in terms of public policies, in order that the private sector may have robust demand forecasts and, therefore, be willing to take that risk. Our econometric model may confirm these results later.

Table 19. Renegotiations per type of demand risk

State	PPP's number	Number of renegotiations events	Public sector holds the risk of demand	Private sector holds the risk of demand	
Bahia	1	4	X		
	2	6	X		
	3	4	X		
	4	3	X		
	5	2		X	
	6	1	X		
Minas Gerais	7	8	X		
	8	4	X		
	9	6		X	
	10	5	X		
São Paulo	11	5		X	
	12	2	X		
	13	1		X	
	14	1	X		
	15	1	X		
Rio de Janeiro	16	1	X		
Paraná	17	2		X	
Amazonas	18	4	X		
Ceará	19	2	X		
Distrito Federal	20	5	X		
Espírito Santo	21	2	X		
Alagoas	22	1	X		
	Pernambuco	23	4	X	
		24	4	X	
		25	3		X
	26	1	X		
Rio G. do Norte	27	2	X		
Total	27	84	21	6	
Average number of renegotiations	-	3.11	3.09	3.16	

4.4.5. Renegotiations by type of shareholders

PPP shareholders (domestic or foreign) and their political connections can impact on the occurrence of renegotiations. Hong and Kostovetsky (2012) present the case of “red” and “blue” USA firms—firms with Democratic or Republican ties. Miranda Sarmiento and Renneboog (2017) show that foreign firms can renegotiate more. The motives are that foreign companies may not be concerned about domestic market and reputational risks as much as domestic firms. However, domestic firms may be politically better connected and can use such influence to renegotiate PPP contracts.

Table 20 shows our data per PPP, in terms of domestic or international bidding. Of the 27 PPPs analysed, 15 are controlled by domestic shareholders, and 12 by foreign

shareholders. From the total of 81 renegotiation events, the number of renegotiations in PPPs controlled by domestic shareholders amounts to 51 events (Table 21). PPPs controlled by foreign shareholders account for 30 events. This means that there is a prevalence of PPPs controlled by domestic shareholders, with an average of 3.4 renegotiation events per PPP, with, in contrast, an average of 2.5 events for PPPs of foreign shareholders. This is particularly true for Odebrecht, the best politically well-connected Brazilian firm, which is responsible for 9 PPPs (one-third), but is responsible for almost half of the 81 renegotiation events (34 events). It will be looked again for this in our econometric results subsection.

Table 20. Renegotiations per type of shareholder: type of shareholder per PPP

State	PPP's number	Bidding only for national shareholders	Open bidding for international shareholders	Change of shareholders	Independent Verifier audit	Number of years until the first renegotiation
Bahia	1		X		X	0
	2	X		X	X	1
	3		X			0
	4	X		X	X	1
	5	X			X	2
	6		X		X	1
Minas Gerais	7		X		X	3
	8	X				1
	9	X				1
	10		X			1
São Paulo	11		X			1
	12		X			2
	13		X			3
	14		X			1
	15		X			5
Rio de Janeiro	16	X				1
Paraná	17	X				1
Amazonas	18		X			0
Ceará	19		X			2
Distrito Federal	20	X				0
Espírito Santo	21		X		X	1
Alagoas	22		X			2
Pernambuco	23	X			X	0
	24	X			X	0
	25	X			X	4
	26	X			X	0
Rio G. do Norte	27				X	3
Total	27	12	15	2	12	-
Average time to the first renegotiation	-	-	-	-	-	1.37

Table 21. Renegotiations per type of shareholder: renegotiations by type of shareholders

	Domestic shareholder	Foreign shareholder
Nº of PPPs (total: 27)	15	12
Nº of renegotiations (total: 81)	51	30
Average renegotiation per PPP	3.4	2.5

4.4.6. Renegotiations by electoral cycle and political party

Previous results show (as also described in the renegotiations literature) that there has been a significant interference by political decision makers on changes made to the projects. It is intended to analyse whether there is any political bias in the changes made to these projects. This means that whether in the proximity of elections, or after elections (the electoral cycle, as Brazilian elections at regional level occur every 4 years), there is a higher number of renegotiations which might provide evidence that these renegotiations are more politically driven, rather than just technically motivated, or whether the political party in government at the regional level can impact on the occurrence of renegotiations. Table 22 summarizes the data on renegotiations and electoral cycles, and Tables 23 and 24 summarize the data on renegotiations and political parties.

Table 22. Renegotiations during the years of government

Event	Year	PPPs contracted	Renegotiations
	2003	-	-
First year of government (3 PPPs contracted - 11%) (22 renegotiations - 26%)	2007	1	5
	2011	1	7
	2015	1	10
	2004	0	0
Second year of government (2 PPPs contracted - 7%) (20 renegotiations - 24%)	2008	1	2
	2012	1	9
	2016	0	9
	2005	0	0
Year before election year (10 PPPs contracted - 37%) (18 renegotiations - 21%)	2009	3	5
	2013	7	10
	2017	0	3
	2006	3	0
Election year (12 PPPs contracted - 44%) (24 renegotiations - 29%)	2010	6	10
	2014	3	14
	2018	-	-
Total		27	84

As mentioned previously, the electoral years (except for 2014) were the years with the greatest number of projects contracted. This shows that the launch of PPPs is conditioned by the electoral cycle. There is some evidence that renegotiations tend to occur before or during elections. More than 50% of the renegotiation events are concentrated in these 2 years. The 2009–2010 electoral period alone accounted for a total of 15 renegotiation events and the electoral period of 2013–2014 a total of 24 renegotiation events. There seems to be a tendency to contract during electoral years (or the year before the election) or to celebrate renegotiate contracts during the last year of government (or during the first year of a new government).

Regarding the political status of the party in those States that renegotiated PPP contracts, it can be seen the presence of three political parties in Tables 23 and 24: right, left, and others (Centre). Rightwing political parties are the mandates of those elected State governors that belonged to the Partido da Social Democracia Brasileira (PSDB; “Brazilian Social Democracy Party”) or those political parties were allied to the PSDB. The left-wing political parties are the mandates of State governors that belonged to the Partido dos Trabalhadores (PT; “Workers’ Party”), or the political parties that were allied to the PT. Finally, the Centre parties are the mandates of

those elected State governors that belonged to the other parties that were not allied to the PT. This classification took into consideration that the last four elections for President of the Republic of Brazil were won by the PT, a major party of reference of the left wing in the country. The results show that, from 2002 to 2014, only the number of mandates from the left wing increased, while the number of mandates from the Centre only decreased. In 2002, the Centre parties totaled seven State governments. In 2006, this number dropped to five, in 2010 to four, and in 2014 to only one State government. Whereas right-wing governments often have stronger ties with the private sector, this is not reflected in our data, as each political party seems to renegotiate as often as the other side.

It is possible to see that political cycles impact on renegotiations. First, tight public budgets typically encourage the public sector to pass on large investment obligations to the private sector, possibly with governmental guarantees (which could lead to the private sector behaving opportunistically, seeking additional rents). Elections can lead to governments being more generous and to invest more in infrastructures. Incumbent governments invest or renegotiate in order to guarantee reelection, and newly elected officials may renegotiate from a political ideological perspective, to meet social demands in a way different from the past.

Table 23. Number of State mandates per type of political party

Panel A – Mandates by political party

Election Year	2002	2006	2010	2014
Years of government mandate	1st of January of 2003 to 31th of December, 2006	1st of January of 2007 to 31th of December, 2010	1st of January of 2011 to 31th of December, 2014	1st of January of 2015 to 31th of December, 2018
Right-wing political party state mandates	5	4	4	6
Left-wing political party state mandates	0	3	4	5
Other political party State mandates	7	5	4	1

Table 24. Number of State mandates per type of political party

Panel B – Number of renegotiations by political party

	Left-wing party	Non-left-wing party (Centre or right-wing party)
Nº Renegotiations	34	47

4.4.7. Econometric analysis

In order to assess the impact on the probability of a renegotiation event of the main variables of this study, it was runned a probit model, with results presented in Table 25. It can confirm that left-wing parties tend to renegotiate more frequently. Also, allocating the demand risk to the private sector, as it increases uncertainty, tends to increase the likelihood of renegotiations. Also, political connections from the national shareholders tend to increase the probability of a renegotiation. Results from the electoral cycle are not conclusive.

Table 25. Results from the probit model^b

VARIABLES	(1) reneg
Ely	0.61 (0.45)
Elylag	0.13 (0.44)
Party	-1.12** (0.50)
Natshar	0.49** (0.80)
Demand	1.98** (0.77)
Year effects	Yes
Firm effects	Yes
State effects	Yes
Constant	0.05 (0.70)
Observations	129

^bThis table shows the marginal effects of a random effects probit model with the renegotiation/no-renegotiation event as dependent variable. State effects mean fixed effects at the regional (State) level. Firm effects mean fixed effects at the PPP project level. Robust standard errors in parentheses.

*p < 0.1.

**p < 0.05.

***p < 0.01.

4.5. Policy implications

The results from the previous section provide us with some insights, which can be used to draw policy implications from this research. There is some evidence that PPPs in Brazil also tend to renegotiate too often and too soon. In fact, most of the PPPs launched in Brazil during the last 15 years have been renegotiated, and usually more than once. Furthermore, most renegotiation of PPPs occurred during the first years of the contract. This shows that the main concerns of literature regarding PPP renegotiations (the abnormal frequency of renegotiations events and the occurrence of such events in the early stages of the projects) are also present in the Brazilian experience. Additionally, the increase in the number of PPPs and the passage of time of each contract is increasing the occurrence of renegotiation events, as expected.

Changes in projects and delays in administrative procedures are one of the main problems in PPP renegotiations. This was also the case for these PPP projects under study, particularly with the occurrence of a mega event, such as the World Cup. The first policy implication is that our analysis shows strong weakness in planning. Therefore, the public sector in Brazil, at the State level, needs to reinforce the public administration capacities for the planning, bidding, and monitoring stages. The best approach to improve planning capacity is to ensure that all projects are conveniently evaluated and monitored by an independent body. The PPP units could have this function, but there seems to be too much political interference in the PPP units. These are administratively and financially dependent on the elected official. It is believed that is crucial to have an independent technical body to decrease the political bias towards project evaluation and, also, to monitor renegotiations.

The second policy implication is that renegotiations of PPPs seem to be a problem across States, showing that they share a common weakness, such as the lack of capacities mentioned above and the institutional framework for PPPs contracts. There is a need for each State to implement and improve a PPP unit. However, there is also scope for better inter-State cooperation in terms of skills and experiences. PPPs' institutional framework in Brazil should also be reviewed, in order to address potential problems at State level. The pitfalls presented may reflect a lack of

legal/technical ability and foresight on the part of the executive public entities, and the prevalence of asymmetric information in the case of the public sector. The best practices in PPPs (OECD, 2010) provide evidence for our second policy implication: the need for PPP units in each region. There is also a role for a regional level Court of Audits to play, as these entities usually play a very important part in the PPP process, increasing accountability and transparency and providing better practices. Additionally, the public sector, based on a PPP unit, needs to increase access to data and information regarding each project.

The third implication regards the fiscal context. Brazilian public authorities need to avoid the use of PPPs for an “off-budget” motive. They also need to address renegotiation motives that are related to postponing expenditures. A reinforcement of the fiscal rules for PPPs could avoid future renegotiations.

The fourth policy implication is that, due to the impact of electoral cycles on the occurrence of renegotiations events, there is also a need for renegotiations to be carried out, or at least evaluated, by an independent authority, where political influence is minimized as much as possible.

Finally, the fifth policy implication regards political connections, for in a country such as Brazil, this issue is a major problem. A ban on conflicts of interests by former politicians (and by extension, those with experience in the relevant ministries) ought to be introduced, even if the political ties had been established in the past.

4.6. Partial conclusions

This chapter presents the Brazilian experience of PPPs and renegotiations at the State (region) level. Our research shows evidence that, similar to other PPP experiences, Brazil has also suffered from an abnormal number of renegotiation events, together with the first renegotiation event occurring after a short period of the start of the contract. Furthermore, as the number of PPP projects increases (and as time passes for each contract), renegotiation events occur more often, increasing the problem. All States and all sectors that have PPP projects seem to be affected by

this phenomenon. The motives are mainly on the public side, such as failures in the planning and concept of projects. Electoral periods and the political connections of shareholders have a significant impact on renegotiations. Results for the political party, national shareholders, and allocation of the demand risk to the private sector show an increase in the likelihood of renegotiation. It is drawn several policy implications in our chapter.

This work has some limitations, however. Notably, there is a small period in analyse and a small sample of PPPs and renegotiation events. This has created some difficulties and does not enable us to provide a more robust econometric analyse. Future work on the renegotiation of PPPs in Brazil is much needed, particularly as the country is planning hundreds of new projects. More data on a broad set of PPPs, covering a broader period, would provide more robust results and deeper conclusions.

Chapter 5. Renegotiation determinants and consequences

5.1 Introduction⁵

Over the last decades, the private sector has become a key player in developing and operating transport infrastructures and services (Berechman et al., 2006; Roumboustos, 2015). This is the result of the government's need to attract private financing and expertise, particularly through concessions and PPPs (Chen & Gifford, 2017; Button, 2016). The provision of public services under concession agreements is becoming an increasing area of business opportunity for the private sector, although there should be a clear alignment of objectives between the parties, in order to ensure the success of PPP projects (Tsamboulas et al., 2013).

There is a lack of consensus for the definition of PPPs (Miranda Sarmiento & Renneboog, 2016), however there is a broad and general definition from the OECD (2008, pg. 17), which defines PPPs as; “an agreement between the government and one or more private partners (which may include the operators and the financiers) according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners”.

One of the main (problematic) issues with PPPs is their frequent renegotiation, which can arise at any stage during the lifecycle of a PPP (see Miranda Sarmiento & Renneboog (2016) for details on how a PPP is managed). PPP renegotiation occurs when specific events change the financial conditions of the concession, which mainly occurs when the public authority is asked, or proposes to compensate the firm managing the project for loss of revenue or un-anticipated costs. Alternatively, renegotiation can be initiated by the private sector; this is mainly the case when the concession's financial conditions deteriorate in such a way that the private company may fall into financial distress.

With regards the context of PPPs renegotiation, the seminal work is from Guasch, Laffont & Straub (2003) (which they subsequently expanded into several papers:

⁵ The content of this chapter is written in the paper “Renegotiation of Transport Public Private Partnerships: Policy implications of the Brazilian experience in the Latin American context”, submitted in the Case Studies on Transport Policy.

Guasch, 2004; Guasch et al., 2007, 2008; Guasch & Straub, 2006, 2009), using the Latin American experience, with over 1,000 concessions. The Latin American experience was also analysed in other studies (Estache, Guasch & Trujillo, 2003, 2009; Bitran, Nieto-Parra & Robledo, 2013; Moore, Straub & Dethier (2014)) Despite more recent studies covering transport PPPs renegotiation in Europe (Domingues & Sarmiento, 2016), France (De Brux, 2010) and Portugal (Cruz & Marques, 2013; Miranda Sarmiento & Renneboog, 2017), the Latin American context remains the most relevant in terms of analyzing the main determinants of PPPs renegotiation.

Those authors who have analysed the Latin American experience in PPPs renegotiation found that a stronger institutional, political, and legal environment, which provides contractual security, reduces the probability of future renegotiation, whereas an increase in the level of corruption, elections, and change of government, or the need for greater follow-up investments all tend to increase the likelihood of renegotiation.

In this chapter it is used the Brazilian PPPs experience in renegotiation in the transport sector. Brazil is one of Latin-American countries with a larger PPP program and has been actively engaged in developing PPP programs. Understanding the patterns of PPP renegotiations in Brazil can provide valuable policy implications for Latin American countries, but also for developing economies. Our sample covers seven PPPs projects for a total of 20 renegotiation events, from 2006 to 2016. First, it is compared the Brazilian experience with the previous literature on the Latin American experience of PPPs renegotiations. Second, it is discussed and explore which are the critical factors for the renegotiation of transport contracts in the Brazilian context.

There is evidence of a large number of renegotiation of PPPs in Brazil, with potential negative effects for the public interest. It was found evidence of political influence on the likelihood of renegotiation and, as expected, the project uncertainty factor also plays an important role. This chapter is relevant for academics and practitioners in the transport field, as it presents an important experience in a developing country. Brazil's experience can provide a strong case for building policy

recommendations in developing countries, where the number of PPPs is expected to grow in the medium and long term.

This chapter is organized as follow: Section 5.2 presents an overview of PPPs and renegotiation, focusing on the previous literature regarding the Latin American experience. Data and methodology are presented in Section 5.3, and the Brazilian PPP experience in transport in Section 5.4. Results are presented and discussed in Section 5.5. Policy implications and Conclusions are described in Section 5.6 and 5.7, respectively.

5.2 PPPs, renegotiations and the Latin American context

A PPP renegotiation can be defined as a revision of the concession contract that affects and alters the financial balance of the firm managing the project (Guasch et al., 2007). However, changes preview in the contract, such as tariff increases or adjustments due to inflation should not be considered under the scope of this definition. Only substantial departures from the original contract are perceived as being renegotiation.

PPPs are long and incomplete contracts, involving a large investment, and are usually in heavily-regulated sectors that are sensitive to political and circumstantial changes. All this leads to a high level of uncertainty. Therefore, some authors have been arguing that renegotiation could be perceived as being a natural and typical aspect of the PPP process (Engel et al., 2009). They can be used to address inefficiencies from contract incompleteness and to improve initial forecasts and plans. However, the majority of authors view a high frequency of renegotiation events as an indication of PPP failure, usually leading to an increase in public payments, an increase of the users' costs, or a reduction of service (or any combination) (Guasch, 2004). Frequent PPP renegotiation ought to be avoided, and should it occur, then it should only be a response to financial distress or lack of efficiency (Guasch & Straub, 2006). Renegotiation is considered to be one of the pitfalls of PPPs, for two reasons: the abnormal frequency of renegotiation (especially soon after a PPP has been awarded) (Schwartz, Corbacho & Funke, 2008), and also

the fact that they are viewed as being a source of distress in the efficiency of PPPs (Guasch & Straub, 2006).

Latin America is still the main experience for the study of PPPs and concession renegotiation. Unlike contract renegotiation theory (e.g., Grossman (1986); Williamson (1989); Tirole (1999); Hart (1990, 2003)), the literature on PPPs (and particularly on renegotiation) is not abundant, as private firms rarely share information regarding their agreements, and are even more unlikely to share information about their renegotiation decisions and their outcomes. The relevance of the Latin American experience also arises from the fact that PPPs renegotiation has been more frequent than theory or international experience would predict (Bitran, 2013). Studies originate from Guasch's research, as mentioned previously. However, other studies of the Latin American experience of PPPs renegotiation were carried out by: Engel et al. (2003) on highway privatization in Latin America; Estache et al. (2009) on price cap efficiency; Moore et al. (2014) on the impact of capital structure on renegotiations; and Bitran et al. (2013), based on the experience of Chile, Colombia and Peru.

Guasch's work found that a high level of PPPs had renegotiated their contracts at least once. In the specific case of transport, it was found that 55% of all PPPs were renegotiated. This is a higher incidence than the average renegotiation (30%), and is considerably greater than other sectors, such as electricity and telecommunications. PPPs in transport were only renegotiated less than PPPs in water and sanitation sector. This could be the result of different degrees of competition and regulation, as in most cases, the transport projects were operating in a low competition environment (the operator usually being the only one available to users). Renegotiation of transport concessions occurred after an average of 3.1 years, with 60% of renegotiations occurring within the first 3 years of a concession, and 85% within the first four years. The private sector demanded renegotiations in transport PPPs 57% of the time (with the Government asking for renegotiation 27% of the time, and with 16% of renegotiations initiated by both sectors).

More recently, Guasch et al. (2014) expand their analyses of the Latin American experience. The incidence of renegotiated contracts in the transport sector is over

75% of all contracts. In several road PPPs projects, the repetition of renegotiation events was significant. The authors also found that 78% of PPP contracts for transport infrastructure in Latin America were renegotiated fairly quickly after the signing of the contract (3.1 years). Furthermore, results from Bitran (2014) come from the same direction. These authors also found that almost all PPPs were renegotiated. Renegotiation also occurred in most of cases during the first three years of a project.

Renegotiation in the Latin American context provided several outcomes. The most common were: delay/reduction in investment; tariff increases, and; extension of the contract period or direct (annual or lump-sum) compensations paid to the private operator (Guasch, 2004). Bitran et al. (2013) also found evidence of direct fiscal costs, higher toll prices, and risks being allocated to the public sector. On the other hand, renegotiations costs tend to be deferred as future payments. The main determinants of renegotiation in the Latin American experience are summarized in Table 26.

Table 26. Determinants of PPPs renegotiations in Latin America

Variables	Impact on renegotiation probability	Authors
Better government efficiency and regulatory quality	Reduce	Guasch et al. (2003, 2007, 2008); Guasch & Straub (2009); Estache et al. (2009); Bitran et al. (2013)
Better rule of law and less corruption	Reduce	Guasch et al. (2003, 2007, 2008); Guasch & Straub (2009); Estache et al. (2009); Bitran et al. (2013)
Election period	Increase	Guasch et al. (2003, 2007, 2008); Guasch & Straub (2009); Bitran et al. (2013)
Increase in GDP growth	Reduce	Guasch et al. (2003, 2007, 2008); Guasch & Straub (2009)
More investment	Increase	Guasch et al. (2003, 2007, 2008); Guasch (2004); Guasch & Straub (2009);
Longer contract durations	Not significant	Guasch et al. (2003, 2008); Bitran et al. (2013)
Government guarantees	Increase	Guasch et al. (2003, 2007)
Transport sector	Increase	Guasch et al. (2003, 2007); Guasch & Straub (2009)

The existence of a regulator and better institutional quality reduce the probability of renegotiation (Guasch et al., 2003, 2007, 2008; Guasch & Straub, 2009; Estache et al., 2009; Bitran et al. 2013). This can be explained by the fact that a regulator can reduce the effect of contract incompleteness by leaving less room for mistakes and uncertainties. In addition, better rule of law and lower corruption tends to reduce the likelihood of a renegotiation event. This is the result of the extent to which disputes can be resolved quickly, reliably, and fairly in a Court of Law. The mere possibility (or threat) of renegotiation being negotiated in an efficient court may affect renegotiation and its duration (Guasch et al., 2003, 2006). A better economic environment, measured by the GDP growth, has an impact in reducing the occurrence of renegotiation (Guasch et al., 2003, 2007, 2008; Guasch & Straub, 2009).

On the contrary, electoral periods tend to increase the occurrence of renegotiation. This could result in political pressure in the face of elections (Williamson, 1989; Guasch et al., 2003; Neto et al. 2018), but also opportunistic behaviour (also known as “strategic misrepresentation”, see, for instance Osland & Strand, 2010) from both sides of the argument (Governments being eager to change contracts to increase votes, and firms taking advantage of electoral cycles to increase rents; Guasch et al., 2007, 2008). Bitran et al. (2013) found that Government-led renegotiation is more often associated with electoral periods. This was the result of Governments’ opportunistic behaviour in seeking votes and increasing spending limits. However, as a result, Governments usually do not permit project failure or the interruption of services. Furthermore, tight public budgets typically encourage the public sector to pass on substantial investment obligations to the private sector, by means of PPP contracts, which can include Government guarantees, which is another determinant that is often found to increase the frequency of renegotiation (Guasch et al., 2003, 2007).

Projects with more investment tend to increase the likelihood of renegotiation, as they represent a higher level of uncertainty (Guasch et al., 2003, 2006: Guasch, 2004). Furthermore, large projects are more likely to experience cost overruns, considering that they are more complex, less standardized, and more prone to contingencies (Cruz & Marques, 2013; Moore et al., 2014).

Guasch & Straub (2006) and Guasch, Laffont, & Straub (2007) differentiate the probability of firm-led and government-led renegotiation, and confirm the importance of the above variables. Engel, Fischer & Galetovic (2009) study PPPs in Chile, and find evidence that in a competitive market, firms lowball their offers, expecting to break even through renegotiation, while governments use renegotiation to increase spending and shift the burden of payments to future governments.

In addition, Moore et al. (2014) examine the Latin American experience for the role of financial performance in triggering renegotiation. They found evidence that financial performance does not increase renegotiation, and that renegotiation does not alter the regulatory framework.

Finally, several studies found that renegotiation is more likely to occur in the transport sector (Neto et al. 2016, 2018). This could be due the effect of low competition, as facilities and services usually operate in natural monopolies. However, this could also be the effect of longer contracts, with higher levels of investment. In contrasting to telecommunications, transport operators do not suffer from “reputational damage”, and are therefore more able to seek additional rents, at the taxpayers’ and users’ expense.

Despite the abnormal frequency of renegotiation and the benefits for the private sector, the PPP program in Latin America has resulted in the construction of infrastructures that would not otherwise have been build using public procurement (due to fiscal constrains), thus reducing the “infrastructure gap” of the region. However, the consequence of renegotiation is that the benefits to the public could have been higher if substantial effort had been made to avoid such frequent renegotiation (Guasch et al., 2014).

5.3 Data and Methodology

In order to analyse the Brazilian experience (and compare it with the literature from the Latin American experience), it was collected data from 27 PPPs concessions (at

the regional level). Data was collected from the original contracts, as were the renegotiation terms (called “Termos Aditivos”). All these documents are publicly available. From these 27 projects, seven are in the transport sector⁶. These are comprised of three highways, three urban rails and one bridge. These seven concessions, from 2007 to 2016, had 20 renegotiation events.

It was used Probit models on panel data, whereby each year (our dependent variable) was labelled as either being a renegotiation, or a non-renegotiation year. Specifically, it was assumed that the model takes the form of: $\Pr (Y = 1 | X) = \Phi (X' \beta)$ [1], where \Pr denotes the probability, and Φ is the cumulative distribution function of the standard normal distribution. The parameters β can be estimated by maximum likelihood. It is possible to motivate the probit model as a latent variable model. If it was supposed there existed an auxiliary random variable: $Y^* = X' \beta + \varepsilon$ [2], where $\varepsilon \sim N(0, 1)$, thus, Y was viewed as an indicator for whether this latent variable was positive:

$$Y = \begin{cases} 1 & \text{if } Y^* > 0 \text{ i.e. } -\varepsilon < X' \beta \\ 0 & \text{otherwise} \end{cases} \quad [1]$$

It was used random-effects and population-averaged probit models and cluster standard errors at the concession (project) level. Furthermore, in order to take into consideration the fact that several project characteristics were not included and that contract clauses could be endogenous, it was used firm effects. To consider the effect of time on the probability of renegotiation, it was used year effects as well.

In our model, renegotiation events take the value of one, and zero for the non-renegotiation years of renegotiated concessions (5 of a total of 7, whereby some were renegotiated multiple times throughout our period sample), and all the concession years of the two concessions that were never renegotiated. In this model, it has 20 renegotiation events taking the value of 1, and 34 non-renegotiation years, amounting to a total of 54 observations.

In order to compare with the results from the Latin American experience described in the literature, it was used the following independent variables (Table 27):

⁶ Metro Bahia; Rodovia MG50; Linha 4 São Paulo; Tamoios São Paulo; CTrens São Paulo; Rota Fronteiras (Paraná); Rota Coqueiros (Pernambuco).

ely represents the election year (at the regional level), and it assumes 1 if the renegotiation started in a year with elections, and 0 otherwise. As it has been seen, election periods are prone to an increase in renegotiation, due to opportunistic behaviour from both parties. It was also used the year lead (elylead) and the year lag of each election year (elylag). In order to control for these effects it was used the political party that was in power in that region. This variable, party, assumes 1 if the regional government is right wing, and 0 if it is left wing. In addition, during elections, government can change, and this can impact on renegotiations. To control for this, it was used a variable govchange, which assumes 1 if the government changed after an election, and 0 otherwise.

r_{law} (rule of law) and corrp (anti-corruption level) are proxies for the quality of contract (enforcement) and regulatory quality at the country level (Brazil). These variables are dynamic, with the values ranging from 0 to 10, or 0 to 100 (quartile). The source of these values is the World Bank. An increase in the score signifies an improvement in the country's situation. Rule of Law represents the quality and strength of the legal system. Better enforcement is expected to dissuade or reject inappropriate claims for renegotiation. Less corruption is also perceived as reducing the likelihood of renegotiation. If operators believe that governmental decision making is subject to influence, the odds for renegotiation as a way of capturing additional rents may increase (Kaufman, Kraay & Zoido-Lobaton, 1999).

gdpg is the growth of GDP, whereby it is expected that higher economic growth reduces the incidence of renegotiation (Guasch et al., 2006).

Contract incompleteness and complexity, which present higher uncertainty lead to more renegotiation. It was used the investment of each project (logcapex) and also cdur for the duration of each contract. Long (and with higher investments) contract duration induces higher uncertainty regarding economic, technological, social, or political evolutions and is more prone to instability and forecast failure (Guasch, 2004; Rouboutsos & Pantelias, 2015; Chong & Hopkins, 2016).

It was also used natshareh, with 0 if the majority of the equity capital is owned by foreign companies, and 1 if the majority is owned by national companies. Political connections of the private parties can affect renegotiations (Guasch et al., 2004,

Hong & Kostovetsky, 2012), and it is expected that when foreign firms are the main shareholders in a concession, that the lack of political ties is negatively related to the probability of renegotiation. This is particularly relevant in the Brazilian context due to the major scandal of corruption involving government and the main construction companies called “lava-jato”.

With regards to the control for the experience arising from previous renegotiations, it was used two following variables *yearsreneg* is the years since the previous renegotiation was started, where it is expected that a higher number of years since the previous renegotiation increases the likelihood of a renegotiation). *concyear* is the concession age, whereby it is expected that a longer experience in managing the concessions from both parties reduces the occurrence of renegotiation (Domingues & Sarmiento, 2016). It was knowned that the average concession contract is renegotiated multiple times, however it is expected past renegotiation experience to reduce the probability of subsequent renegotiation (Ariño et al., 2014).

Table 27. Variables definition

Variable	Type/unit	Level	Description
<i>ely; elylag; ely lead</i>	Dummy	Regional	If the renegotiation started in a year with regional election, or in a year previous (lag) or after (lead) an election
<i>govchange</i>	Dummy	Regional	1 if the election produced a change in government; 0 otherwise
<i>party</i>	Dummy	Regional	1 if the regional government was right-wing; 0 otherwise
<i>corrpt</i>	Discrete (0-100)	Country	Measure of the level of the country’s corruption. 100 is the best score. An increase in score means less corruption
<i>rlaw</i>	Discrete (0-100)	Country	Measures the efficiency of the judicial and contract system. 100 is the best score. An increase in score means less corruption
<i>gdpg</i>	Continuous	Country	The growth of real GDP as a percentage
<i>cdur</i>	Discrete	Project	The number of years of duration of a contract
<i>logcapex</i>	Log	Project	The log of the total investment of each project
<i>natshar</i>	Dummy	Project	0 if the majority of the capital is owned by foreign companies, and 1 if it is owned by domestic companies
<i>concyears</i>	Discrete	Project	The number of years of the concession for each observation
<i>yearsreneg</i>	Discrete	Project	The number of years since the previous renegotiation

Table 28 presents the descriptive statistics of the variables used. A correlation matrix (not formally reported) shows evidence of multicollinearity between *govchange* and *elylead*, *corr* and *gdpg*, *cdur* and *natshar*, *yearsreneg* and *cyear*. The Wald test for all variables had a p-value of 0.000. The Ramsey test did not show any omitted variable in our models. Furthermore, it was tested for the normality of the residuals.

Table 28. Descriptive statistics

Variable	Obs	Mean	Std. Dev	Min	Max
<i>reneg</i>	54	0,37	0,49	0	1
<i>privled</i>	16	0,56	0,51	0	1
<i>ely</i>	54	0,28	0,45	0	1
<i>elylag</i>	54	0,17	0,38	0	1
<i>ely lead</i>	54	0,28	0,45	0	1
<i>govchange</i>	54	0,17	0,38	0	1
<i>party</i>	54	0,87	0,34	0	1
<i>corr</i>	54	51,29	7,84	41,40	63,00
<i>rlaw</i>	54	44,52	17,86	41,2	56,3
<i>gdpg</i>	54	1,36	3,88	-3,90	7,50
<i>cdur</i>	54	28,72	4,50	20,00	33,00
<i>logcapex</i>	54	6,30	1,40	4,34	8,19
<i>natshar</i>	54	0,81	0,39	0	1
<i>conyears</i>	54	4,80	2,95	1	11
<i>yearsreneg</i>	54	0,89	1,04	0	4

5.4 The Brazilian experience in transport PPPs

Despite being one of the largest countries in the world, Brazil has a strong “infrastructure gap”, particularly in the road and railway sector (Neto et al., 2018). As Brazil is a federal country, infrastructures (and also transportation) are developed at the federal, state, and municipal level. However, Brazil has strong fiscal constraints, due to a small tax revenue base and increasing pressure on social expenses, particularly education, health, and pensions. Therefore, the federal, state, and municipal governments struggle to raise capital to cover maintenance expenditure and have granted the private sector the right to exploit their infrastructures, through concessions.

In 1995, the general concessions Federal Law No. 8.987/95 was published. In the

2000s, there was a need for a new contractual model, which allowed not only maintenance, but also the implementation of new infrastructures required to promote economic and social development. In 2003, the government of Minas Gerais advanced and launched the first law and the first unit of PPPs in Brazil. In 2004, the state of São Paulo launched the first Brazilian PPP, the "yellow 4 metro line", in the city of São Paulo. In the same year, the Federal Government published the Federal Law governing PPPs No. 11.079/04.

The start of a new era for PPPs began with Federal Law governing PPPs No. 11.079/04. This law defines two models for concessions: sponsored or administrative modality. In the case of administrative modality, the private partner's compensation is provided exclusively through public payments, while in the sponsored concession modality, private partner remuneration is carried out by the payment of users' fees, which sometimes is complemented by public instalments. These two modalities were designed to cover all infrastructure projects. The Brazilian PPP law also define prerequisites of at least a five years period of service provision, and a minimum of R\$ 20 million (about US\$ 6.3 million) for this type of contract. Federal Law No. 12.766/12 amended Law No. 11.079/04, promoting some improvements to the previous law, making this contractual model more attractive to the private partner, whilst allowing the public entity to make payments to the private partner during the investment phase, even before the work is completed and is operational.

Thereafter, there is an increasing search for new projects. According to RadarPPP (2016), between 2006 and 2016, 121 concession contracts were signed. Of these total contracts, 35 were concession contracts bidding under Federal Law No. 8.987 / 95, which is called the General Concessions Law. The other 86 contracts were signed under Federal Law No. 11.079 / 04 - PPPs Law, of which 71 were administrative concession contracts, and 15 were from sponsored concessions. Surprisingly, the Federal Government only developed one federal PPP contract - "Datacenter Complex", which is a data centre of the Central Bank and Caixa Econômica Bank (RadarPPP, 2016).

The majority of PPP projects are developed at State and municipal level, with 48 and

37 projects respectively. The total investment in these contracts is R\$ 147 billion (approx. US\$ 46 billion). Of this total, R\$ 53 billion (approx. US\$ 16.5 billion) were for projects for the implementation of urban trains, highways, urban mobility, and airports. Almost 40% of the total invested in PPPs was for projects in the transport sector (RadarPPP, 2016).

The State and municipal governments have made progress in the publication of PPP laws, based largely on the Federal Law, but were often behind schedule in the implementation of PPP units and invested little in training and qualification of the technical staff of these management bodies.

In 2016, the Federal Government implemented the Investment Partnerships Program-IPP, in order to define the priority services for implementation using the PPP model. Faced with the economic crisis, the Federal Government adopted a strategy of accelerating common concession projects, an example being the concessions of the federal airports of Florianópolis, Salvador de Bahia, Porto Alegre, and Fortaleza (ANAC, 2017). For this type of concession there is no immediate public investment and the private partner is required to maintain and/or improve the public equipment granted since the signing of the contract.

5.5 Results

Data concerning the 27 PPPs projects and the 81 renegotiation events of all sectors is described in Table 29. These projects were implemented in the following sectors: transports (7), environment (7), health (4), sports (6 - mainly stadiums for the 2014 World Cup), prisons (2), and housing (1). These projects represent the regional PPPs after the 2007 decision to re-launch concessions to private under PPPs schemes.

Regarding the transport sector, of the seven projects, six were renegotiated at least once (85%), meaning that almost all projects had pitfalls that provoked renegotiation. In addition, a substantial number of renegotiations were for projects implemented in recent years. As our sample covers the first years of each project (with the first project starting in 2006) up until 2016, on average, these seven

projects had already run five years since they were contracted. This means that during those five years, there was an average of more than three renegotiations. Furthermore, after just two years of contract, it was found three renegotiation events. The number of events increases to nine after three year's contract, and 11 events after four years of contract. The early start of a renegotiation could be the result of a contract not being well designed, with pitfalls occurring during the bidding process, or political pressure being exerted for the infrastructure or service.

With a total of 20 renegotiation events, transport accounted for 25% of the total renegotiation events (20 out of 81). This represents an average of 3.3 renegotiations for each of the six projects. The transport sector did not renegotiate more than the environment sector in absolute terms (each sector has seven PPPs, with transport accounting for 20 renegotiations, as opposed to 21 for the environment sector). When comparing with the Latin American experience describe above, Brazilian transport PPPs tend to renegotiate more (as Guasch data only show 55% of PPPs being renegotiated).

Table 29. Sector data

	Transport	Environment	Health	Sports	Prisons	Housing	Total
Nº PPPs	7	7	4	6	2	1	27
Nº PPPs renegotiated	6	7	4	6	1	1	25
Nº Renegotiations events	20	21	11	17	8	4	81
% of the total Renegotiation events	25%	26%	14%	21%	10%	5%	n.a
Average number of renegotiations by PPPs	2.9	3	2.8	2.8	4	4	3

The detail figures on the 20 renegotiation events for transport are described in Table 30. Interestingly, from the 16 renegotiation events that it was identified, that triggered renegotiation, 15 were from PPPs with domestic shareholders holding the majority of the capital (as, accordingly, it was unable to use that variable in our regressions with priviled renegotiations). From those 15 events, nine were private-led, meaning that all our renegotiation events triggered by the private sector were from PPPs owned by domestic shareholders. This is strong evidence that domestic

firms tend to renegotiate more and with a higher bargaining power. Furthermore, renegotiation occurred mainly when right-wing governments were in power. However, this could be due to the fact that for most of the time in these regions, the right wing was in power. In other words, this could just be the effect of time (which is something to be discuss later in our regressions, when using this variable). A substantial number of renegotiations occurred during an electoral period (15, if was considered not only an election year, but also the lag and the lead).

Table 30. Transport Renegotiations events

This table presents the renegotiation events according to several variables used in this chapter. The total number of renegotiation events in transport was 20. From these, it was able to collect data of who triggered the renegotiation (private or public) for 16. From these, nine were private led and seven were public led.

	Nº Renegotiation events (N=20)	Nº private-led events (N=9)
In an election year	6	4
In a year previous to an election	3	1
In a year after an election	6	1
With a change of government	4	1
With a right-wing government	18	8
PPPs with domestic shareholders holding the majority of the capital	15	9

The motives for Brazilian PPPs renegotiation are described in Table 31. It is presented the number of times each motive was used, both for transport PPPs and for all sectors. When looking at the transport sector, a significant number of changes result from the inclusion or exclusion of clauses in the contract, which do not create contingencies, obligations, or financial commitments. However, several renegotiations were due to changes in the project design and features, along with additional works, showing that initial planning may have some pitfalls. This is reinforced by the number of renegotiations that were due to delays in expropriation. There is a clear predominance of governmental change of scope (rather than private-sector-driven opportunism). In the Brazilian case there seems to be more effect of government inefficiency and strategic misinterpretation (or eventually opportunistic behaviour from public sector, seeking votes during electoral periods, as most of the renegotiation events also happens during electoral years) than opportunistic behaviour from private sector.

Table 31. Renegotiations motives (in Transport sector PPPs)

In some cases, the process of renegotiation was due to more than one reason. Source: Authors, based on data collected.

Motives	Description	Who caused the contract change	Who triggered the other party	Nº of motives in Transport PPPs	Total
Change in project design	<ul style="list-style-type: none"> Change in the scope of the contract. Government creates/eliminates services 	Public	Private/ Public	7	20
Change in project features	<ul style="list-style-type: none"> The Government change its demands about projects features, for technical or political propose. The private partner suggests a different technical solution to improve the project cost/performance. 	Public/ Private	Private/ Public	4	9
Additional work	<ul style="list-style-type: none"> Additional investment. Government decides (or Private claims) to increase investment/services. 	Public/ Private	Public/ Private	2	8
Tax benefits	<ul style="list-style-type: none"> Tax benefits offered by the Government. 	Public	Public/ Private	0	4
Change in environment requirements	<ul style="list-style-type: none"> Necessary changes in a project to achieve permission from a government environmental agency and in order to comply with legislation. 	Public	Public	0	4
Administrative delays	<ul style="list-style-type: none"> Extension of the deadlines for the realization of the investments and/or operational activities, due to public administrative delays. 	Public	Private	1	3
Review of previous terms	<ul style="list-style-type: none"> The Government publishes additional terms, reviewing clauses and/or previous terms. 	Public	Public	0	3
Analysis of contract terms	<ul style="list-style-type: none"> Interruption of the contract until the Government completes the technical analysis and economic/ financial feasibility of the project. 	Public	Public	0	3
Delay in expropriation	<ul style="list-style-type: none"> The delay or non-expropriation of land. 	Public	Private	3	3
Transfer of corporate control	<ul style="list-style-type: none"> The concessionaire transfers ownership. 	Private	Private	0	2
Change in the risk matrix	<ul style="list-style-type: none"> Reduction of the contractual guarantees of the Government. 	Public/ Private	Private	0	2
Force Majeure	<ul style="list-style-type: none"> Acts of God. 	Private	Private	0	1
Specific legal changes	<ul style="list-style-type: none"> Changes in sector or project legislation. 	Private	Private	0	1
Corrections to the contract	<ul style="list-style-type: none"> Inclusion or exclusion of clauses in the contract, which do not create contingencies, obligations, or financial commitments. 	Private/ Public	Private/ Public	17	39
TOTAL				34	102

The results for the probit model of the determinants of renegotiations are presented in Table 32. Our results confirmed most of the results from the literature concerning the Latin American experience. As expected, political context matters in terms of the likelihood of renegotiation. Election periods increase the probability of renegotiations. In addition, right-wing parties in regional governments seem to renegotiate more (even when controlling for time effects). Lastly, political ties are important, as PPPs with national shareholders renegotiate much more frequently than PPPs with foreign shareholders, which confirms our previous results.

Contract uncertainty also seems to increase the likelihood of a renegotiation event occurring. It can be seen that longer contracts (*cdur*) and higher investment (*logcapex*) are significant, with a positive coefficient.

On the other hand, and in line with the literature, a less corrupted environment tends to reduce the probability of a renegotiation event. This is true, even when it is controlled for GDP growth. A better economic performance is also likely to reduce renegotiations. Finally, better experience in the management of PPPs tends to reduce renegotiations. The concession age (*cyears*) is significant, with a negative coefficient.

Table 32. Probit Renegotiations

This table presents the results of a probit model with year and firm effects, and renegotiation/no-renegotiation event (1 in case of a renegotiation) as the dependent variable. It is used alternative variables in some models, as it cannot include all variables in the same model due to multicollinearity. It is used year effects, country (State effects) and firm effects to control for possible specific effects. Robust standard errors are in parentheses. Clustering of standard errors is at the contract level. *** stands for $p < 0.01$, ** stands for $p < 0.05$, and * for $p < 0.1$.

VARIABLES	(1) reneg	(2) reneg	(3) reneg	(4) reneg	(5) reneg
Political variables					
ely	2.99** (1.49)	2.35* (1.22)	2.07** (0.94)	0.69 (1.09)	2.99** (1.49)
elylag	0.70 (1.04)	-1.31 (0.97)	-1.23 (0.90)	1.93 (1.41)	0.70 (1.04)
elylead	-0.17 (0.91)	-0.11 (0.91)		-0.26 (0.86)	-0.17 (0.91)
party	6.11*** (0.93)	6.10*** (0.98)	6.27*** (1.13)	6.11*** (0.92)	6.11*** (0.92)
govchange			0.30 (0.85)		
Institutional Variables					
corrp	-0.52*** (0.18)	-0.04 (0.06)	-0.03 (0.07)		-0.52*** (0.18)
rllaw	-0.01 (0.02)	0.05** (0.02)	0.05** (0.02)		-0.01 (0.02)
gdpg				-1.01* (0.56)	
Contract variables (control)					
cdur	0.33*** (0.09)	0.46*** (0.10)	0.46*** (0.10)	0.38*** (0.09)	
logcapex	-2.61* (1.40)	2.47*** (0.35)	2.47*** (0.34)	-1.01 (1.65)	-2.87** (1.38)
natshar					3.63*** (0.95)
Experience variables (control)					
concyears	-2.53*** (0.80)			-1.67* (0.92)	-2.53*** (0.80)
yearsreneg		0.70 (0.47)	0.64 (0.42)		
Constant	42.02* (22.64)	-34.15*** (5.71)	-34.72*** (5.97)	-1.00 (16.18)	50.36** (21.81)
Wald test	0.00	0.00	0.00	0.00	0.00
R2	0.32	0.36	0.37	0.31	0.30
Observations	54	54	54	54	54

5.6 Policy implications

The results from the previous section provide us with some insights to draw policy implications from this research. Failures in project studies and concept and planning (in terms of the scope of the project, level of investment, improper and ambiguous risk allocation, minimum requirements, selection criteria, and PPP procurement

procedures, as well as lack of effective contract monitoring) all tend to increase renegotiation. Furthermore, opportunistic behaviour by the public sector (to obtain benefits from inaugurating a new infrastructure or service, or a change of conditions for users) can also trigger renegotiation, together with opportunistic behaviour from the private sector, which, typically, is eager to increase rents.

Firstly, transport PPPs in Brazil have renegotiated substantially, and it can be claimed with an abnormal frequency. Our analyses show strong weakness in planning (as many renegotiation events occurred due to contract and project changes, together with administrative delays). This means that projects are often developed without careful planning, with several administrative processes still not being concluded (e.g. obtaining permits and approvals). There is also scope to improve the bidding process, as these renegotiations have shown some evidence of a lack of transparency and competition during the process. There could be a distortion in a public tender, in that the most likely winner is not always the most efficient operator but is the most expert/qualified in renegotiation. In addition, monitoring the construction and operation of PPPs should be of concern for public authorities. This implies that the first policy implication is that Brazilian public authorities need to improve the processes of planning and procurement, given their impact on the likelihood of renegotiation.

Our sample covers PPPs in five different Brazil regional states (Bahia; Minas Gerais, Paraná; São Paulo, and Permanbuco). From these five regional governments, only Bahia has a PPP unit that is centralized at the regional level. The pitfalls presented may reflect the lack of legal/technical ability and foresight on the part of the executive public entities, and the prevalence of asymmetric information in the case of the public sector. The best practices in PPPs (OCDE, 2010) provide evidence for our second policy implication: the need for PPPs units in each region. There is also a role to be played by a regional level Court of Audits, as these entities usually play a very important part in the PPPs process, increasing accountability and transparency and providing better practices.

Public authorities also need to learn more from the private sector, as the increase in the number of years of each PPP seems to reduce the occurrence of future

renegotiation. There is some evidence of a learning process in the case of them private sector. This expertise needs to be shared and captured on the public side. For this to happen, an institutionalized body is needed to retain knowledge and to consolidate a learning curve. Our third policy implication is that the public sector, based on a PPP unit, needs to increase access to data and information regarding each project.

Considering that during elections renegotiation occurs more frequently, and that the Government frequently takes the initiative to initiate renegotiation, our fourth policy implication is the need for renegotiation to be carried out, or at least evaluated, by an independent authority where political influence is minimized as much as possible. This could be the above-mentioned PPP unit, although the prospect of monitoring and renegotiation by the same entity can also pose some risks. In addition, there is a need to set fiscal rules to limit public spending on PPPs.

Our fifth policy implication regards the political connections, in a country such as Brazil, where this issue is a major problem. A ban on conflicts of interests by former politicians (and by extension, those with experience in the relevant ministries) ought to be introduced, even if the political ties had been established in the past.

As the Brazilian public sector intends to continue to launch new PPPs projects, particularly in the transport field, all these policy implications are extremely relevant. The public sector in Brazil needs to evaluate the concept and planning of PPPs, otherwise new projects will repeat the same errors as in the past, leading to new renegotiation events with an abnormal level of recurrence.

5.7 Partial conclusions

This chapter presents the Brazilian experience of renegotiation for regional (state) Public Private Partnerships in transport from 2006 to 2016. There is some evidence of a high level of renegotiation, confirming the previous findings of Guasch (2004) and Neto et al. (2018). These renegotiations have decreased the initial benefits and advantages of the PPP model, also causing a fiscal impact. While some renegotiations may have been efficient, this high frequency indicates a degree of opportunistic behaviour, particularly from the public side. It was also found that electoral period and change in government increase the probability of renegotiation. The likelihood of renegotiation is also increased by contract uncertainty (longer and with higher investment). On the contrary, a better institutional and economic environment decreases the occurrence of renegotiation.

Renegotiation is probably the greatest risk for the successful development of a PPP. Given the long-term nature of these projects, renegotiation will have a profound and long-term impact, as well as the potential to erode all the benefits that support the case for adopting the PPP model. The lessons from existing processes can provide a valuable contribution for developing countries that have, or plan to have, active PPP programs.

Based on our results, it is provided several policy implications which not only are applicable for the Brazilian context, but also to a large extent for medium income countries, particularly those that are still in the early stages of implementing a PPP program. Improving the performance of PPPs and reducing the occurrence of renegotiation (particularly when motivated by opportunistic behaviour) can bring substantial value to both the public and the private sectors.

Chapter 6. Conclusions

6.1 General findings

Developing and emerging countries have a considerable infrastructure deficit around the world. With restricted budgets, their governments must decide between two options to carry out these expensive projects: i) build these projects themselves; ii) or delegate its construction and management to the private sector. The first choice obliges governments to have the money during the project construction period and to assume the management and maintenance of the infrastructure forever. In the second case (PPPs), governments (most of the time) abstain from payments during construction, beginning the payment of benefits to the concessionaire only from the start of its operation and management.

The choice of these governments by the PPPs at first sight seems logical: to delegate to the private the construction, operation and maintenance of these infrastructures and pay in soft installments. However, in order to achieve the economic and social objectives to which the project was originally designed, it does not seem like a task for beginners. Otherwise, there would not be an endless number of PPP projects being renegotiated everywhere.

In general terms, the main objective of this thesis was to review the literature on the subject of PPPs, analyzing it and comparing it with the Brazilian case, seeking to identify problems and solutions that would contribute to the improvement of PPPs in Brazil.

The starting point (Chapter 2) was to know and review the academic literature on PPPs. In the bibliometric analysis from the Web of Science, more than 600 papers were analysed over a period of 25 years. This work pointed out that the growing interest of the academy by theme. This reinforces the trend of increasing the number of PPP projects each year, with the strongest growth in developing countries.

This chapter also presented important conclusions to indicate the contents to be studied in the following chapters of the thesis. Firstly, the two tables created by us showed that the projects sectors with the greatest number of published papers were transportation and health and environmental care. This result would be repeated in the chapter dealing with Governance and PPP Units (Chapter 3), where the project

sectors with the highest number of PPPs in Brazil are exactly the same. Another relevant conclusion was that the research topics that had the least number of published papers were the termination and renegotiation of contracts. After observing the intriguing number of renegotiations revealed through the data obtained in this chapter 3 (PPP Units and Renegotiations), it was realized the need to thoroughly investigate these cases, having dedicated the last two chapters of the thesis to the subject of renegotiations.

6.2 PPP Governance

A consensus statement within the theme's researchers is that the success of PPPs is directly linked to the degree of experience and knowhow of governments to manage the projects life-cycle from its conception, planning, project design and contract management. Few papers have been written about PPPs in Brazil and even less about their programs. The challenge then was to collect the data available on the internet and, when possible, to confront information directly hosted by government departments. In Chapter 3 it was analysed the Brazilian PPPs units and programs. The survey collected data from the 27 federative units, where more than 200 projects were identified in their most different stages.

Looking at the Brazilian governance model, it was concluded that the sponsoring departments were the same ones that responded for the state budgeting and/or the governments' strategic decisions. This may indicate that governors prefer that PPPs be in places that they trust and have easy and immediate access. Evidence found that the units with the largest staff were not proportional to the number of projects contracted. However, in relation to the contract management of these PPPs, it was noticed that the most experienced units with the highest number of contracted projects were, as a rule, the same ones with the highest number of renegotiated projects.

In Brazil, it was observed that the first state governments movement towards the implementation of PPP programs was through the publication of their state's PPP law. Of the 27 federative units, 25 had already published these laws, which

demonstrates the governments growing interest in these contractual models, during these 15 years of PPP's Federal Law no. 11,079/04, was published. However, state governments do not seem to show the same interest in promoting transparency, as only half of them provide information about their PPP programs and projects on the Internet. Here the most experienced PPP units, and with the greatest number of projects, are the ones that provide the greatest number and detail of this information.

It was noticed the growth in the number of Brazilian's PPP projects, with emphasis on transportation sector, where one-fourth of the 49 projects were contracted. These expensive projects require the financial contribution of the users. Next came the environment and health sectors, which confirms the worldwide trend previously identified in Chapter 2 (Literature Review). It was also realized that governments were more likely to sign PPP contracts in the last years of government than in the early years. This may reflect that the PPP implementation time is relatively large and/or that new governments are not comfortable signing PPP contracts that have not been generated within their administrations.

6.3 Renegotiations

Renegotiations of PPP contracts can have undesirable effects on both partners. Sometimes the repercussion is so representative that it can result in the partial annulment of the social benefit expected by the public sector. In the case of the private sector, the reduction of payments can have such a large impact that it can make the projected financial return unfeasible. In emerging countries like Brazil, governments cannot afford to take the risk of having such high investments not completed or completed at an unrealistic cost, eliminating its value-for-money.

If the challenge of finding articles on PPP program management was hard, finding scientific articles on the renegotiations of Brazilian PPPs even more difficult. Perhaps because of the difficulty in finding information made available by governments, or sometimes because of the quality and quantity of available information, or because the subject is relatively recent. In chapter 4 it was analysed

all 42 Brazilian state PPPs, since 2006, in the most diverse sectors. Of these, 27 had been renegotiated at least once. Such a large number of cases aroused our interest in finding out if there was a pattern in these renegotiations. All the information available on the internet, and on the websites of the public bodies, as well as the private sectors, were confronted with the answers of a questionnaire, previously prepared, sent to each state PPP unit or body responsible for PPPs in these states.

It was concluded that, in most cases, the first renegotiation event occurred within a short period after the start of the contract. With the increase in the number of projects, and with the progress of each contract, renegotiations occurred more frequently. It was noticed that in most cases the motive was on the side of the public sector, due to failures in planning and contract design. It was also noted that electoral periods and political connections between partners had a significant impact on renegotiations. Aspects such as government political party in the mandate, nationality of the consortium, and allocation of risk of demand to the private increased the likelihood of renegotiations. These conclusions lead us to write chapter 5, where it was investigated even more deeply the political implications in the renegotiations, using as sample the Brazilian PPPs of the transport sector.

The case of renegotiations in the transportation sector in Brazil (Chapter 5) confirms previous conclusion of chapter 4, that PPPs tend to be renegotiated too often and too soon. Other similar conclusion reinforced in this chapter is the that failures in the design and planning of these projects occurred due to negligence in the preparation of its scope, level of investment, improper and ambiguous risk allocation, minimum requirements, selection criteria, and PPP procurement procedures, as well as lack of effective contract monitoring. It was also perceived the opportunistic behavior of the public sector has also been confirmed, which in the impetus to obtain the sympathy of the population with the inauguration of a new infrastructure or service, or a change of conditions for the users, can provoke a renegotiation along with opportunistic behavior of the private sector, which, usually eager to increase rents.

Finally, confirming the indications in chapter 3 (PPP Units and Governance), it was verified the need for PPP units in all regions, as well as increase access to data and information of their projects. In addition, there are a need for renegotiations to be carried out, or at least evaluated, by an independent authority, where political influence is minimized as much as possible. Renegotiations have reduced the benefits and advantages initially foreseen in the contractual model of PPPs. On the other hand, improve institutional and regulatory framework, will decrease the occurrence of renegotiation.

6.4 Further developments

During the course of this research, several interesting and unanswered questions have emerged along the several chapters. The issues not refereed in detail in the thesis will be presented next.

It was observed that in the Brazilian experience, a multidisciplinary in the nature of the sponsoring departments 'areas in charge of managing the state PPPs. However, there are still relevant gaps in questions such as: What would be the most appropriate department to host a PPP unit? What should be the size, composition, organization and training of this staff? What skills would be needed by the staff of this department to oversee the main PPP processes. Future studies could also analyse the next steps for an effective policy of public transparency, analyzing what kind of information should be made available by PPP units, their level of detail, relevance, updating, and ease of access to the population. There is also another question related to PPP units that still lacking an analysis: Can they have an independent technical body to decrease the political bias towards project evaluation and, also, to monitor renegotiation? In order to fully understand the Brazilian experience, other complementary research on PPP units and renegotiation should address new robust data also from the federal and municipal sphere.

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Appendix

S.1 PPP papers identified in the bibliometric analysis from 1991 to 2014:

Number	Year	Title	Author(s)	Journal
1	2014	Project Finance and Public-Private Partnerships for the provision of infrastructure services in Colombia	González, JD.; Rojas, Miguel D.; Arboleda, Carlos A.; Botero, Sergio.	OP
2	2014	Public-private partnerships for health services: the solution for the Peruvian health system?	Zevallos, L.; Salas, V.; Robles, L.	RPMESP
3	2014	Improving complementary feeding in Ghana: reaching the vulnerable through innovative business--the case of KOKO Plus	Ghosh, S.; Tano-Debrah, K.; Aaron, GJ.; Otoo, G.; Strutt, N.; Bomfeh, K.; Kitamura, S.; Suri, DJ.; Murakami, H.; Furuta, C.; Sarpong, D.; Saalia, F.; Nakao, Y.; Amonoo-Kuofi, H.; Uauy, R.; Toride, Y.	ANYAS
4	2014	Value for money: To what extent does discount rate matter?	Contreras, C.	REA
5	2014	Task Interdependence and Noncontractibility in Public-Good Provision	Chen, BR.; Chiu, YS.	JITE
6	2014	Quality of institutions and private participation in transport infrastructure investment: Evidence from developing countries	Percoco, M.	TR-PP
7	2014	From State to Market: Private Participation in China's Urban Infrastructure Sectors, 1992-2008	Zhang, YL.	WD
8	2014	Considerations of private sector obstetricians on participation in the state led "Chiranjeevi Yojana" scheme to promote institutional delivery in Gujarat, India: a qualitative study	Ganguly, P.; Jehan, K.; de Costa, A.; Mavalankar, D.; Smith, H.	BMC-PC
9	2014	Unbundling tolls from contracts: a new road PPP model	Tamayo, JS.; Vassallo, JM.; Baeza, MD.	PMM
10	2014	Integrating Environmental Outcomes into Transport Public-Private Partnerships	Grasman, SE.; Faulin, J.; Lera-Lopez, F.	IJST
11	2014	Public-Private Partnership Experience in the International Arena: Case of Turkey	Gurgun, AP.; Touran, A.	JME
12	2014	Determining appropriate government guarantees for concession contract: lessons learned from 10 PPP projects in China	Xu, YL.; Yeung, JFY.; Jiang, SH.	IJSPM
13	2014	Risk assessment of PPP contracts	Berner, F.; Hermes, M.; Weigl, A.	BAUINGEN IEUR
14	2014	Stakeholder dynamics and responsibilities in Public-Private Partnerships: A mixed experience	De Schepper, S.; Dooms, M.; Haezendonck, E.	IJPM
15	2014	Concession period for PPPs: A win-win model for a fair risk sharing	Carbonara, N.; Costantino, N.; Pellegrino, R.	IJPM
16	2014	Correlation Analysis of Capital and Life Cycle Costs in Private Financial Initiative Projects	Wang, NN (Wang, Nannan)	JME
17	2014	Financial Evaluation for Toll Road Projects Considering Traffic Volume and Serviceability Interactions	Jeerangsuwan, T.; Said, H.; Kandil, A.; Ukkusuri, S.	JIS
18	2014	Public-private partnerships for the development of port hinterlands and their ramifications for global supply chain management	Min, H.; Jun, CY.	MEL
19	2014	Public-private partnerships in Flemish schools: a complex governance structure in a complex context	Van Gestel, K.; Willems, T.; Verhoest, K.; Voets, J.; Van Garsse, S.	PMM
20	2014	Proactive measures of governmental debt guarantee to facilitate public-private partnerships project	Tserng, HP.; Ho, SP.; Chou, JS.; Lin, C.	JCEM
21	2014	Public-private partnerships in the response to HIV: experience from the resource industry in Papua New Guinea.	Miles, K.; Conlon, M.; Stinshoff, J.; Hutton, R.	RRH

Number	Year	Title	Author(s)	Journal
22	2014	Maximizing the value for money of PPP arrangements through flexibility: An application to airports	Martins, J.; Marques, RC.; Cruz, CO.	JATM
23	2014	Public-private partnerships value in bioenergy projects: Economic feasibility analysis based on two case studies	Fantozzi, F.; Bartocci, P.; D'Alessandro, B.; Arampatzis, S.; Manos, B.	BB
24	2014	Academic effectiveness of private, public and private-public partnership schools in Pakistan	Amjad, R.; MacLeod, G.	IJED
25	2014	Motivations, obstacles, and resources determinants of public-private partnership in state toll road financing	Wang, Y.; Zhao, ZJ.	PPMR
26	2014	Democratic accountability in public-private partnerships: the curious case of Flemish school infrastructure	Willems, T.	PA
27	2014	Risk allocation in a public-private partnership: a case study of construction and operation of kindergartens in Kazakhstan	Mouraviev, N.; Kakabadse, NK.	JRR
28	2014	Forester networks: The intersection of private lands policy and collaborative capacity	Knoot, TG.	LUP
29	2014	Public-private partnerships during waterfront development process: The example of the world exposition	Huang, WC.; Kao, SK.	OCM
30	2014	PPPs and Project Overruns: Evidence from Road Projects in India	Rajan, TA.; Gopinath, G; Behera, M.	JCEM
31	2014	Concession Renegotiation Models for Projects Developed through Public-Private Partnerships	Xiong, W.; Zhang, XQ.	JCEM
32	2014	Managing Infrastructure Projects in Australia A Shift From a Contractual to a Collaborative Public Management Strategy	Alam, Q.; Kabir, MH.; Chaudhri, V.	AS
33	2014	Alzheimer's disease from researcher to caregiver: a personal journey and call to action	Stephenson.	ERN
34	2014	Place and Importance of Public Private Partnerships in the System of Government Accounting	Emek, U.	IIVF
36	2014	Review of international experience with public-private partnership in the irrigation subsector	Trier, R.	ID
37	2014	Overcoming the current deadlock in antibiotic research	Schaberle, TF.; Hack, IM.	TM
38	2014	Revitalizing Historic Buildings through a Partnership Scheme: Innovative Form of Social Public-Private Partnership	Cheung, E.; Chan, APC.	JUPD
39	2014	Improving Systemwide Sustainability in Pavement Preservation Programming	Anastasopoulos, PC.; Haddock, JE.; Peeta, S.	JTE
40	2014	An enhanced multi-objective optimization approach for risk allocation in public-private partnership projects: a case study of Malaysia	Alireza, V.; Mohammadreza, Y.; Zin, RM.; Yahaya, N.; Noor, NM.	CJCE
41	2014	Effect of public-private partnership in treatment of sexually transmitted infections among female sex workers in Andhra Pradesh, India	Kokku, SB.; Mahapatra, B.; Tucker, S.; Saggurti, N.; Prabhakar, P.	IJMR
42	2014	Financial sustainability in municipal solid waste management - Costs and revenues in Bahir Dar, Ethiopia	Lohri, CR.; Camenzind, EJ.; Zurbrugg, C.	WM
43	2014	Identifying the critical success factors for relationship management in PPP projects	Zou, WW.; Kumaraswamy, M.; Chung, J.; Wong, J.	IJPM
44	2014	Identifying the strengths, weaknesses, opportunities and threats to TOT and divestiture business models in China's water market	Jang, WS.; Lee, DE.; Choi, JH.	IJPM
45	2014	Public-private partnerships in Russia: dynamics contributing to an emerging policy paradigm	Mouraviev, N.; Kakabadse, NK.	PS
46	2014	PPP projects in transport: evidence from light rail projects in Spain	Carpintero, S.; Petersen, OH.	PMM
47	2014	Public-Private Partnership Tenders Optimizing on Competition	Rouboutsos, A.; Sciancalepore, F.	TRR
48	2014	New Tool to Understand Value-for-Money Analysis Concepts in Evaluating Public-Private Partnership Options	DeCorla-Souza, P.	TRR
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446	2003	A financial analysis of the National Air Traffic Services PPP	Shaoul, J.	PMM
447	2003	Public-private partnership in the water supply and sanitation sector: The experience of the Republic of Yemen	Sahooly, A.	IJWRD
448	2003	Scenarios for public-private partnerships in water management: A case study from Jordan	Al-Jayyousi, OR.	IJWRD
449	2003	Part privatization of United Kingdom's airspace - National Air Traffic Services' experience one year on	Majumdar, A.; Ochieng, W.	ATC
450	2003	PPP insights in South Africa.	du Toit, J.	WHHS
451	2002	A financial appraisal of the London underground public - Private partnership	Shaoul, J (Shaoul, J)	PMM
452	2001	Procurement protocols for public-private partnered projects	Zhang, XQ.; Kumaraswamy, MM.	JCEM
453	2001	Rainwater drainage management for urban development based on public-private partnership	Matsushita, J.; Ozaki, M.; Nishimura, S.; Ohgaki, S.	WST
454	1999	Past abuses and future uses of private finance and public private partnerships in transport	Glaister, S.	PMM
455	1991	Decision-support methodology for planning and evaluating public-private partnerships	Crosslin, RL.	JUPD

S.2 PFI papers identified in the bibliometric analysis from 1991 to 2014:

Number	Year	Title	Author(s)	Journal
1	2014	Whole life project management approach to sustainability	Wang, NN; Wei, KN; Sun, H.	JME
2	2014	Public enterprises in the healthcare sector - a case study of Queen Elizabeth Hospital, Greenwich, England	Lethbridge, J.	JEPR
3	2014	Comparative performance of healthcare and transport PFI projects: empirical study on the influence of key factors	Henjewe, C; Sun, M; Fewings, P.	IJPM
4	2013	PFI redux? Assessing a new model for financing hospitals	Hellowell, M.	HP
5	2013	An evaluation tool for design quality: PFI sheltered housing	Giddings, B; Sharma, M; Jones, P; Jensen, P.	BRI
6	2013	Avoiding performance failure payment deductions in PFI/PPP projects: model of critical success factors	Oyedele, LO.	JPCF
7	2013	PPP and PFI: the political economy of building public infrastructure and delivering services	Hare, P.	OREP
8	2013	Performance assessment of a private finance initiative road project	Akbiyikli, R.	TRANSPORT
9	2013	Analysis of the capability of Korean construction companies for international investment development business	Kim, H.	JKIBC
10	2013	A study on the role and implications of PFI prisons in Japan	*	KSSR
11	2013	A study on the co-operative construction project for the national and/or public youth facility in Korea	*	YFE
12	2012	Public-private partnerships/private finance initiatives in Portugal theory, practice, and results	Silvestre, HC; De Araujo, JFFE.	PPMR
13	2012	Achieving sustainable construction within private finance initiative (PFI) road projects in the UK	Akbiyikli, R; Eaton, D; Dikmen, SU.	TEDE
14	2012	Is the jury still out on PFI contracts?	Baillie, J.	HE
15	2012	Accounting-related research in PPPs/PFIs: present contributions and future opportunities	Andon, P.	AAAJ
16	2012	A study on the PFI for social infrastructure and fundamental rights	*	SAC
17	2011	Evaluating success of public private partnership projects	Kusljic, D; Marenjak, S.	GRADEVINAR
18	2011	Risk allocation in the operational stage of private finance initiative projects	Wang, NN.	JPCF
19	2011	Financing road projects by private finance initiative: current practice in the UK with a case study	Akbiyikli, R; Dikmen, SU; Eaton, D.	TRANSPORT
20	2011	Housing regeneration and the private finance initiative in England: unstitching the neoliberal urban straitjacket	Hodkinson, S.	ANTIPODE
21	2011	Private finance initiative (PFI) for road projects in UK: current practice with a case study	Akbiyikli, R; Dikmen, SU; Eaton, D.	PTT
22	2011	Stakeholder engagement and compliance culture an empirical study of Scottish private finance initiative projects	Foo, LM; Asenova, D; Bailey, S; Hood, J.	PMR
23	2011	Building schools for the future': reflections on a new social architecture	Mahony, P; Hextall, I; Richardson, M.	JEP
24	2011	The private finance initiative in English council housing regeneration: a privatization too far?	Hodkinson, S.	HS
25	2011	A study on introduction and status of private prison in Japan	*	KJCD
26	2011	A study on the causal loop analysis and the economics of BTO and BTL system of PFI	Choi, N.	KSDR
27	2011	A case study of Glasgow's use of the prudential borrowing framework (PBF) for schools rationalisation	Bailey, SJ; Asenova, D.	LGS
28	2011	A study on the validity and value for money (VFM) of the railway build-transfer-lease (BTL) project: based on the case comparison of the BTL trunk line projects	You, N.	KAPS
29	2010	Localism and energy: negotiating approaches to embedding resilience in energy systems	O'Brien, G; Hope, A.	EP

30	2010	Corporate and political strategy in relation to the private finance initiative in the UK	Ruane, S.	CSP
31	2010	Regulating employment conditions in a hospital network: the case of the private finance initiative	Bach, S; Givan, RK.	HRMJ
32	2010	Employing the net present value-consistent IRR methods for PFI contracts	Chiang, YH; Cheng, EWL; Lam, PTI.	JCEM
33	2010	Public sector comparators for UK PFI roads: inside the black box	Bain, R.	TRANSPORTATION
34	2010	PPPs in health: static or dynamic?	Blanken, A; Dewulf, G.	AJPA
35	2010	Public-private partnerships: governance scheme or language game?	Hodge, G; Greve, C.	AJPA
36	2010	Managing multiple markets: big firms and PFI	Leiringer, R; Schweber, L.	BRI
37	2010	Costs, outputs and outcomes in school PFI contracts and the significance of project size	Demirag, I; Khadaroo, I.	PMM
38	2010	The royal infirmary of Edinburgh: a case study on the workings of the private finance initiative	Cuthbert, M; Cuthbert, J.	PMM
39	2010	An empirical study of factors facilitating private finance initiatives (PFI) of social overhead capital in local governments - focusing on actors in local PFI projects -	*	KPAJ
40	2009	Delivering innovation in hospital construction: contracts and collaboration in the UK's private finance initiative hospitals program	Barlow, J; Koberle-Gaiser, M.	CMR
41	2009	Perception of financial institutions toward financing PFI projects in Hong Kong	Chiang, YH; Cheng, EWL.	JCEM
42	2009	The evaluation of value at risk in build transfer lease project	Choi, SJ.	JKAICS
43	2009	Local government's contract law & private finance initiative law in "regional development" context	Daein, K.	LGLJ
44	2009	Exporting public-private partnerships in healthcare: export strategy and policy transfer	Holden, C.	PS
45	2009	Legal analysis on private finance initiative for social infrastructure project	Daein, K.	PLLR
46	2009	The private finance initiative	Wall, A; Connolly, C.	PMR
47	2008	Ex-ante evaluation of PFIs within the Italian health-care sector: what is the basis for this PPP?	Barretta, A; Ruggiero, P.	HP
48	2008	The private finance initiative, project form and design innovation - the UK's hospitals programme	Barlow, J; Koberle-Gaiser, M.	HP
49	2008	Participation, barriers, and opportunities in PFI: the United Kingdom experience	Carrillo, P; Robinson, H; Foale, P; Anumba, C; Bouchlaghem, D.	JME
50	2008	Has the nao audited risk transfer in operational private finance initiative schemes?	Pollock, AM; Price, D.	PMM
51	2008	Trust in project financing: an Italian health care example	Barretta, A; Busco, C; Ruggiero, P.	PMM
52	2008	The cost of using private finance to build, finance and operate hospitals	Shaoul, J; Stafford, A; Stapleton, P.	PMM
53	2008	A study on the Japanese PFI prison and its applicability to Korea	Park, S.	CR
54	2008	Managing risk and regulation within new local 'health economies': the case of NHS lift (local improvement finance trust)	Aldred, RE.	HRS
55	2008	Problems and solutions of LCC analysis in BTL project for education facilities	Taek, HC; Hong, T; Lee, H.	KJCEM
56	2008	Police, governance and the private finance initiative	Johnston, L; Button, M; Williamson, T.	PS
57	2008	Value for money in PFI proposals: a commentary on the UK treasury guidelines for public sector comparators	Coulson, A.	PA
58	2008	Education, education, education: the third way and PFI	Connolly, C; Martin, G; Wall, A.	PA
59	2007	Managing contracts under the UK's private finance initiative: evidence from the national health service	Lonsdale, C; Watson, G.	PP
60	2007	Private sector participation in health and social care services in Scotland: assessing the risk	Asenova, D; Stein, W; McCann, C; Marshall, A.	IRAS
61	2007	The private finance initiative in the UK - a value for money and economic analysis	Ball, R; Heafey, M; King, D.	PMR
62	2007	Alternative approach to credit scoring by DEA: evaluating borrowers with respect to PFI projects	Cheng, EWL; Chiang, YH; Tang, BS.	BE
63	2007	An examination of the UK treasury's evidence base for cost and time overrun data in UK value-for-money policy and appraisal	Pollock, AM; Price, D; Player, S.	PMM

64	2007	Effectiveness of private finance initiatives (PFI): study of private financing for the provision of capital assets for schools	Kakabadse, NK; Kakabadse, AP; Summers, N.	PAD
65	2007	The UK's prudential borrowing framework: a retrograde step in managing risk?	Hood, J; Asenova, D; Bailey, S; Manochin, M.	JRR
66	2007	Analysis on key influence factors for the activity in the BTL system	Koo, K; Hong, T.	JAIKSC
67	2007	A value-for-money model of BTL projects for educational facilities by system dynamics	Kook, D.	JAIKSC
68	2007	A study on VFM solution for sewage treatment facilities	Rhee, J.	KPA
69	2007	A survey on the persons in charge for economic estimation analysis and improvement of BTL projects	Lee, CK; Keun, PT; Bongho, C.	KJCEM
70	2007	Item establishment and importance analysis for qualitative VFM of BTL system	Yong, KS.	KJCEM
71	2007	A study on the minimization of problems of the direct payment for subcontractor's work in public construction project	Cho, Y.	KJCEM
72	2007	A implication from study of Japanese PFI system	*	PPR
73	2007	A study on the UK's PFI system and the improvement of Korean BTL programme	*	KSPR
74	2006	Building and managing facilities for public services	Bennett, J; Iossa, E.	JPE
75	2006	Portsmouth's pioneering highways management contract, UK	Finch, A.	PICE-ME
76	2006	Opportunities for nurses in a private finance initiative	Gittoes, P; Trim, JC.	NT
77	2006	A study on the legislation and the reform of legal system for revitalization of project financing	Park, S.	JCPL
78	2005	Does the private finance initiative promote innovation in health care? the case of the British national health service	Petratos, P.	JMP
79	2005	Costs and benefits of private finance initiative schemes.	Gittoes, P; Trim, J.	NT
80	2005	Can integrated solutions business models work in construction?	Brady, T; Davies, A; Gann, D.	BRI
81	2005	Operational experience from a small footprint lamella and baff plant in Aberdeen	Jolly, M.	WEJ
82	2005	Independently verified reductionism: prison privatization in Scotland	Cooper, C; Taylor, P.	HR
83	2005	Risk transfer and the UK private finance initiative: a theoretical analysis	Lonsdale, C.	PP
84	2005	Post-contractual lock-in and the UK private finance initiative (PFI): the cases of national savings and investments and the lord chancellor's department	Lonsdale, C.	PA
85	2005	An institutional theory perspective on the UK's private finance initiative (PFI) accounting standard setting process	Khadaroo, MI.	PMR
86	2005	Public contracts related to privatization of governmental functions : focusing on contracting-out & public private partnership	*	ALJ
87	2004	Room for improvement.	Rayfield, J.	HE
88	2004	Therapy by design: evaluating the UK hospital building program	Gesler, W; Bell, M; Curtis, S; Hubbard, P; Francis, S.	HP
89	2004	Reporting PFI in annual accounts: a user's perspective	Hodges, R; Mellett, H.	PMM
90	2004	A building maintenance decision tool for PFI projects	Khosrowshahi, F; Howes, R; Aouad, G.	CDVEP
91	2003	Private finance initiative and public-private partnerships - abstracts	**	PICE-T
92	2003	The private finance initiative: risk, uncertainty and the state	Froud, J.	AOS
93	2003	Controlling the PFI process in schools: a case study of the pimlico project	Edwards, P; Shaoul, J.	PP
94	2003	PFI, public-private partnerships and the neglected importance of process: stakeholders and the employment dimension	Fischbacher, M; Beaumont, PB.	PMM
95	2003	Information, trust and the private finance initiative in social housing	Grubnic, S; Hodges, R.	PMM
96	2003	Downsizing of acute inpatient beds associated with private finance initiative: Scotland's case study	Dunnigan, MG; Pollock, AM.	BMJ

97	2003	A study on the introduction plan of "private finance initiative (PFI)" for a controversial solution of public works	*	HS
98	2002	Private financing of transport infrastructure - an assessment of the UK experience	Debande, O.	JTEP
99	2002	Establishing a contract for a pacs managed service	Pilling, JR.	CR
100	2002	The private finance initiative and public sector finance	Ball, R; Heafey, M; King, D.	EPCP
101	2001	Learning through partnership: private finance and management in the delivery of services for London	Wakeford, J; Valentine, J.	PMM
102	2001	Substance, form and PFI contracts	Kirk, RJ; Wall, AP.	PMM
103	2001	Private finance initiative - a good deal for the public purse or a drain on future generations?	Ball, R; Heafey, M; King, D.	PP
104	2000	Acquiescence and opposition: the private finance initiative in the national health service	Ruane, S.	PP
105	1999	PFI in the sky, or pie in the sky? - privatising military space	McLean, A.	SP
106	1999	The Nottingham express transit PFI project	Armstrong, PJ.	PICE-ME
107	1999	Past abuses and future uses of private finance and public private partnerships in transport	Glaister, S.	PMM
108	1999	Infrastructure shortfall in the United Kingdom: the private finance initiative and government policy	Clark, GL; Root, A.	PG
109	1999	Commercialising the management and maintenance of trunk roads in the United Kingdom	Haynes, L; Roden, N.	TRANSPORTATION PA
110	1999	The new public service ethos: an ethical environment for governance	Brereton, M; Temple, M.	PA
111	1999	Pump-priming the PFI: why are privately financed hospital schemes being subsidized?	Gaffney, D; Pollock, AM.	PMM
112	1998	The private finance initiative and the changing governance of the built environment	Kerr, D.	US
113	1998	The private finance initiative - public private partnerships	Grubb, SRT.	PICE-CE
114	1998	The private finance initiative: local authority transport programmes	Hagan, A.	PICE-ME
115	1998	PFI - the last chance saloon?	Tiffin, M; Hall, P.	PICE-CE
116	1997	The economics of the private finance initiative	Grout, PA.	OREP
117	1997	Accounting for the private finance initiative	Heald, D; Geaghan, N.	PMM
118	1997	A commissioner's tale: avery hill student village, university of Greenwich	McWilliam, J.	PMM
119	1996	The private finance initiative - overdue reform or policy breakthrough?	Terry, F.	PMM
120	1995	The private finance initiative	Hancock, D.	PICE-ME

* author's name written in other language

** anonymous

S.3 Summary of Brazilian' PPP projects.

PPP projects identified in the Brazilian states governments, classified by title, project sector, type of project, type of concession and actual phase.

The projects were sorted from the Brazilians' states alphabetic order:

Number	State	Title	Project Sector	Project Type	Concession Type	Project Phase
1	Alagoas	Sistema Adutor do Agreste	Environment	Water Supply System	Administrative	Contract in Operation
2	Alagoas	Centro Integrado de Ressocialização	Security	Prison Units	Administrative	EOI
3	Alagoas	Facilita Cidadão	Administration	Citizens Services Centers	Administrative	USP
4	Alagoas	VLT Região Metropolitana de Maceió	Transportation	Light Rails	?	USP
5	Alagoas	Sistema Adutor do Agreste	Environment	Sewerage system	Administrative	Contract in Operation
6	Alagoas	Veículo Leve sobre Trilhos – VLT (Maceió – Aeroporto)	Transportation	Light Rails	Sponsored	EOI
7	Alagoas	Sistema de Esgotamento Sanitário no Município de Maceió	Environment	Sewerage system	Administrative	USP
8	Amazonas	Hospital da Zona Norte de Manaus	Health	Hospitals and Health Centers	Administrative	Contract in Operation
9	Amazonas	Complexo Presidiário	Security	Prison Units	Administrative	Contract Signed but Non-Operational
10	Amazonas	Central de Material Esterilizado	Health	Hospitals and Health Centers	Administrative	Contract in Operation
11	Bahia	Arena Fonte Nova	Sports	Stadiums and Sports Facilities	Administrative	Contract in Operation
12	Bahia	Hospital do Subúrbio	Health	Hospitals and Health Centers	Administrative	Contract in Operation
13	Bahia	Instituto Couto Maia	Health	Hospitals and Health Centers	Administrative	Contract in Operation
14	Bahia	Projeto Emissário Submarino	Environment	Sewerage system	Administrative	Contract in Operation
15	Bahia	Metrô de Salvador e Lauro de Freitas (SMSL)	Transportation	Subway	Sponsored	Contract in Operation
16	Bahia	Plataforma Logística São Francisco	Transportation	Ports and Waterways	?	Project Appraisal
17	Bahia	Diagnóstico por Imagem	Health	Hospitals and Health Centers	Administrative	Contract in Operation
18	Bahia	Projeto Sistema Rodoviário BA052 (Estrada do Feijão)	Transportation	Highways and Urban Roads	?	Project Appraisal
19	Bahia	Procedimento de Manifestação de Interesse para Gestão e Gerenciamento de Resíduos Sólidos Urbanos	Environment	Sewerage system	?	USP
20	Ceará	Central de Cogeração de Energia para o Centro de Eventos do Ceará	Energy	Power Generation Plants	Administrative	EOI
21	Ceará	Estádio Castelão	Sports	Stadiums and Sports Facilities	Administrative	Contract in Operation
22	Ceará	Hospital Regional Metropolitano do Ceará	Health	Hospitals and Health Centers	Administrative	Contract Signed but Non-Operational
23	Ceará	Arco Rodoviário Metropolitano de Fortaleza	Transportation	Highways and Urban Roads	?	EOI
24	Ceará	Metrô de Fortaleza - Linha Leste	Transportation	Subway	Sponsored	EOI

25	Ceará	Terminal Intermodal de Cargas do Porto do Pecém	Transportation	Ports and Waterways	?	EOI
26	Ceará	Centro Cultural	Tourism	Building management	?	EOI
27	Ceará	Complexo de Alta Segurança do Estado do Ceará	Security	Prison Units	Administrative	EOI
28	Ceará	Rodovias Estaduais CE-040, CE-060, CE-085	Transportation	Highways and Urban Roads	?	EOI
29	Ceará	Trem do Cariri	Transportation	Railways	Sponsored	EOI
30	Ceará	Unidades Socioeducativas para Adolescentes em Conflito com a Lei Vapt-Vupt	Security	Prison Units	Administrative	EOI
31	Ceará	Vapt-Vupt	Administration	Citizens Services Centers	Administrative	Contract in Operation
32	Ceará	Ponte Estaiada sobre o Rio Cocó	Transportation	Bridges, Tunnels and Viaducts	Administrative	Contract Signed but Non-Operational
33	Distrito Federal	Jardins Mangueiral	Housing and Urban Development	Housing	Administrative	Contract in Operation
34	Distrito Federal	Centro Administrativo do Distrito Federal	Administration	Building management	Administrative	Contract in Operation
35	Distrito Federal	CGI Centro de Gestão Integrada	Security	Building management	Administrative	Contract Signed but Non-Operational
36	Distrito Federal	Saída Norte	Transportation	Highways and Urban Roads	Administrative	EOI
37	Distrito Federal	Programas Habitacionais: Setor Meireles e Jardins Mangueiral - parte II	Housing and Urban Development	Housing	Administrative	EOI
38	Distrito Federal	Estacionamentos na Região Central de Brasília (Subterrâneos na Esplanada dos Ministérios)	Transportation	Parking and Garages	Administrative	EOI
39	Distrito Federal	Resíduos Sólidos Urbanos - Brasília	Urban services	Urban Cleansing	?	Project Appraisal
40	Distrito Federal	Sistema Adutor Paranoá	Environment	Water Supply System	?	Project Appraisal
41	Distrito Federal	Centro Esportivo de Brasília	Sports	Stadiums and Sports Facilities	?	EOI
42	Distrito Federal	Centro Médico da PMDF	Health	Hospitals and Health Centers	Administrative	EOI
43	Distrito Federal	Infraestrutura viária, aeroportuária, de mobilidade urbana e de logística	Transportation	Airports	?	Project Appraisal
44	Distrito Federal	Saúde	Health	Hospitals and Health Centers	Administrative	Bidding
45	Distrito Federal	Relógios Digitais	Urban services	Urban Furniture	?	Bidding
46	Distrito Federal	Centrais de Atendimento Integrado de Serviços Públicos aos Cidadãos do Distrito Federal - Na Hora	Administration	Citizens Services Centers	Administrative	EOI
47	Distrito Federal	Sistema Penitenciário do Distrito Federal	Security	Prison Units	Administrative	EOI
48	Distrito Federal	Transbrásilia	Transportation	Highways and Urban Roads	Administrative	EOI
49	Distrito Federal	Parque da Cidade Dona Sarah Kubitschek	Tourism	Building management	?	Project Appraisal
50	Distrito Federal	Torre de TV de Brasília	Tourism	Building management	?	Project Appraisal
51	Distrito Federal	Mirante Flor do Cerrado	Tourism	Building management	?	USP
52	Distrito Federal	Centro de Convenções Ulysses Guimarães	Tourism	Building management	?	Project Appraisal

53	Distrito Federal	Iluminação Pública	Urban services	Urban Furniture	?	EOI
54	Distrito Federal	Jardim Zoológico de Brasília	Tourism	Building management	?	Project Appraisal
55	Distrito Federal	Shopping Popular	Business	Building management	?	Project Appraisal
56	Distrito Federal	Parque de Exposições Agropecuárias da Granja do Torto	Business	Building management	?	Project Appraisal
57	Distrito Federal	Parque Tecnológico Capital Digital	Economic Development	Building management	?	Project Appraisal
58	Espírito Santo	Esgotamento Sanitário do Município de Serra	Environment	Sewerage system	Administrative	Contract in Operation
59	Espírito Santo	Sistema Hidroviário no Estuário da Baía de Vitória	Transportation	Ports and Waterways	?	Public Consultation
60	Espírito Santo	Hospital Estadual Infantil	Health	Hospitals and Health Centers	Administrative	EOI
61	Espírito Santo	Identidade ES	Security	Citizens Services Centers	Administrative	Public Consultation
62	Espírito Santo	Núcleos Administrativos do Governo do Espírito Santo	Administration	Building management	Administrative	Project Appraisal
63	Espírito Santo	Rede Faça Fácil	Administration	Citizens Services Centers	Administrative	Contract in Operation
64	Espírito Santo	CEMMC Centro de Eventos Multiuso das Montanhas Capixabas	Tourism	Building management	?	EOI
65	Espírito Santo	Prip (Programa de Reestruturação dos Imóveis Públicos)	Administration	Building management	Administrative	Project Appraisal
66	Espírito Santo	Unidades Escolares	Education	Teaching Units	Administrative	EOI
67	Goiás	VLT Goiânia - Eixo Anhanguera	Transportation	Light Rails	Sponsored	Contract Signed but Non-Operational
68	Goiás	Complexo Prisional Odenir Guimarães	Security	Prison Units	Administrative	Public Consultation
69	Goiás	Rodovias GO-020, GO-060, GO-070 e GO-080.	Transportation	Highways and Urban Roads	Sponsored	EOI
70	Goiás	Vapt Vupt	Administration	Citizens Services Centers	?	USP
71	Mato Grosso	Hospital Infantil do Mato Grosso	Health	Hospitals and Health Centers	Administrative	Public Consultation
72	Mato Grosso	Ganha Tempo (Identificação Digital)	Administration	Citizens Services Centers	Administrative	Bidding
73	Mato Grosso	GESTÃO ESCOLAR	Education	Teaching Units	Administrative	EOI
74	Mato Grosso	Complexo Penitenciário	Security	Prison Units	?	EOI
75	Mato Grosso do Sul	Aquário do Pantanal	Tourism	Building management	?	Project Appraisal
76	Mato Grosso do Sul	Hospitais na Área de Fronteira Internacional	Health	Hospitals and Health Centers	?	Project Appraisal
77	Mato Grosso do Sul	Presídios	Security	Prison Units	?	Project Appraisal
78	Mato Grosso do Sul	Unidades de Conservação	Tourism	Conservation units	?	Project Appraisal
79	Mato Grosso do Sul	Rede de esgoto nos municípios de Mato Grosso do Sul atendidos pela Sanesul	Environment	Sewerage system	Administrative	EOI
80	Minas Gerais	Complexo Penal de Ribeirão das Neves	Security	Prison Units	Administrative	Contract in Operation
81	Minas Gerais	Novo Mineirão	Sports	Stadiums and Sports Facilities	Administrative	Contract in Operation
82	Minas Gerais	Rodovia MG-050	Transportation	Highways and Urban Roads	Sponsored	Contract in Operation
83	Minas Gerais	Unidades de Atendimento	Administration	Citizens Services Centers	Administrative	Contract in Operation

Integrado (UAI) - Fase I						
84	Minas Gerais	Ampliação do Sistema Produtor Rio Manso	Environment	Water Supply System	Administrative	Contract in Operation
85	Minas Gerais	Aeroporto da Zona da Mata ARZM	Transportation	Airports	Sponsored	Contract in Operation
86	Minas Gerais	Centro Empresarial Gameleira	Economic Development	Building management	Administrative	Public Consultation
87	Minas Gerais	Entorno Viário da Cidade Administrativa	Transportation	Highways and Urban Roads	Administrative	Public Consultation
88	Minas Gerais	Campus da UEMG	Education	Building management	Administrative	Project Appraisal
89	Minas Gerais	Contorno Metropolitano Leste	Transportation	Highways and Urban Roads	?	EOI
90	Minas Gerais	Contorno Metropolitano Norte	Transportation	Highways and Urban Roads	Sponsored	Bidding
91	Minas Gerais	Sede do DETRAN/MG	Transportation	Building management	Administrative	EOI
92	Minas Gerais	Pátios DETRAN/MG	Transportation	Removal and storage of vehicles	Administrative	EOI
93	Minas Gerais	Fábrica de Placas DETRAN/MG	Transportation	Citizens Services Centers	Administrative	Public Consultation
94	Minas Gerais	CFCri-Centor de Ciências Forenses Criminais de Minas Gerais	Transportation	Building management	Administrative	EOI
95	Minas Gerais	Resíduos Sólidos	Environment	Sewerage system	Administrative	Contract in Operation
96	Minas Gerais	UAI Fase II	Administration	Citizens Services Centers	Administrative	Contract in Operation
97	Minas Gerais	UAI Fase III - Praça sete	Administration	Citizens Services Centers	Administrative	Contract in Operation
98	Minas Gerais	Sistema de Esgotamento Sanitário de Divinópolis	Environment	Sewerage system	Administrative	Contract in Operation
99	Minas Gerais	Expominas II	Business	Building management	Administrative	Bidding
100	Minas Gerais	Projeto Nova Metrópole: Transportation sobre Trilhos	Transportation	Railways	Administrative	EOI
101	Minas Gerais	ROTA LUND	Tourism	Conservation units	Administrative	Bidding
102	Minas Gerais	Centro de Terinamento Aeroespacial - CTCA	Education	Building management	Administrative	EOI
103	Minas Gerais	Escolas Estaduais	Education	Building management	Administrative	EOI
104	Minas Gerais	Aeroporto Usiminas	Transportation	Airports	Sponsored	Public Consultation
105	Minas Gerais	Estradas Estaduais	Transportation	Highways and Urban Roads	?	EOI
106	Pará	Plataforma Logística do Guamá	Transportation	Ports and Waterways	?	USP
107	Pará	RODOVIA LIBERDADE	Transportation	Highways and Urban Roads	Sponsored	USP
108	Pará	SANEAMENTO REGIÃO METROPOLITANA DE BELÉM	Environment	Sewerage system	?	USP
109	Pará	IMPLANTAÇÃO DE ESCOLAS	Education	Teaching Units	?	Project Appraisal
110	Pará	CENTRAL DE DIAGNÓSTICOS POR IMAGEM	Health	Hospitals and Health Centers	?	USP
111	Pará	SANEAMENTO REGIÃO METROPOLITANA DE BELÉM	Environment	Sewerage system	?	USP
112	Paraíba	Centro Administrativo da Paraíba	Administration	Building management	?	USP
113	Paraíba	Arenas Multiuso	Sports	Stadiums and Sports Facilities	?	Project Appraisal
114	Paraíba	Centros de Ressocialização	Security	Prison Units	?	Project Appraisal
115	Paraíba	Complexo Rodoviário João Pessoa - BR-101	Transportation	Highways and Urban Roads	?	Project Appraisal

116	Paraíba	Condomínios e Complexos Industriais	Economic Development	Building management	?	Project Appraisal
117	Paraíba	Infraestrutura Turística	Tourism	Building management	?	Project Appraisal
118	Paraíba	Novo Porto Marítimo (offshore)	Transportation	Ports and Waterways	?	Project Appraisal
119	Paraíba	Perímetros Irrigados para o Agronegócio	Agriculture and Irrigation	Irrigation	?	Project Appraisal
120	Paraíba	Porto de Cabedelo	Transportation	Ports and Waterways	?	Project Appraisal
121	Paraíba	Porto Seco da Região do Compartimento da Borborema	Foreign trade	Ports and Waterways	?	Project Appraisal
122	Paraíba	Requalificação da Malha Ferroviária Estadual	Transportation	Railways	?	Project Appraisal
123	Paraíba	Sistemas de Água e Esgoto	Environment	Water Supply System	?	Project Appraisal
124	Paraíba	Terminais Rodoviários	Transportation	Building management	?	Project Appraisal
125	Paraíba	Trens Urbanos da Grande João Pessoa	Transportation	Light Rails	?	Project Appraisal
126	Paraíba	Unidades Hospitalares	Health	Hospitals and Health Centers	?	Project Appraisal
127	Paraíba	Zona de Processamento de Exportações Campina Grande	Foreign trade	Building management	?	Project Appraisal
128	Paraná	Rodovia PR-323	Transportation	Highways and Urban Roads	Sponsored	Contract in Operation
129	Paraná	Corredores Integrados do Norte	Transportation	Highways and Urban Roads	?	EOI
130	Paraná	Caminhos do Sudoeste	Transportation	Highways and Urban Roads	?	EOI
131	Paraná	Ampliação da rede de distribuição da COMPAGÁS	Gas	Gas supply	?	EOI
132	Paraná	Sistema de Controle e Monitoramento de Veículos	Transportation	Citizens Services Centers	?	EOI
133	Paraná	Centrais de Abastecimento do Estado (CEASA)	Food Supply	Building management	?	EOI
134	Paraná	Projeto "Tudo Aqui"	Administration	Citizens Services Centers	?	EOI
135	Paraná	RECUPERAÇÃO, MODERNIZAÇÃO E OPERAÇÃO DOS CEASAS	Food Supply	Building management	Administrative	Project Appraisal
136	Paraná	IDENTIFICAÇÃO VEICULAR	Transportation	Citizens Services Centers	Sponsored	Project Appraisal
137	Paraná	CORREDOR SUDOESTE - PR280 - LOTE 11	Transportation	Highways and Urban Roads	Sponsored	Project Appraisal
138	Paraná	SISTEMA INTEGRADO DE INTELIGÊNCIA E CONTROLE	Security	Building management	Administrative	EOI
139	Paraná	PROJETO PPP HOSPITAL DA POLÍCIA MILITAR	Health	Hospitals and Health Centers	Administrative	Project Appraisal
140	Paraná	TREM PÉ-VERMELHO	Transportation	Railways	Sponsored	EOI
141	Paraná	PPP DE DIAGNÓSTICO POR IMAGEM	Health	Hospitals and Health Centers	Administrative	EOI
142	Pernambuco	Complexo Viário da Praia do Paiva	Transportation	Bridges, Tunnels and Viaducts	Sponsored	Contract in Operation
143	Pernambuco	CIR Centro Integrado de Ressocialização de Itaquitinga	Security	Prison Units	Administrative	Contract Termination
144	Pernambuco	(Programa Cidade Saneada) Sistema de Esgotamento Sanitário da RMR e Goiana	Environment	Sewerage system	Administrative	Contract in Operation

145	Pernambuco	Arena Multiuso da Copa 2014	Sports	Stadiums and Sports Facilities	Administrative	Contract in Operation
146	Pernambuco	Campus Integrado da Universidade de Pernambuco	Education	Building management	?	Project Appraisal
147	Pernambuco	Sede da Polícia Científica da Capital	Security	Building management	?	Project Appraisal
148	Pernambuco	Litoral Norte - Duplicação da PE-001	Transportation	Highways and Urban Roads	Sponsored	EOI
149	Pernambuco	Nova Sede do Tribunal de Justiça do Estado e Fórum Criminal do Recife	Justice	Building management	?	EOI
150	Pernambuco	Rota do Capiberibe - Radial da Copa 2014	Transportation	Highways and Urban Roads	?	EOI
151	Pernambuco	Autoprodução de Energia Elétrica na Administração Pública	Energy	Power Generation Plants	?	Project Appraisal
152	Piauí	Rota da Soja	Transportation	Highways and Urban Roads	Sponsored	USP
153	Piauí	Anjo da Guarda	Research and Technology	Citizens Services Centers	?	EOI
154	Piauí	Central de Abastecimento do Piauí – Teresina	Food Supply	Building management	Administrative	EOI
155	Piauí	Complexo Turístico Litoral do Piauí	Tourism	Building management	Administrative	EOI
156	Piauí	Nosso Shopping	Administration	Citizens Services Centers	?	USP
157	Piauí	Novo Centro Administrativo	Administration	Building management	?	Project Appraisal
158	Piauí	Plataforma Logística Multimodal	Transportation	Building management	?	USP
159	Piauí	Samenamento - municípios (Em breve)	Environment	Sewerage system	?	Project Appraisal
160	Piauí	Piauí Conectado	Research and Technology	Citizens Services Centers	?	USP
161	Rio de Janeiro	Complexo do Maracanã	Sports	Stadiums and Sports Facilities	Administrative	Contract in Operation
162	Rio de Janeiro	Linha 3 - Rio de Janeiro	Transportation	Subway	?	Project Appraisal
163	Rio de Janeiro	Saneamento nas Regiões da Baixada Fluminense/Bacia do Guandu e Região do Leste Metropolitano Fluminense	Environment	Water Supply System	?	EOI
164	Rio Grande do Norte	Arena das Dunas	Sports	Stadiums and Sports Facilities	Administrative	Contract in Operation
165	Rio Grande do Norte	Aterro Sanitário do Vale do Assu	Urban services	Urban Cleansing	?	EOI
166	Rio Grande do Norte	Centrais de Abastecimento do Estado (CEASA)	Food Supply	Building management	?	Project Appraisal
167	Rio Grande do Sul	Anel Rodoviário Metropolitano entre Porto Alegre e Novo Hamburgo	Transportation	Highways and Urban Roads	?	USP
168	Rio Grande do Sul	Rodovia ERS-010	Transportation	Highways and Urban Roads	?	EOI
169	Rio Grande do Sul	Complexo Prisional da Região Metropolitana	Security	Prison Units	?	EOI
170	Rio Grande do Sul	Modernização do Centro Administrativo Fernando Ferrari	Administration	Building management	?	EOI
171	Rio Grande do Sul	Irrigação da Bacia do Rio Santa Maria	Agriculture and Irrigation	Irrigation	?	EOI
172	Rio Grande do Sul	Saneamento da Bacia do Gravataí	Environment	Sewerage system	?	EOI
173	Rondônia	HEURO Hospital de Urgência e Emergência de Rondônia	Health	Hospitals and Health Centers	Administrative	EOI
174	Rondônia	Saneamento Básico	Environment	Sewerage system	Administrative	EOI

175	Santa Catarina	Acesso à Ilha de Santa Catarina - BR 101	Transportation	Bridges, Tunnels and Viaducts	?	EOI
176	Santa Catarina	Mobilidade Urbana e de Acesso a Florianópolis	Transportation	Highways and Urban Roads	?	EOI
177	Santa Catarina	Centrais de Atendimento ao Cidadão	Administration	Citizens Services Centers	Administrative	EOI
178	Santa Catarina	Tecnologia Digital na Rede Estadual de Ensino	Education	Educational support	?	USP
179	Santa Catarina	Sistema de BRT	Transportation	Highways and Urban Roads	?	EOI
180	São Paulo	Metrô de São Paulo - Linha 4 - Amarela	Transportation	Subway	Sponsored	Contract in Operation
181	São Paulo	Metrô de São Paulo - Linha 8 - Diamante	Transportation	Subway	Administrative	Contract in Operation
182	São Paulo	Sistema Produtor do Alto Tietê / ETA Tietê Taiaçupeba	Environment	Water Supply System	Administrative	Contract in Operation
183	São Paulo	Sistema Produtor de São Lourenço	Environment	Water Supply System	Administrative	Contract in Operation
184	São Paulo	Metrô de São Paulo - Linha 6 - Laranja	Transportation	Subway	Sponsored	Contract in Operation
185	São Paulo	Complexos Hospitalares	Health	Hospitals and Health Centers	Administrative	Contract in Operation
186	São Paulo	Habitação - Lote 1	Housing and Urban Development	Housing	Administrative	Contract in Operation
187	São Paulo	FURP – Planta de Produção Américo de Brasiliense	Health	Housing	Administrative	Contract in Operation
188	São Paulo	Rodovia dos Tamoios	Transportation	Highways and Urban Roads	Sponsored	Contract in Operation
189	São Paulo	SIM - Sistema Integrado Metropolitano da RMBS (modal VLT)	Transportation	Subway	Sponsored	Contract in Operation
190	São Paulo	Metrô de São Paulo - Linha 18 - Bronze	Transportation	Subway	Sponsored	Contract in Operation
191	São Paulo	Linha 08 Diamante e Linha 09 Esmeralda de Trens metropolitanos	Transportation	Subway	Sponsored	Project Appraisal
192	São Paulo	Parceria Habitação Fazenda Albor	Housing and Urban Development	Housing	Administrative	Public Consultation
193	São Paulo	PPP para Provisão de Habitações de Interesse Social e Habitações de Mercado Popular no Centro da Cidade de SP	Housing and Urban Development	Housing	Administrative	Project Appraisal
194	São Paulo	Complexos Prisionais	Security	Prison Units	Administrative	Project Appraisal
195	São Paulo	Construção e Gestão de Fóruns	Justice	Building management	Administrative	Project Appraisal
196	São Paulo	Expresso ABC - Linha 10 Turquesa	Transportation	Subway	Sponsored	Project Appraisal
197	São Paulo	Expresso Bandeirantes	Transportation	Railways	Sponsored	Project Appraisal
198	São Paulo	Identificação Digital	Security	Citizens Services Centers	?	Project Appraisal
199	São Paulo	Metrô de São Paulo - Linha 20 - Rosa	Transportation	Subway	Sponsored	Project Appraisal
200	São Paulo	Trens Intercidades	Transportation	Railways	?	Project Appraisal
201	São Paulo	Pátio Veicular Integral	Administration	Removal and storage of vehicles	Administrative	EOI
202	São Paulo	Portal São Paulo - Requalificação do Acesso ao Aeroporto de Guarulhos	Housing and Urban Development	Urban Development	Sponsored	Project Appraisal
203	São Paulo	Saneamento no Vale do Juqueri	Environment	Sewerage system	Administrative	Project Appraisal

204	Sergipe	PPP da Área de Saúde	Health	Hospitals and Health Centers	?	EOI
205	Sergipe	PPP do Centro Administrativo	Administration	Building management	?	EOI

(?) Projects that the type of concessions was not informed by the PPP units in the questionnaires answers or not available in their websites' database.