

# PPP infrastructure investments in Brazil: Establishing stylized facts

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**Abstract:** Public-private partnerships (PPPs) were established in Brazil at the beginning of this century, following a global trend of using these partnerships to stimulate investment in infrastructures, particularly in a framework of restrictive budgetary and fiscal conditions. Despite their growing importance and the expectation of an expanding role in the future, not much is known about the actual facts on the ground. The objective of this paper is to be a first step in the direction of filling this information gap by providing important stylized facts about the universe of PPPs in Brazil: the quantitative evolution of PPP adoptions; the characterization of the geographical distribution of PPPs by government level (federal, state, district, and municipal); the characterization of the PPP intervention areas, including the total value of contracts and the modalities of PPP concession (sponsored and administrative). This objective is rendered possible by the development of a new database that covers the entire process of PPP contracting from 2005 to 2022, including the opening of public consultation procedures, the publication of the official notice, and the signing of contracts, as well as multiple thematic, financial, jurisdictional, and regional indicators. In turn, we see the establishment of these stylized facts as a necessary first step in the direction of understanding the factors that may determine or condition their adoption. In general, having a clear picture of the universe of the PPPs in Brazil is fundamental as their use and their role are expected to significantly increase in the future as the country pursues a path of improved economic activity and well-being of the population.

**Keywords:** public-private partnerships; Brazil; number, value and areas of intervention of PPP contracts; regional and jurisdictional distribution of PPP contracts

## 1. Introduction

Brazil, although the largest country in Latin America in terms of income and territory, stands out as one of the countries in the region with the lowest ratios of investment in infrastructures to GDP (Carvalho and Reyes-Tagle, 2022). Public-private partnerships (PPPs), presented as the solution to the lack of public investment in infrastructure in the country (Nakamura, 2019), were instituted in the early years of this century in Brazil. 30 December 2004 marks the institutional and legal advent of the national PPP law (Law No. 11.079/2004). Two decades later Brazil is the country with the largest share of PPPs in Latin America and the Caribbean.

PPPs are contractual agreements established between the public and private sectors with the aim of leveraging investments in infrastructure and public services (Cruz and Sarmiento, 2019; Davies and Fairbrother, 2003; Flinders, 2005; Osei-Kyei and Chan, 2015; Yescombe and Farquharson, 2018). These partnerships generally represent a cooperation agreement between the public and private sectors, which mainly aim to optimize public and private resources (Hodge and Greve, 2019; Lewis, 2021; Steinfeld, 2023). The key goal of PPP is to deliver an efficient service that

neither the public nor the private sector could do alone (Batjargal and Zhang, 2022). On the one hand, PPPs, in addition to being an alternative tool for public provision, are also a political tool, either to limit public sector debt, due to the unavailability of public funding, or to secure long-term projects efficiently, for example, on time and on budget (Hodge et al., 2018). On the other hand, PPPs offer the private sector investment opportunities and new markets that were previously mostly the domain of the state (Winch et al., 2012). Finally, by taking over the public-private resource, the state is expected to achieve the best results at the lowest possible cost (Cruz and Sarmiento, 2019).

The first PPP experiences in Brazil emerged within the scope of the 2005 Pilot Investment Project, a project launched by the federal government to carry out priority public infrastructure works and evaluate a new system for monitoring the execution and measurement of economic benefits. Although some Brazilian federative entities, including Minas Gerais, Santa Catarina, and São Paulo, already had in place legal frameworks for contracting before the promulgation of the national PPP law in late 2004, they needed to adjust their legislation in accordance with this law in order to advance with the contracts. Most jurisdictions, however, had to create their specific legislation.

In Brazil, PPPs are legally presented as a form of public service concession. This is a way for governments to engage the cooperation of the private sector in order to combine financial, legal, administrative, and operational management resources to stimulate investment in infrastructure to enhance economic performance and the well-being of the population, as well as improving and expanding public infrastructure assets and services (Batjargal and Zhang, 2022). Regardless of the degree of involvement of the private sector these are always investment activities stemming from the initiative of the public sector. The quest for such mechanisms based on achieving economic efficiency through private markets while achieving cost-effectiveness for the government is important in general, and it is even more so in the presence of restrictive budgetary and fiscal conditions (Flinders, 2005, 2010; Hellowen, 2010).

PPP contracts correspond to two types of administrative concessions: sponsored and administrative concessions, with the mode of remuneration from the public sector to the private sector as one of the central elements that distinguish between the two (see, Di Pietro (2017)), for a theoretical and legal approach to the two types of PPPs). In sponsored concessions, the public sector's financial payments are combined with the revenues from the charge of the user's fee. In the case of administrative concessions, the granting authority is responsible for total remuneration to the private sector, with payment only commencing upon the start of service provision. In general, remuneration is tied to the quantity and quality of services provided.

This instrument for implementing public policies (Dias, 2014) must be compatible with the amortization of investments made, with a minimum term of five and a maximum of thirty-five years. However, the establishment of the maximum term does not prevent the contract from being extended for the recovery of investments made by the private partner. On the other hand, since the end of 2017,

there has been a new minimum contracting value for PPPs, which is R\$10 million (Di Pietro, 2017).

The national legal framework for PPPs established that the adoption of PPP contracts is within the powers of the Union, states, the Federal District, and municipalities. The adoption of PPPs in Brazil can, therefore, occur at multiple levels of government (DIB, 2017; Filho et al., 2020; Silva, 2015). The Brazilian federal government cannot interfere in the preparation, contracting, and execution of projects carried out by other executive bodies. Exceptionally, there may be an imposition of specific conditions when they receive resources from the federal government. However, since the PPP contracts are public, the national regulatory framework of these partnerships establishes different requirements and guidelines for their formalization. These include compliance with current bidding and contracting regulations; presentation of a technical study that supports the contract and the option for a PPP; preparation of contractual expense estimates based on the determinations of the Fiscal Responsibility Law; allocation of risk as defined by the national legal framework; and the formation of a partnership responsible for the implementation and management of the PPP.

Despite their growing importance in Brazil and the expectation of an expanding role in the future, not much is known about the actual facts on the ground about these PPPs. The objective of this paper is to be a first step in the direction of filling this information gap by providing important stylized facts about the universe of PPPs in Brazil: the quantitative evolution of PPP adoptions; the characterization of the geographical distribution of PPPs by government level (federal, state, district, and municipal); the characterization of the PPP intervention areas, including the total value of contracts and the modalities of PPP concession (sponsored and administrative). This objective is rendered possible by the development of a new database that covers the entire process of PPP contracting from 2005 to 2022, including the opening of public consultation procedures, the publication of the official notice, and the signing of contracts, as well as multiple thematic, financial, jurisdictional, and regional indicators. In turn, we see the establishment of these stylized facts about PPPs as a necessary first step in the direction of understanding the factors that may determine or condition their adoption.

This paper is organized as follows. In section two, we present the basic information about data sources and the most general facts on the ground. In section three we present the incidence of PPPs across the Grand Regions of Brazil and correlate it with physical, demographic and economic indicators. In section four we do the same considering now the incidence of PPPs by according to the level of sponsoring public jurisdiction. In section five we consider the characterization of contracted PPPs by area of intervention at the different jurisdictional levels. Finally, in section six, we offer a summary of the stylized facts identified in this study, discuss the limitations of the study, and address avenues for future research opened by the new PPP data set featured in the paper and the stylized facts we have identified.

## **2. PPP infrastructure investments in Brazil**

### **2.1. Data sources and key variables**

Data on PPPs was collected using information provided by the Brazilian private company Radar PPP. Established in 2014, this company provides consulting support on the concession market and PPPs in Brazil. Data collection involved access to a restricted part of the company's web archive called 'Radar de Projectos', where raw information is stored for the PPP contracts that have been celebrated.

The information collected to create this new data set includes for each PPP contract celebrated the following variables: the date of opening of public consultation; the date of publication of the notice; the date of contract signature; the level of government responsible for the contract; the location within the Major Regions, the states, and the municipalities; the contract value; and the area of intervention.

This information was, then, organized according to the regional location of the partnership and its public level of jurisdiction. To be noted, this way of organizing the data with a regional focus lends itself to the analysis of the different factors that may determine or condition the adoption of this model of infrastructure investment, as it is quite amenable to being matched with demographic, social, economic, budgetary, and political data.

From the perspective of the present paper, all of the PPP data presented in the figures and discussed in the text comes from this new data set derived from the raw data made available by Radar PPP.

### **2.2. The universe of PPP contracts in Brazil**

The database considers information on PPP contracts in Brazil between 2005 and 2022. It, therefore, covers a period of eighteen years. Although the first PPP contract procedures were initiated in 2005, the first PPP contracts were actually only celebrated in 2006.

The decentralized powers of the different federative units include the celebration of PPP contracts. As such, the dataset contains information at the various levels of government: the federal executive, the 26 states and the Federal District, which has a hybrid nature as it has characteristics of both a state and a municipality (Szklarowsky, 2001), and the 5568 municipalities. In addition, the Brazilian administrative territory is usually divided into five Grand Regions: North, Northeast, Center-West, Southeast, and South.

Between 2005 and 2022, there were a total of 223 PPPs contracted in Brazil at different levels of government. Municipalities and states, however, have the lion's share of PPP contracts. Indeed, of the total of PPP contracts, municipalities account for 69%, while states account for 30%. The other levels of government, district and federal, have very few contracts, just about 1% of the total. This indicates a broad participation of subnational governments in the development of PPP projects in Brazil.

The high concentration of PPPs at the municipal level is due to the broad competencies attributed to them in providing local public services and to the

territorial dimension of the country and the vast number of municipalities it includes. In fact, seen from the standpoint of the number of municipalities in Brazil, it is also clear that despite the dominant role overall of PPP celebrated at the municipal level, only a very small number of municipalities, less than 3%, actually engaged in PPP contracting activities.

It is also worth noting that the Brazilian federative pact “assigns a significant portion of governmental powers to the state and municipal levels of government” (Siqueira and Reyes-Tagle, 2017). For this reason, in particular, PPPs have advanced significantly in recent years, mainly at the municipal level, and in different areas of political intervention (e.g.: transport, health, sanitation, solid waste, prisons, among others). Possibly, this advance is justified due to regulatory policies in relevant areas (e.g.: sanitation, solid waste treatment and electricity). Added to this is the accumulation of experience by private actors and/or the success achieved with the first projects, in addition to fiscal pressure (Siqueira and Reyes-Tagle, 2017). The change in the minimum value of contracts, which went from R\$20 million to R\$10 million, could also justify the growth in PPP contracts in Brazil.

In Brazil, two types of PPP contracts have been celebrated. In the case of administrative PPP concessions, the government is responsible for any payments due to the private sector without necessarily involving the collection of a fee from the user. In the case of the sponsored PPP concession, the remuneration for the private sector comes in the form of both payments by the public sector and proceeds from the charge of user fees.

The most prevalent form of PPP contract in Brazil is the administrative type, accounting for 90% of all contracts celebrated and for 67% of the total value of all contracts. This indicates that the different instances of the public sector involved have committed themselves to a rather long stream of payments to the private sector in general, spanning several legislatures.

As to the sponsored type of PPP, it represents just 10% of the total number of PPP contracts. They account for 33% of the total value of the contracts, and as such, they also place a substantial burden on the public sector over time.

Given the long-term nature of the contracts, the financial burdens assumed by a given government with the PPPs will accumulate over many years and will carryover for future administrations. It is also important to note that most partnerships have a financial dimension that transcends the costs of construction, operation, and maintenance of infrastructure (Cruz and Sarmiento, 2019).

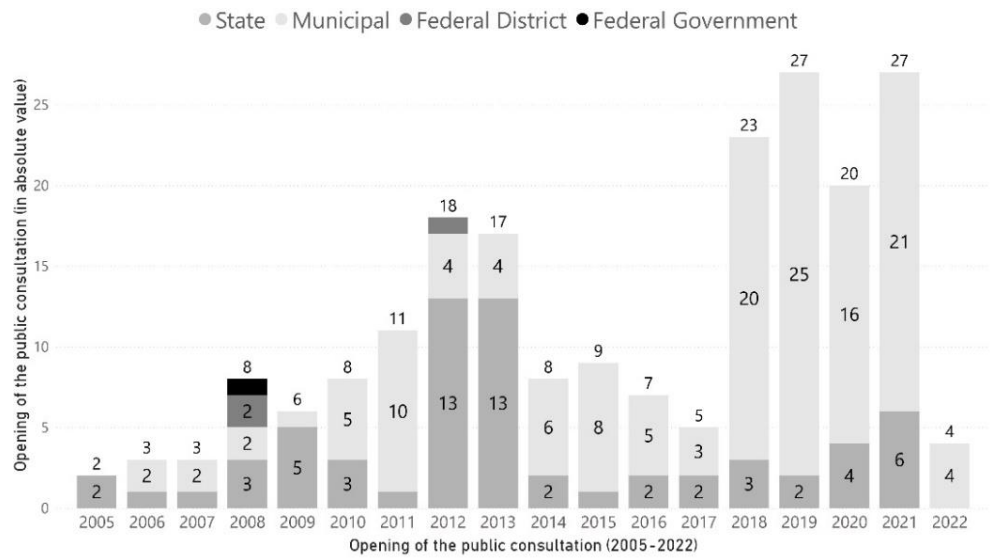
Between 2006, the first year in which PPP contracts were actually celebrated, and 2022, Brazilian governments at the different levels contracted a total value of R\$220 billion in the form of PPPs. To put things in perspective, this value, which was invested over a period of seventeen years, is equivalent to 2.7% of Brazil’s 2022 GDP (IBGE, 2024) or to an average of 0.16% of the yearly GDP over this time period.

### **2.3. The different steps of the PPP contracting process**

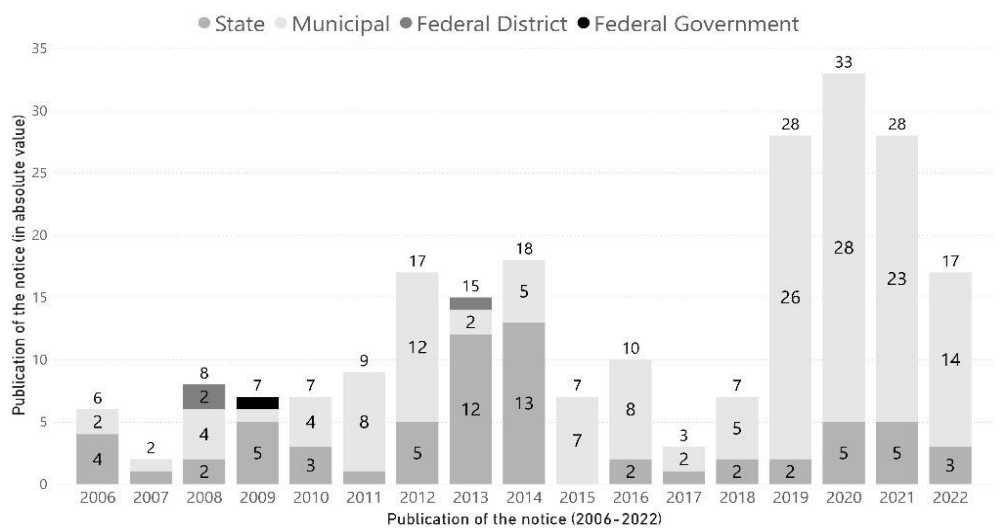
The signature of the PPP contract is the moment that effectively binds the executive to the responsibilities assumed by the private sector for the provision of

infrastructure and public services. The contract represents the legal tool for implementation of the partnership policy (Cossalter and Du Marais, 2001) and the instrument which frames the long-term public-private relationship (Cruz and Marques, 2012). However, there are procedures prior to the contractual signing, such as the opening of public consultations and the publication of the tender notice, which are also essential dates in triggering the celebration of these partnerships.

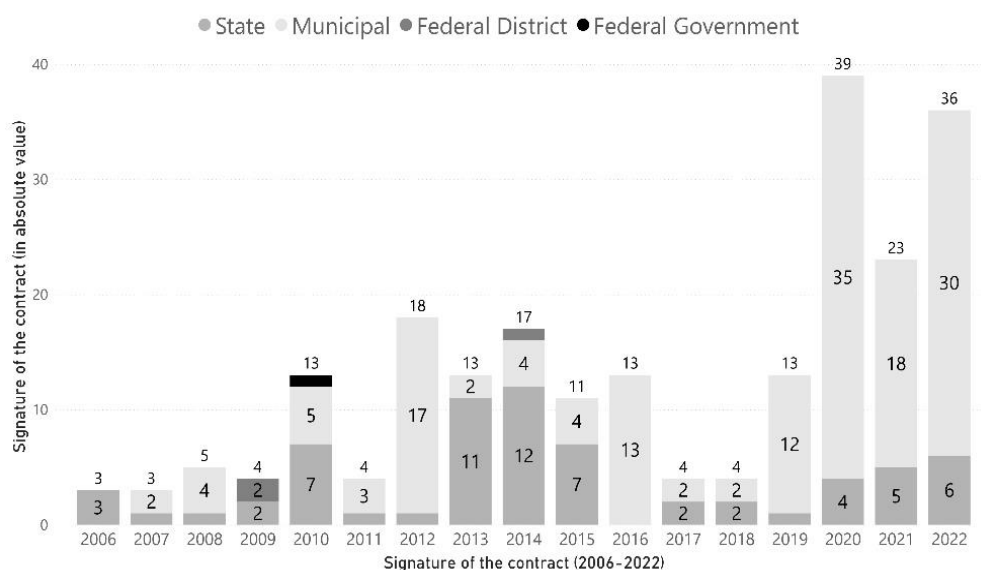
We now consider the evidence at these three key moments in the process of celebrating a PPP contract. The evolution of the openings of public consultations, the publications of the PPP tender notices, and the signature of the contracts are presented in **Figures 1–3**, respectively. In all cases, the information is broken down by the level of government conducting these procedures.



**Figure 1.** Opening of the PPPs public consultations.



**Figure 2.** Publication of the PPP tender notice.



**Figure 3.** Signature of the PPP contracts.

We start by presenting in detail the evolution of the publication of public consultations. Naturally, given their sequential nature, the evolution of the publication of the notices follows the opening of public consultations with a delay, and, in turn, it is followed by the signature of the PPP contract with a further delay. As such, the publication of the first PPP tender notices and the first contract signatures occurred in 2006, and the surges in the number of opening consultations are also reflected here in delayed surges in the number of published notices and contract signatures.

The evolution of the opening of the PPP consultations by level of government is presented in **Figure 1**. The total number of public consultation openings in this figure is 206, as it was not possible to determine the exact dating for two PPPs at the state level and fifteen at the municipal level. In several other cases, information about the dating of other procedures preceding this stage, such as public hearings, expressions of interest procedures, and public intention announcements, among others, helped fill many of the information gaps.

While the first instances of opening public consultation began in 2005, it took a few years for the number of consultations to pick up momentum. This is because although some federative entities, including Minas Gerais, Santa Catarina, and São Paulo, already had in place legal frameworks for contracting before the promulgation of the national PPP law in late 2004, most jurisdictions had to create their specific legislation.

In 2006, the states assumed a pioneering role in PPP contracting. São Paulo, Bahia, and Pernambuco were the precursors of these contracts in the transportation, sanitation, and highways sectors, respectively.

As for municipalities, the first instances of this procedure occurred in 2006. The municipalities of Rio Claro, a sanitation PPP, and Osasco, a solid waste PPP, both in São Paulo, are responsible for these early partnerships. In the same year, the public consultation for a PPP in the state of Pernambuco was also launched, adding up to three cases for 2006.

In 2008, the federal government conducted one public consultation procedure for the Datacenter Buildings Complex PPP, which is the only partnership contracted at this level of government until now. This investment integrated the building structure and management of data/information processing and storage services of the two most prominent financial institutions in the country (Banco do Brasil and Caixa Econômica Federal). In the same year, the Federal District carried out the first two of their three public consultation openings to date, the PPP for the Federal District Administrative Center and the Housing PPP—Jardins Mangueiral.

Finally, there was a significant surge in the openings of public consultations in the early 2010s, mainly at the state level and even more so in the period after 2018, in particular at the municipal level.

In 2007, Brazil was chosen as the host country for the 2014 FIFA World Cup. This is a relevant historical milestone due to the significant mobilization of Brazilian political actors to build or remodel football stadiums and their complementary infrastructures, boosting the number of contracts in this area. This occurrence also significantly altered the scenario of PPP contracting in the states and is reflected in the surge in the early 2010s.

The first four states to sign contracts for sports arenas in 2010 were Bahia (Arena Fonte Nova in Salvador), Ceará (Arena Castelão in Fortaleza), Pernambuco (Arena de Pernambuco in Recife), and Minas Gerais (Mineirão Complex in Belo Horizonte). Additionally, three more PPPs for sports arenas were contracted in the following years. One such case is PPP contracted in 2012 by the state of Rio Grande do Norte for the construction, maintenance, and operation management of Dunas/Novo Machadão Stadium and its parking lot in the state capital, Natal. The second is the contract signed in 2012 for the construction and maintenance of the Olympic Park in the capital of the state of Rio de Janeiro. The third contract also took place in Rio de Janeiro at the state level in 2013 for the management, operation, and maintenance of Maracanã Stadium. In fact, 2013 was the last year in which there were signings of PPPs related to this sports event.

It is noteworthy that specific large-scale events, both national and international, mobilize political actors to celebrate PPPs. This is explained, in summary, by two central factors (Reis and Cabral, 2017). The first is the country's prominent position on the international stage due to the nature of this sports event. The second refers to the significant investment that usually requires the construction or adaptation of infrastructure and, therefore, high government contributions. Thus, PPPs were an option to meet specific expectations in providing sports arenas.

As to the last years of the sample period, specifically after 2018, the surge observed in the number of contracts is due mostly to the efforts of the municipalities. In addition, in this period, the federal government strengthened its support of investment programs, for example through the investment partnerships programs, and improved regulatory policies in relevant areas such as sanitation, solid waste treatment and electricity.

### **3. The incidence of PPPs across the Grand Regions of Brazil**

Brazil is a country of continental dimensions, with a vast area of about 8.5

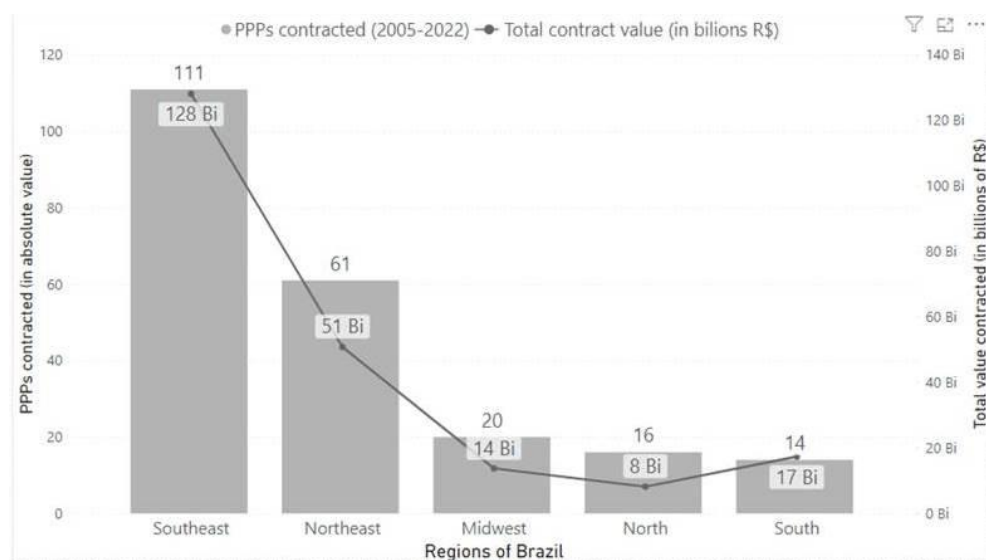


million square kilometers and a population of about 213 million people. Its territory spreads across five regions, also known as Grand Regions: North, Northeast, Midwest, South, and Southeast. This regional division brings with it significant diversity. In this section, we first present the number of contracts celebrated at all levels of government by region. Then, we consider how the adoption of PPPs in different regions may correlate with the size, the population, or the economic strength of the region.

### 3.1. The regional distribution of the PPPs

**Figure 4** summarizes information about the total number of PPPs contracted and the total value of contracts by region. The Southeast has the highest concentration of PPPs, accounting for half of the country’s contracts. Furthermore, the Southeast and Northeast regions combined represent just over three-quarters of all contracts, 77%.

As to the value of the contracts, the same regional patterns occur, albeit in a more pronounced manner. The Southwest and Northwest, with 58.7% and 23.4% of the total value of the PPP contracts, respectively, account for a combined 82.1% of the total value. Accordingly, these two regions have not only celebrated a more significant number of contracts, but the contracts they celebrated are, on average, of a higher contractual value.



**Figure 4.** Number and value of PPP contracts by region.

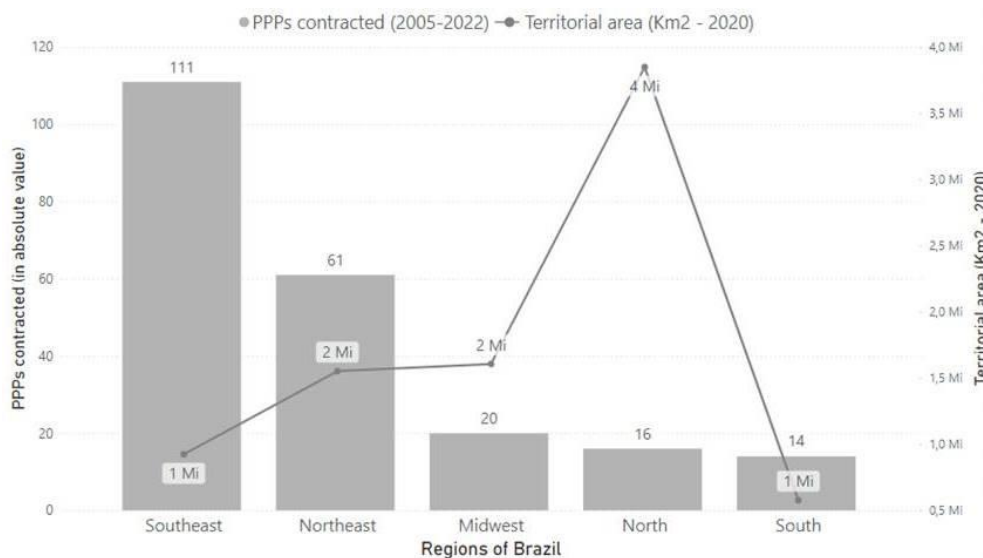
### 3.2. The incidence of PPPs and the characteristics of the Grand Regions

Several aspects differentiate the Grand Regions: non-economic indicators, such as territorial extension and population, as well as economic indicators, such as their share of the GDP. We now provide a first glimpse of how these factors may affect the regional distribution of the adoption of PPP contracts.

#### 3.2.1. PPPs by Grand Region: A territorial perspective

The share of each of the five Grand Regions of the total surface area of Brazil is as follows: North, 45%; Midwest, 19%; Northeast, 18%; Southeast, 10%; South, 8%.

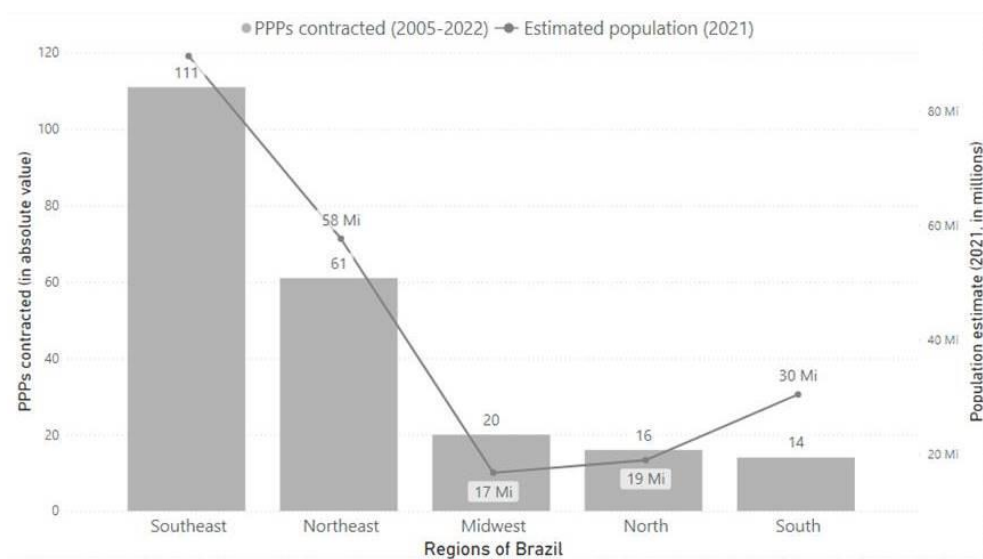
**Figure 5** considers the relation between PPP contracts celebrated in a region and its territorial surface. The Southeast, although it has a low territorial extension of just 10%, accounts for about 50% of the contracts. The Southeast and Northeast combined cover 28% of the territory and 77% of the contracts. Therefore, the territorial size of a region does not seem to have a direct influence on the number of PPP contracts celebrated.



**Figure 5.** Number of PPPs contracted by region and regional surface area.

### 3.2.2. PPPs by Grand Region: A demographic perspective

The share of the population of Brazil in each of the five Grand Regions is approximately: Southeast: 42%; Northeast: 27%; South: 15%; North: 8%; Midwest: 8%.



**Figure 6.** Number of PPPs contracted by region and regional population.

**Figure 6** considers the relation between PPP contracts in a region and its population. The Southeast region accommodates more than 42% of the Brazilian population, followed by the northeast with 27%, for a total of 69%. They account for

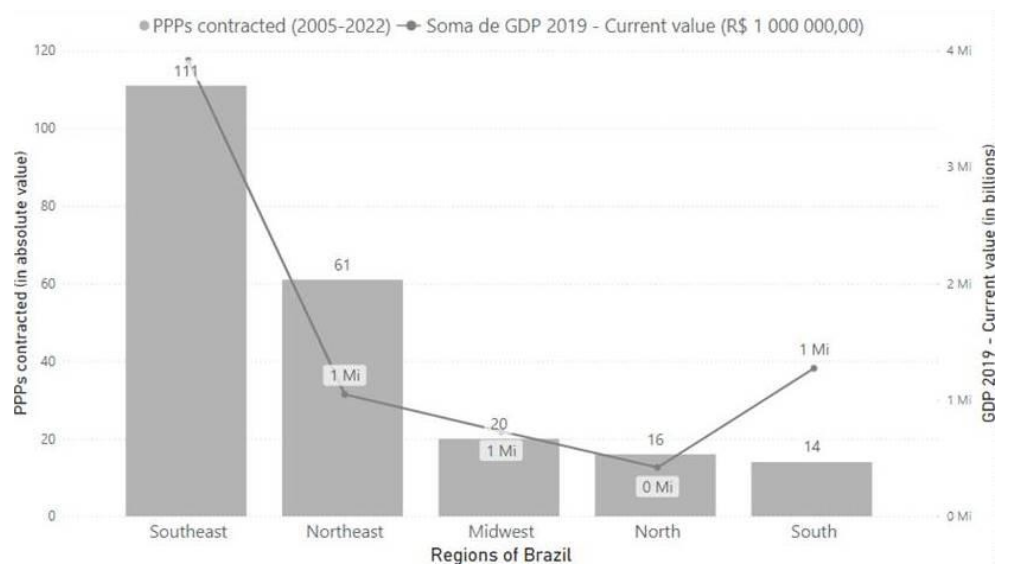
50% and 27% of the PPP contracts, or 77%. Accordingly, there seems to be an alignment between the size of the population and the number of celebrated PPP contracts.

### 3.2.3. PPPs by Grand Region: An economic perspective

The share of the GDP of Brazil in each of the five Grand Regions is as follows: Southeast, 45.7%; Northeast, 18.1%; South, 16.9%; North, 9.9%; and Midwest, 9.4%.

**Figure 7** considers the relation between PPP contracts in a region and its share of the GDP. The Southeast and Northeast regions are the most powerful in economic terms, accounting for 45.7% and 18.1% of the GDP, a combined value of 63.8%. As seen before, these two regions account for 77% of PPP contracts. As such, the economic strength of the regions seems to align with the ability to adopt PPP contracts.

It is also important to note that the Northeast has intensified the development of more inclusive policies and state intervention in public investments, which favor the provision of infrastructure and public services through PPPs. In fact, the Northeast has four times more partnerships than the South, but they do not differ much in terms of their share of the GDP.



**Figure 7.** Number of PPPs contracted by region and the regional share of the GDP.

## 4. The incidence of PPPs by levels of government in Brazil

In this section, we first present the number of contracts celebrated by level of government, specifically, at the state and Federal District on the one hand and at the municipal level on the other hand. Then, we consider how the adoption of PPPs in the different states, considering both state-level and municipal-level cases, may correlate with the size, the population, and the economic strength of the state.

### 4.1. PPPs contracted at the combined state and municipal levels

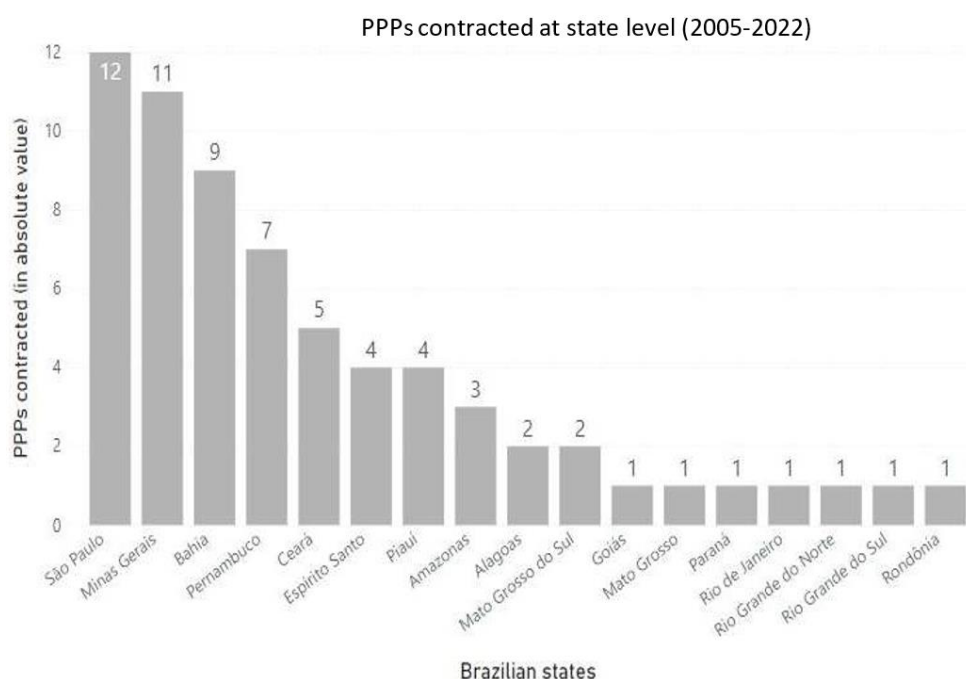
Of the twenty-six states, there are three in which no PPPs have yet been contracted at either the state or the municipal levels. They are Acre, Amapá, and Roraima. As for the 23 states where PPPs have been contracted, there are significant

differences in the number of contracts at the state and municipal executive levels. Some states, such as Alagoas, Rio Grande do Norte, and Rondônia, have contracted PPPs only at the state level. Others have contracts only at the municipal level, such as Maranhão, Pará, Paraíba, Santa Catarina, Sergipe, and Tocantins. However, the vast majority of states, the remaining 14, have entered into contracts at both executive levels.

Considering the PPPs entered into at both the state and municipal levels, São Paulo, with 25.4%, and Minas Gerais, with 15.6%, lead the ranking of contracts in Brazil, accounting for 41% of the total number of contracts. Rio de Janeiro, a distant third state with the most PPPs with 6.7% of the contracts, stands out in terms of the number of PPPs contracted at the municipal level, having only one state-level contract.

#### 4.2. PPPs contracted at the state level

The distribution of PPPs contracted by state governments is presented in **Figure 8**. In total, 17 states have contracted 66 PPPs or about 30% of all PPP contracts in Brazil. Of these contracts, more than half were celebrated in four states, São Paulo and Minas Gerais, from the southeast region with 23 or 34.8% of the contracts, and Bahia and Pernambuco, from the Northeast with 15 or 22.7%. The second is the low to moderate number of contracts in a broad set of states distributed across various regions.



**Figure 8.** Number of PPPs contracted at the state level.

#### 4.3. PPPs contracted at the municipal level

**Figure 9** shows the number of PPPs contracted at the municipal level of government, highlighting the total number of municipalities per state. This figure totals 153 PPPs contracted by municipalities in twenty states.

Several states have a high number of municipalities and a low number of contracts. This is the case of the state of Minas Gerais, which leads in the total number of municipalities in the country but has about half the contracts of São Paulo. Rio Grande do Sul, the third state in terms of the number of municipalities in the country, has only three contracted partnerships. Another example is Rio de Janeiro, which has a low number of municipalities (the eighteenth in the country) and holds the third position in terms of the number of municipal PPP contracts. This suggests that the decision to enter into PPPs does not depend on the number of municipalities in a given region.

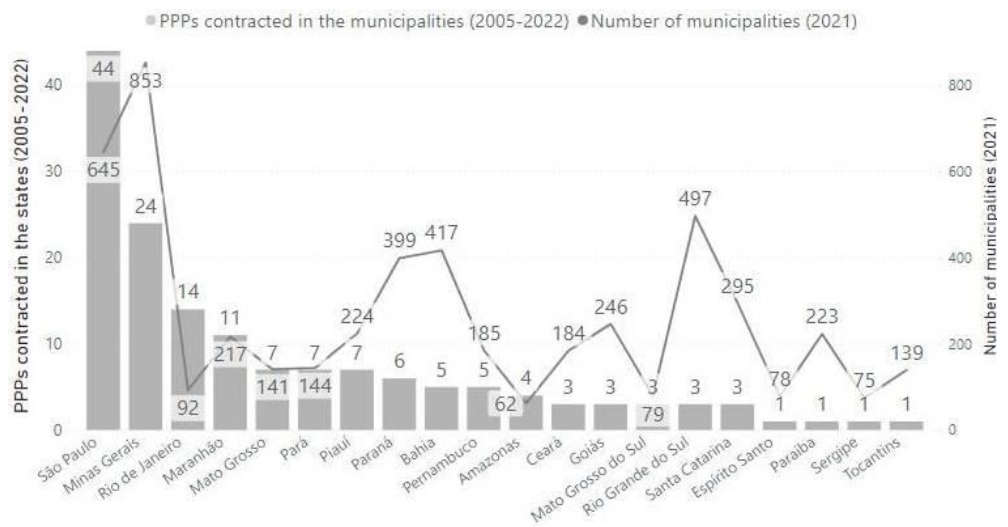


Figure 9. Number of PPPs contracted at the municipal level.

Although local governments show a high number of contracted PPPs in the country, it is important to note that few municipalities, only 127 of 5568 municipalities, or just 2.4%, have contracts in place. Furthermore, of the total number of municipalities that have contracted these partnerships, only 16, a tiny minority of just 0.2%, have made more than one contract in the period under analysis.

Another important point at the municipal level concerns the number of capital cities with contracted PPPs. Out of twenty-six capital cities in the country, eleven have entered into 27 PPPs, i.e., they account for 17.6% of the total partnerships at the municipal level. The capital cities that have contracted the most PPPs are located in the Southeast, namely Belo Horizonte, São Paulo, and Rio de Janeiro.

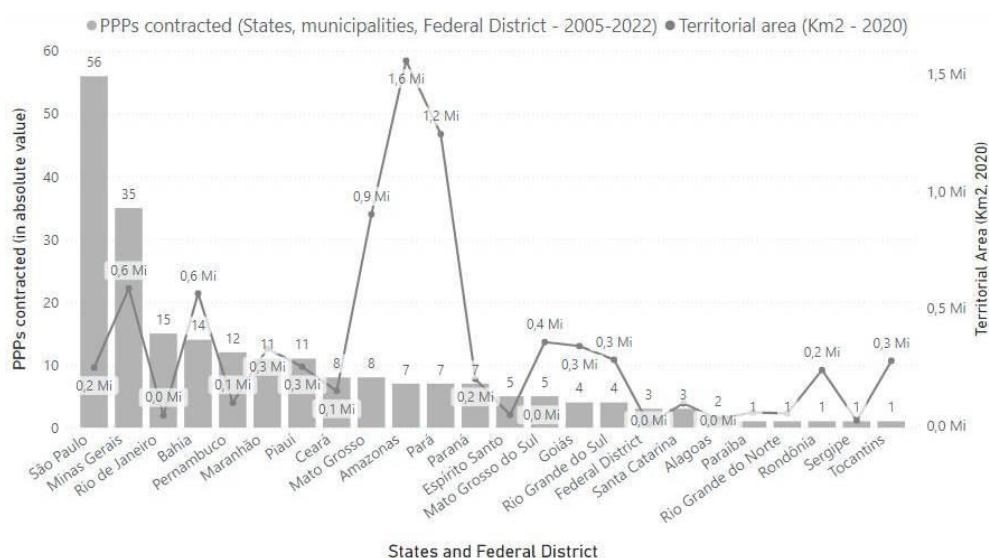
#### 4.4. The characterization of the PPPs at the state, district, and municipal levels

We now take a detailed look at the number of contracts celebrated in each state by the municipalities and the states themselves. We then consider the potential relationship between these indicators and different territorial, demographic, and economic characteristics across states. Given the small number of contracts celebrated at the municipal level relative to the large number of municipalities, we have opted to consider only the combined number of contracts signed at the state and municipal levels in this analysis.

#### 4.4.1. PPPs at the state, district, and municipal levels: A territorial perspective

The surface area of each state in Brazil as a share of the total surface of the country is as follows: Amazonas: 14%; Pará: 12%; Mato Grosso: 10%; Minas Gerais: 10%; Bahia: 6%; Mato Grosso do Sul: 4%; Goiás: 4%; Maranhão: 4%; Rio Grande do Sul: 3%; Tocantins: 3%; Piauí: 3%; São Paulo: 3%; the remaining 15 states: 24%.

**Figure 10** relates the number of PPPs contracted at the state, district, and municipal levels with the territorial area of the state. The contrast between the territorial dimension and the total number of contracted partnerships is noticeable. The state of São Paulo, leading in contracting at the state and municipal executive levels, has a smaller territorial area compared to the second state in this ranking of contracts, Minas Gerais. Overall, this information suggests that, as already observed at the regional level, the adoption of PPPs seems to be unrelated to the size of the jurisdiction where they occur.



**Figure 10.** Number of PPPs at state, district, and municipal levels: A territorial perspective.

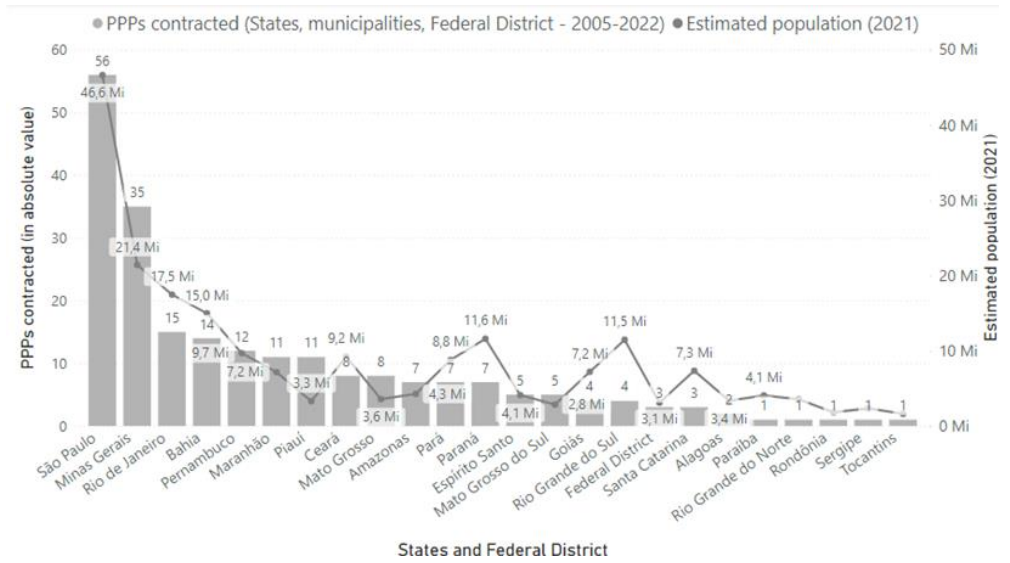
#### 4.4.2. PPPs at the state, district, and municipal levels: A demographic perspective

The population for each state in Brazil as a share of the total population of the country is as follows: São Paulo: 21%; Minas Gerais: 10%; Rio de Janeiro: 8%; Bahia: 7%; Paraná: 6%; Rio Grande do Sul: 6%; Pernambuco: 4%; Ceará: 4%; Pará: 4%; Santa Catarina: 3%; Maranhão: 3%; Goiás: 3%; Federal District: 3%; the remaining 14 states: 20%.

**Figure 11** relates the number of PPPs contracted at the state, district, and municipal levels with the population of the state where they are located. Overall, the data suggests a relationship between the size of the population and the number of contracted PPPs.

It is noticeable that the four states with the largest number of contracts, São Paulo, Minas Gerais, Rio de Janeiro, and Bahia, which account for 53.8% of the contracts, also concentrate the four largest shares of the population, accounting for 46% of the total population.



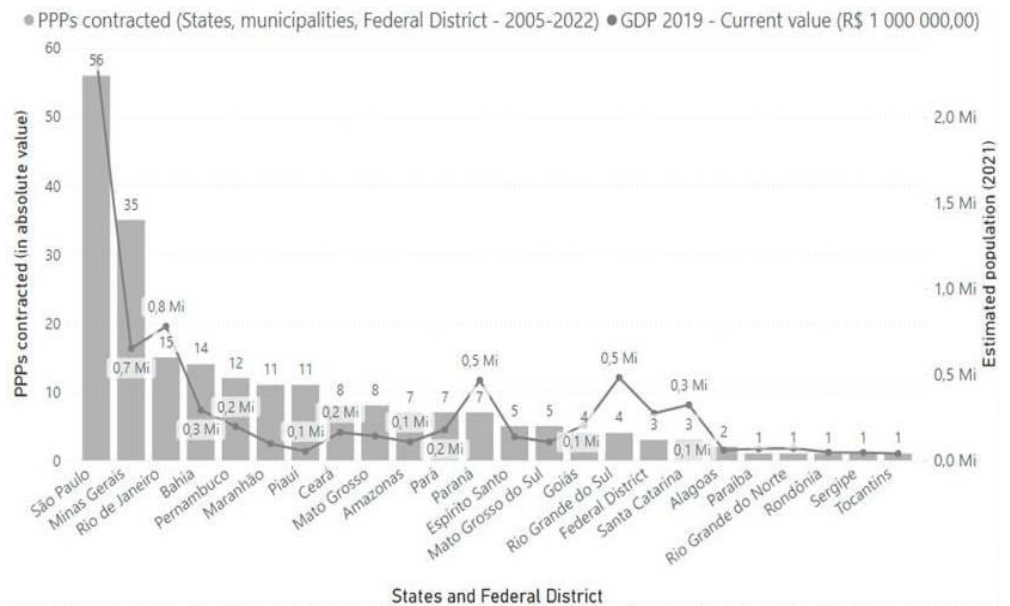


**Figure 11.** Number of PPPs at the state, district, and municipal levels: A demographic perspective.

For the remaining 20 states that showcase PPP contracts, the total number of contracts is much smaller than that of the first group. Moreover, within this group, there are some states with few partnerships but a high concentration of population, such as in the case of states in the South, Paraná, Santa Catarina, and Rio Grande do Sul, and in the Northeast, Ceará.

**4.4.3. PPPs at the state, district, and municipal levels: An economic perspective**

The share of the country’s GDP for each state in Brazil is as follows: São Paulo: 33%; Rio de Janeiro: 11%; Minas Gerais: 9%; Rio Grande do Sul: 6%; Paraná: 6%; Bahia: 4%; Santa Catarina: 4%; Ceará: 4%; Goiás: 3%; Pernambuco: 3%; Federal District: 3%; the remaining 16 states: 15%.



**Figure 12.** Number of PPPs at the state, district, and municipal levels: An economic perspective.

**Figure 12** relates the number of PPPs contracted at the state, district, and municipal levels with the state share of the GDP. Overall, the economic profile seems to be disconnected from the contracting of PPPs, except in the case of the state of São Paulo and other large states.

In this figure, the state of São Paulo contrasts with other states in two aspects. First, it stands out for its concentration of PPPs, which is significantly higher compared to any other state. Second, it has a high economic profile characterized by the highest GDP among all Brazilian states. It's worth noting that this state has a strong capacity for public investment spending, in which PPPs are integrated (CBIC, 2015, pp. 81–86). Additionally, the state of São Paulo is a pioneer in the use of these partnerships in the country, alongside Minas Gerais, which enhances greater technical knowledge and institutional and technical capacity to develop PPP projects compared to other states.

Although ranking second in contracts, the state of Minas Gerais does not show a significant difference in the 2019 GDP compared to Rio de Janeiro. However, it has more than double the number of contracts.

Another noteworthy situation is the case of the Northeastern states, particularly Bahia, Pernambuco, and Ceará. These represent states with high economic capacity in the region and have been mobilizing in the use of PPPs. However, other states in this region have lower GDPs and high numbers of PPPs, e.g., Maranhão and Piauí. The case of Santa Catarina in the South also stands out, with a low number of contracts and a relatively high GDP.

## **5. Characterization of contracted PPPs: Areas of intervention**

In this section, we focus on the areas of intervention of the PPPs and how they vary at the state and municipal levels. The Brazilian federal system assigns a significant portion of governmental competencies to the state and municipal jurisdictions (Moraes and Reyes-Tagle, 2017). Matters of national interest are incumbent upon the Union, while states deal with matters of regional interest and municipalities with matters of local interest (Silva, 2015). This division of competence explains why certain areas of infrastructure investments tend to fall under the responsibility of the states and others under municipal jurisdiction.

### **5.1. Areas of intervention for all PPPs**

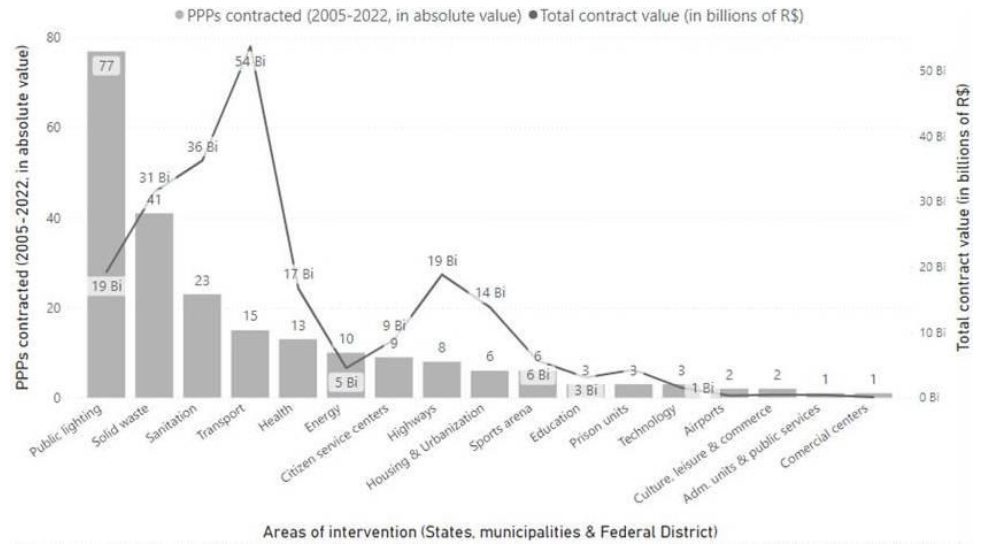
**Figure 13** presents the number and the value of the contracts by area of the intervention, combining contracts celebrated at all levels of government.

In total, PPPs in Brazil have been celebrated in seventeen areas of intervention. The areas with the greatest incidence of PPP contracts are public lighting, solid waste, and sanitation, which account for about 63% of the total number of PPP contracts but only 39.5% of the total contracted value. This difference is due to the very low average value of public lighting PPP contracts.

PPPs celebrated in the area of transportation, including urban mobility, such as the metro, as well as complementary infrastructures, such as bus terminals, are of particular interest given their exceptionally high average individual value. These contracts have the largest PPP contracted value of all areas of intervention,



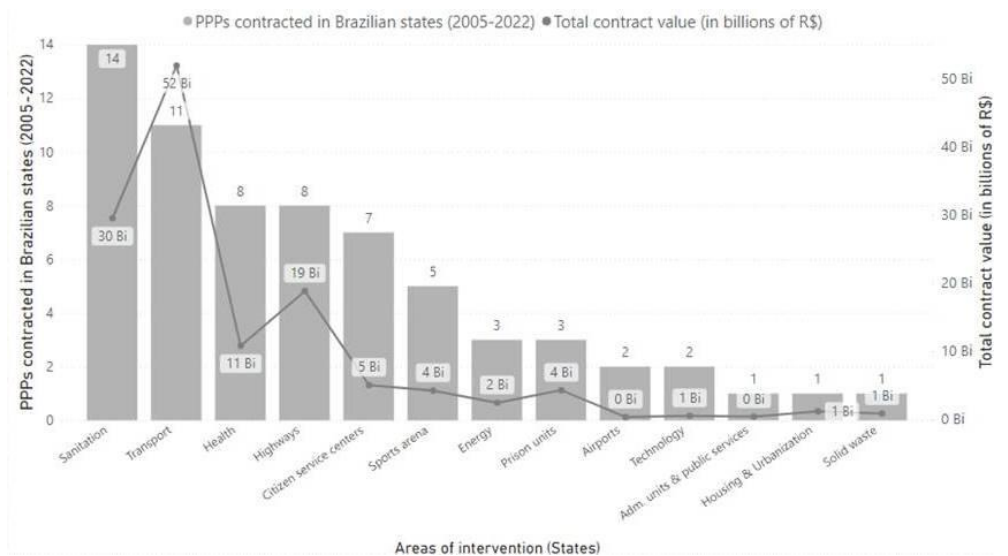
accounting for about 25% of the total contract value in the country. Yet, they represent only 6.7% of the number of contracts. Other areas of intervention that present high values and a reduced number of PPPs include highways as well as housing and urbanization.



**Figure 13.** Areas of intervention: number and value of PPP contracts.

## 5.2. Areas of intervention for state-level PPPs

**Figure 14** presents the number and the value of the PPP contracts celebrated at the state level by the area of the intervention. It considers the 13 areas of intervention contemplated in such PPP contracts.



**Figure 14.** Areas of intervention at state level: number and value of PPP contracts.

Sanitation is the area of intervention with the greatest number of contracts. However, transport, health, highways, and citizen service centers also have significant numbers. These five areas comprise about 72% of the number of PPP contracts celebrated at the state level. The area of transportation, however, has the largest share of the state-level contracted values, about 40%. The five areas

mentioned above altogether also have the lion’s share of the value of the contracts, 88.6%.

### 5.3. Areas of intervention for municipal-level PPPs

Figure 15 presents the number and the value of the PPP contracts celebrated at the municipal level by the area of the intervention.

At the level of the municipalities, public lighting and solid waste are by far the most important areas of intervention, with 74% of the number of contracts and 57.3% of the value of the contracts. It should also be noted that the housing and urbanization sector presents a very high total contract value. It is worth noting that among the four contracts celebrated, one stands out in the financial dimension: the concession for the provision of services/works aimed at the revitalization, operation, and maintenance of the Special Urban Interest Area—AEIU of the Port Region of Rio de Janeiro.

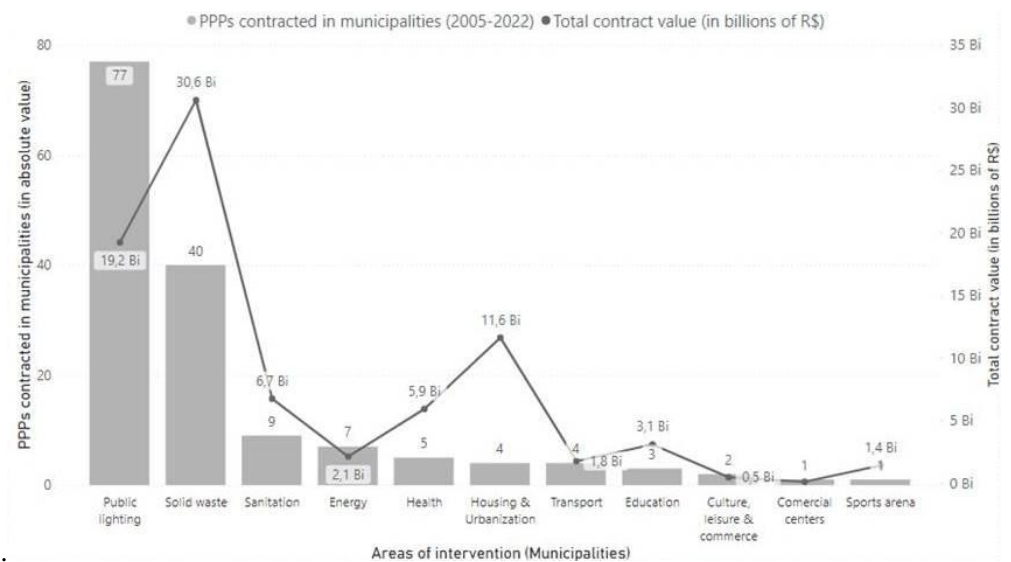


Figure 15. Areas of intervention at municipal level: number and value of PPP contracts.

## 6. Concluding remarks

The objective of this study is to describe the universe of the PPPs in Brazil with a particular focus on the regional incidence of adoptions and the jurisdictional levels of government behind such adoptions. This endeavor was made possible by the development of a new database of infrastructure investments under PPP contracts in Brazil between their inception in 2005 and 2022.

### 6.1. The main stylized facts of PPP infrastructure investment in Brazil

The main stylized facts of PPP infrastructure investment in Brazil can be summarized as follows. First, 223 PPP contracts with a combined value of R\$219 billion have been adopted in Brazil across different areas of intervention, regional locations, and government jurisdictions. The overwhelming majority of PPP contracts are long-term in nature, usually exceeding twenty years, and of the

administrative type in which contractual costs are to be primarily supported by the public sector without necessarily involving the collection of fees from users. The long-term impact on the public contracting entities is, therefore, significant.

Second, most of the PPP contracts have been celebrated at the municipal level, 68.4%, with public lighting and solid waste as the dominant areas of intervention, with 72% of the municipal-level PPPs. At the state level, sanitation, transport, health, highways, and citizen service centers are the most important areas of intervention, accounting for 74% of the PPP contracts.

Third, the Southeast and Northeast regions of the country have a high concentration of PPP contracts. At the same time, the Midwest, North, and South considerably lag behind both in the number of contracts and the value of the contracts. When decomposing PPPs by state, it becomes clear that a significant part of the PPPs is located in four states: São Paulo, Minas Gerais, and Rio de Janeiro in the Southeast region, and Bahia in the Northeast region.

In this context, it should be noted that migration from the countryside to large urban centers changed the level of urban density in some regions of the country, particularly the Southeast region (Silva, 2015). This accelerated urban population growth resulted in increased demand for infrastructure and public services. It is also important to note that the Northeast has intensified the development of more inclusive policies and state intervention in public investments, which favor the provision of infrastructure and public services through PPPs (Economistas, 2018).

The Brazilian context is quite complex, mainly due, first, to significant social and economic regional disparities and, second, to multi-layer levels of government existing under its federative umbrella (ABIIB, 2019; CBIC, 2015; Economistas, 2018). As such, it's important to get a sense of the possible connections between the adoption of PPPs and the characteristics of the different regions. This leads to the next two stylized facts.

Fourth, adoption of PPPs tends to concentrate in regions with large populations and, therefore, high demands for infrastructure and public services. This is often assumed in literature without empirical support (ABIIB, 2019; Economistas, 2018). Our data provides evidence that such is the case in Brazil, as this pattern is apparent both at the regional level and at the levels of the states and the Federal District.

Fifth, at the regional level the economic strength of the regions seems, to align with their ability to adopt PPP contracts. At the state level, however, the economic profile appears to be disconnected from the contracting of PPPs, except in the case of the state of São Paulo and a few couple of other large states. As such, our evidence provides only partial vindication of the literature that postulates that the economic strength of a region is among the main explanatory factors of the results of public policies (Thomson et al., 2017).

## **6.2. Limitations and potential avenues for future research**

Despite the relevance of establishing these important stylized facts for PPP infrastructure investments in Brazil, this study is necessarily limited. This is because it is designed to present basic, yet until known unknown, information about this

universe, and to relate it to the views expressed in the literature, without necessarily attempting to explain such patterns.

This limitation, however, can also be perceived as part of the contribution of this paper. Indeed, we see the presentation of this stylized evidence and the very existence of the new data set supporting it, as making possible the investigation of the different factors determining or conditioning the adoption of PPPs.

In a way, this paper opens the door for a wide and consequential research agenda. There are different arguments for governments to resort to PPPs. Overall, the goal is to make available infrastructure and public services at the lowest possible cost and to raise their level of quality and efficiency compared to other types of public procurement (Boardman and Hellowell, 2016; Hodge and Greve, 2019; Torfing et al., 2012; Verweij et al., 2022). Although arguments of government benevolence prevail in defense of the use of PPPs, there is also an extensive political debate surrounding their use (Flinders, 2005; Hellowell, 2010; Hodge et al., 2018; Sarmiento and Renneboog, 2021). Yet very few empirical studies have addressed the political dimension of the adoption of PPPs in general and even less so in Brazil.

In this context, it is worth emphasizing that ideological party differences have often been used as an essential variable to explain public policy choices in general and, particularly, in the Brazilian case (Medeiros, 2018; Tarouco and Madeira, 2013). Traditionally, right-wing parties are assumed to support free market policies to address socio-economic problems and advocate for minimal state intervention (Harvey, 2005; Lipset, 2007). Thus, a legitimate question is whether or not right-wing parties leading the Brazilian executives are more likely to initiate procedures and adopt PPP contracts compared to left-wing parties.

Another potential political factor in the adoption of PPPs is the flow of the electoral cycle. Theoretical arguments substantiated by multiple empirical studies suggest that political actors tend to define and adopt public policies based on opportunism or political strategy related to the electoral calendar (Brender and Drazen, 2005; F. J. Veiga et al., 2017; L. G. Veiga et al., 2018; Sakurai, 2009). Different moments of the mandate seem to be associated with the realization of specific procedures for PPP contracting (Firmino, 2010). The pre-electoral and electoral years appear to be associated with the execution of procedures related to earlier phases of contracting, corresponding to the last two years of the mandate. This is expected because executives want to convey the message of work done and, thus, maximize their competence in the eyes of the voters (Maskin and Tirole, 2008; Sarmiento and Renneboog, 2021).

Finally, and ultimately, it would be important to determine the extent to which the infrastructure investment gap and the financial constraints faced by the different government jurisdictions have played an important role in the adoption of PPPs in Brazil. In fact, this occurred in other countries that have significantly adopted PPPs in public provision, such as European countries—the United Kingdom and Portugal (EPEC, 2015, Mizell, 2018, Torfing et al., 2012; Verweij, 2022; Winch et al., 2012).

### **6.3. The broad appeal of the Brazilian case**

To conclude let's ascertain the fact that Brazil presents a particularly interesting

case in terms of PPP adoptions. Brazil has seen a significant growth in the number of PPPs in recent years, which is a phenomenon to be explained in and of itself but which, from our perspective, translates into a large sample of data for empirical analysis. Furthermore, the data covers a wide spread of situations that enrich the analysis. Brazil is characterized by multilevel government, with local, regional, state, and federal levels of government led by political parties with varied ideological persuasions and subject to a rather varied electoral calendar. The specificities of the Brazilian political system and the decentralized political decision-making for PPPs provide room for a structural comparison between cases analyzed with and without the celebration of these partnerships.

The Brazilian case is also not parochial but rather quite central, particularly in relation to Latin America and the Caribbean. Brazil has the largest PPP market share in this area, followed by Chile, Colombia, Peru and Mexico (Carvalho and Reyes-Tagle, 2022). Furthermore, in the last decade, Brazil and several other countries in the region, namely Chile, Colombia, Costa Rica, Panama, Peru, and Uruguay, have led the *Infrascopes 2021/2022* under the auspices of the Inter-American Development Bank. This framework, in which Brazil and Chile play a pivotal role, assesses the countries' ability to mobilize infrastructure investment through PPPs.

In this context, the Brazilian experience in developing, implementing and regulating PPP frameworks provides a model for other regional countries with similar infrastructure needs and fiscal constraints. The broad sectoral scope of the experience, including transportation, energy, and sanitation, and the multilayered regional decision process only add to the appeal of the Brazilian case.

Ultimately, PPPs are essential in Brazil for addressing infrastructure gaps, fostering economic growth, and managing fiscal constraints. At the same time the Brazilian experience offers valuable lessons and models for other countries looking to leverage PPPs to meet their development goals, improve public services, and enhance economic stability.

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