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Collusion in Public Procurement and Bureaucratic Corruption

Uncertainties, Transaction Costs, and Institutional Change

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Abstract

Collusion and corruption are both unfair and harmful to development. Just as lawful economic exchanges, they entail transaction costs. The present case study employs the New Institutional Economics theory to investigate the microeconomic elements of the "Car Wash" scandal in Brazil, which revealed, *inter alia*, systemic collusion among public-procurement bidders, as well as bureaucratic corruption. Transaction costs make economic exchanges imperfect and less efficient. Reformers should adjust government institutions to both reduce certain transaction costs in legal dealings and increase them in illegal dealings. The Car Wash case can be understood as a failure of Brazilian government institutions on both fronts. Among other sources, the present study widely employs court depositions provided by economic agents, both from the private sector and from the public administration, who directly participated in the transactions. They illegally exploited institutional failures for personal benefit. Later, they entered into cooperation agreements with law-enforcement authorities and provided detailed accounts of how the deals functioned. Despite considering different parties' perspectives in illegal deals, the present study focuses on the private sector point of view. Secondarily, it exploits the interplay between collusion and corruption and their mutuality: collusion and corruption also operate to reduce each other´s transaction costs. In light of the study's findings, a number of reform measures are suggested.

Key Words: Brazil, bribery, bureaucratic corruption, Car Wash, collusion, corruption, Lava Jato, Petrobrás, public procurement, transaction costs, uncertainties

1. Introduction

Often, measures planned to combat wrongdoing, such as public procurement collusion and corruption, focus on law enforcement: expanding police and judiciary capabilities, streamlining criminal procedural law, increasing penalty size, and so on. In Brazil, between 2014 and 2016, two million citizens subscribed to a reform proposal initiated by public prosecutors, which became known as “10 Measures Against Corruption” (Ministério Público Federal, 2016). Unsurprisingly, nine of the ten measures are concerned with law enforcement. The supporters of this type of reform correctly presumed that increasing the cost of crime – i.e., the increase of the probability of being detected and punished combined with the increase of the penalty size – is critical in combating wrongdoing (Michele, 2016). Although the ends of such an approach are appropriate, the means are not enough to make the cost–benefit ratio of illegal activities less attractive than the one of legal activities.

Preventive measures should be considered, both to decrease the attractiveness of illicit options and to increase the attractiveness of licit ones. Employing the New Institutional Economics framework makes it possible to develop preventive initiatives by focusing on uncertainties in general and transaction costs in particular. Institutional changes that aim to decrease certain transaction costs for legal exchanges and to increase the transaction costs for illegal exchanges can affect economic agents’ cost–benefit analyses, thereby helping guide them away from wrongdoing. Transaction costs are concerned with access to information, negotiating and enforcing deals.

The present case study investigates the collusion scheme involving public works firms and the bureaucratic corruption surrounding the procurement processes of Petrobrás, the Brazilian state-owned oil giant, from 2004 to 2014. The study compared the arrangements of transactions by the same economic agents both in a hypothetical legal institutional framework and in an actual illegal one, as well as their respective transaction costs.

That is a case of systemic corruption, partially due to the failure of Brazilian government institutions. They failed in many respects, two are particularly notable.

First, they were unsuccessful in reducing particular uncertainties – and their respective transaction costs – of legal institutional framework, namely the rules of the procurement processes and the rules of execution of public works contracts, mainly due to (i) lack of institutional trust; (ii) difficulties determining cost, duration, and technical aspects of infrastructure projects; (iii) excessive bureaucracy in Petrobrás; and (iv) the legal proceedings necessary to protect transacting parties´ rights. Such a failure helped foster collusion and corruption in government procurement.

Second, government institutions failed to prevent the arrangement of illegal institutional framework. Parties were free to reduce several uncertainties that are typical of collusive and corrupt dealings, and to profit from such dealings. Such transaction costs were associated with the problematic enforcement of illegal deals, the risks of transferring dirty money, etc. Government institutions failed to such an extent that the illicit scheme became systemic and lasted for about ten years. Furthermore, it can be concluded that collusion and corruption were reciprocally useful in the mitigation of many respective uncertainties.

Analyzing a real-life case, where lawful and unlawful institutional frameworks are considered side by side, should assist policymakers to locate the costs affecting economic transactions in both frameworks, and then to make appropriate institutional adjustments.

Authors such as Husted (1994), della Porta and Vannucci (1999, 2012), and Lambsdorff (2007) have applied the New Institutional Economics theory to better understand corruption. In particular, Lambsdorff (2002) has applied transaction costs approach to corruption. To the best of the knowledge of the author hereof, however, the application of transaction costs approach to a case study of collusion and corruption has not yet been developed.

In economics, analytical narratives are not the norm, as they would not be generalizable to other cases (Alston, 2008, p.103). However, they represent an opportunity to apply theoretical models to specific, real-life events and, therefore, to test their applicability. The case under analysis is a scenario where economic

actors opportunistically replaced failed legal institutions with illegal institutions over time. Such legal institutions deserve correction from policymakers. Moreover, the illegal institutions then created were not immune to certain transaction costs. Likewise, reformers should act to increase these costs. Case studies can provide useful insights into reforms when dealing with similar cases; they also provide an opportunity to compare the evolution of institutions, from legal to illegal ones, over time. Such application of case studies is endorsed by Alston (2008, p.115):

> Temporal analysis of the determinants and impact of institutions is necessary in order to understand the dynamics of institutional change better. Case studies are ideal for this task because they enable the analyst to construct an analytical narrative. Narratives allow the combination of a deeper understanding of the historical and institutional context with a theoretical framework. Temporal narratives also allow the scholar the ability to address the "big picture," that is, both the consequences of institutions on economic performance and the feedback of economic performance on institutional change.

Most research into corruption tends to adopt the standpoint of bribe receiver (public official). While not disregarding this perspective, the present study tends to prefer the bribe payer´s (private sector) perspective,[1] for two reasons. First, the author has more than 15 years' experience of working for private corporations in Brazil's infrastructure sector, including one involved in the case under analysis. Although not party to any confidential information, and therefore not using any, the author believes that such corporate positions have enabled a better understanding of corporations' internal dynamics and their decision-making processes, which are aspects often disregarded by academic research in the field of anti-corruption. Second, while the private corporations participated simultaneously in both collusive dealings and corrupt dealings, public officials did not partake in the former. Therefore, as the present case concerns both offences, intimately interlinked, the private sector perspective is more appropriate.

Research about interconnections between corruption and collusion were carried out by Lambert-Mogiliansky (Lambert-Mogiliansky & Sonin 2005; 2011), Wells

(2014), and by international organizations, such as the Organisation for Economic Co-operation and Development (OECD, 2010a). Several cases where corruption took place in combination with procurement collusion are known about worldwide. The majority come from the developed world, and while several of these will be indicated herein (Chapter 5), exploring a case from a developing country, such as Brazil, may add valuable input to studies about such combination of offenses. Moreover, the case in question relates to offenses perpetrated in only one of the Brazilian state-owned companies. Evidences indicate that similar ruses may have also contaminated procurement processes in other state-owned enterprises (SOEs) (Casado, 2015).

Finally, the raw material analyzed for the case study was originally produced in Portuguese. This academic work has been originally produced in English, which should increase the visibility of this information to a wider group of academics and reformers.

The raw data used to build up the case were extracted from the depositions made by individuals who directly partook in the wrongdoings. They were detected and eventually entered into cooperation agreements with Brazilian law-enforcement authorities. This provides a rare opportunity for researchers to access first-hand information about collusion and corruption, thereby allowing analysts to uncover details from a real-life case. Although investigations are still ongoing, as of October 2016, the central underpinning institutions of the scheme are already relatively clear.

The present master thesis is divided into seven main sections. The following section presents the theoretical perspective adopted (Section 2). Subsequently, Section 3 indicates the methodology and the methods employed in developing the case study. Section 4 includes the analytical narrative and its links with the transaction costs theory. This section is subdivided into three subsections. The first subsection analyses transaction costs of the legal dealings and how collusion and corruption were deemed satisfactory responses to them (Subsection 4.1). The second subsection contains an analysis of some of the specific transaction costs of collusion and corruption and how the parties employed further institutional

changes as a reaction to them. Moreover, this subsection explores the complementarities of collusion and corruption and the use of intermediaries (Subsection 4.2). The third subsection considers the consequences of collusion and corruption in general, and the consequences of Brazil's Car Wash case, in particular (Subsection 4.3). Section 5 indicates a collection of cases that are similar to that studied here, and Section 6 contains policy recommendations. Final conclusions are drawn in Section 7.

2. Literature review

2.1. Introduction to transaction costs

Uncertainty is a ubiquitous feature of human exchanges. Incompleteness of knowledge affects the behaviour of economic agents, as they cannot fully evaluate either the benefits or the costs of an economic exchange. There are several different conceptions of uncertainty (Dequech, 2006). However, for the purposes of this study, uncertainty is considered in its broader meaning: the shortage of all the information necessary to make decisions to obtain certain outcomes (Dosi & Egidi 1991, p.145). Not only is information frequently lacking, but it is also costly to acquire (North, 1992, p.7), assuming it is even attainable; the acquisition of knowledge that will better guide actors' decision-making processes requires time, money, and often considerable stress.

An additional aspect of information assessment augments uncertainty: the role of actors´ limited cognitive capacity and belief-based biases that affect their evaluation of a transaction's various dimensions (North, 1981; Greif, 2008). In contrast with "substantial uncertainty," that is, the simple lack of information mentioned above, Douglass North (1981), a pioneer of the New Institutional Economics (NIE), introduced the concept of "procedural uncertainty." Procedural uncertainty arises from the "limitations on the computational and cognitive capabilities of the agents to pursue their objectives unambiguously, given the available information" (Dosi & Egidi 1991, p.145). Overcoming such imperfect capabilities adds costs to the transaction, which mainly translate into time and money. Therefore, uncertainties are not only ubiquitous because information is often deficient, but also because economic actors' perceptions and attitudes toward reality can lead them to make biased decisions (North, 1992, p.8). The reality of a transaction is a jigsaw puzzle with missing pieces, which is seen from the subjective perspectives of the parties involved.

The costs linked to overcoming the two abovementioned limitations are instances of transaction costs. The concept of transaction costs was initially presented by Coase (1937) and was widely employed and developed by NIE followers.

Converse to production costs, transaction costs are involved in shaping an economic transaction, that is: (i) the precarious effort to determine the right conditions for the transaction and (ii) the costs involved in securing its perfect completion. Likewise, Barzel (1997, p.5) explains that “(t)he transfer of assets entails costs resulting from both parties’ attempts to determine what the valued attributes of these assets are and from attempts by each to capture those attributes that, because of the prohibitive costs, remain poorly delineated.”

Uncertainties about the future are the essence of long-lasting relational exchanges; thus, the ever-present transaction costs are of particular concern. This approach is especially useful for long-lasting exchanges, because foresight of all contingencies is impossible, which compels the parties to seek mechanisms to more accurately determine the costs and benefits of a transaction. Attaining and processing information are costly processes because: (i) "not all future contingencies for which adaptations are required can be anticipated at the outset" (Williamson 1979, p.237) and (ii) “the appropriate adaptations will not be evident for many contingencies until the circumstances materialize” (Williamson). However, even in the face of such limitations, agents employ efforts to adapt as far as possible. Agents always seek to maximize through partial knowledge and subjective decision-making processes (Furubotn & Richter, pp.3–4). Such adaptation mechanisms sometimes go as far as circumventing legal rules to mitigate for any arising contingencies. Therefore, to conclude a given deal, the parties seek alternative protection measures (sometimes illegal ones) to mitigate uncertainties and the costs connected to them.

Ultimately, the objective of economic exchange is wealth maximization, which mainly entails increasing benefits and reducing costs, including transaction costs. In such attempts, polities, individuals, and organizations develop and adapt rules to provide structure to human interaction. An economic transaction can be affected and guided by multiple behavioural rules that include, *inter alia*, the laws of a particular jurisdiction, social norms, and self-imposed codes of conduct. These rules are called institutions (North, 1992, p.9).

2.2. Institutions

Institutions and their enforcement mechanisms, both in legal and in illegal exchanges, provide structure to human behaviour. They consist of either formal (statutory laws, contracts, etc.) or informal (social norms, customs, self-imposed codes of conduct, etc.) rules (North, 1992, p.9; della Porta & Vannucci, 2012, p.34; Aoki, 2001, p.5). Institutions are “the rules of the game” (North, p.10) that are meant to reduce the contracting uncertainties, which would otherwise overcome cognitive capacity in complex exchanges (Greif, 2008).

However, in a given environment, institutions may not respond satisfactorily to the maximization purposes of the players, either because the institutions are objectively not conducive to gain boosting or because they are perceived as such. The parties are then incentivized to search for more profitable institutional alternatives (North, 1992, p.11), whether legitimate or not. Institutions are themselves a product of human activity toward the active reduction of uncertainties and the consequent maximization of benefits (Lambsdorff, 2007; della Porta & Vannucci, 2012). The actors are not passive before a governance framework; rather, they both create and alter the rules of the game to eventually increase their rewards.

For example, a written contract signed by a private firm and a public organization regarding the execution of a certain scope of work contains several formal legal institutions. If such an agreement does not provide adequate enforcement rules for the firm (i.e., the protection of its rights is deemed uncertain), then the firm at risk may seek the development of an institutional adaptation to mitigate said enforcement-related transaction costs. The adaptation can be an agreement to pay a bribe – which contains illegal informal institutions, with the aim of ensuring cooperation by officials within the public organization – to protect the firm´s rights.

NIE traditions acknowledge the existence of incentives, opportunities, and constraints created by institutions, and strongly emphasize the critical role of imperfect institutions, mainly where transaction costs are significant (North, 1992). Instances of opportunities and incentives for misconduct, such as corruption, are

the magnitude of rents that can be collected by corrupt parties, and the type of bureaucracy and procedures in which transactions develop (della Porta & Vannucci, 2012, p.13). For instance, public tenders for large infrastructure projects can generate high rents to a competing firm if engaged to execute said projects. Such attractive rents can operate as an incentive to corruption. Moreover, if the selection of public officials depends on a political appointment, then a private firm connected with those who appoint officials has occasion to unlawfully affect the appointments. Connections between businesses, politicians, and bureaucrats provide an opportunity for corruption. The aforementioned are instances of opportunities and incentives generated by institutions that can be exploited to maximize transacting parties' benefits. Corrupt institutions, as well as collusive ones, are types of institutional alternates.

The neoinstitutionalist approach to comparing licit and illicit exchanges enables analysis of how individuals and organizations assess the reality of governance frameworks and how they either conform to them or create alternates, with the ultimate aim of wealth maximization.

2.3. Transaction costs of collusion and corruption

Prior to analyzing the specific transaction costs of corruption and collusion, both terms have to be defined for the sake of clarity. Collusion is a secret, horizontal arrangement among bidders to defraud one or more competitive procurement processes. Collusion mainly aims at reducing competition, and can display different forms or a combination thereof. Price fixing, market sharing, bid rotation, and cover pricing are the most usual collusion mechanisms (OECD, 2010a). Price fixing takes place when the firms involved agree on the contract price that will win a certain tender. Such a mechanism is especially efficient where the contract is awarded on a lowest-price basis. Market sharing and bid rotation are arrangements between bidders to take turns winning bids (OECD), mainly where several projects are foreseen, and bidders share the market to allow all competitors access to projects. Finally, cover pricing is the strategy of presenting mock proposals designed for rejection by the buyer, allowing the designated winner to be selected in an apparently legitimate bid. The association of

companies colluding to accomplish such aims is known as a cartel (Transparency International, 2009a).

Corruption has a more controversial definition, however. Broadly, it can be defined as "the abuse of power for personal gains" (Transparency International, 2009, p.14). Narrower definitions tend to centre attention on the demand side of corruption and on the participation of public officials, such as the classic definition formulated by Nye (1967, p.419), where corruption is “the behaviour which deviates from the formal duties of a public role because of private-regarding (…) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding influence." Narrower definitions are inclined to disregard the perspective of the supply side of corruption and the possibility of private–private corruption.

As the focus is typically placed on the state-demand side of corruption, a distinction between political corruption and bureaucratic corruption is necessary for analytical purposes. The borderline between the two is not clear-cut, however, as the separation of politics and bureaucracy is imprecise in most political systems (Amundsen 1999, p.3). Political corruption is also known as grand corruption and in a polity, involves people’s representatives, such as lawmakers, who use their political prerogatives to maintain their power, or increase their wealth, or both. To wit, political corruption is the “corrupt association of high-level politicians dealing with organized business interest” (della Porta & Rose-Ackerman, 2002, p.12). Bureaucratic corruption is a synonym for administrative corruption and involves a civil servant, "at the implementation end of politics" (Amundsen). Despite such a distinction, they may take place in tandem, in a mutually reinforcing fashion. For methodological reasons, the present case study will focus on bureaucratic corruption, although, in real-life, political corruption was also at the core of the swindle; the two were interlinked.

Corruption may entail myriad behaviours that can raise reasonable doubts as to whether they are legal or corrupt, which may include, *inter alia*, gifts and hospitality targeted at specific individuals, facilitation payments, and lobbying (Søreide, 2014, p.241). However, some of the most commonly acknowledged types of corrupt

behaviours are “bribery (use of a reward to pervert the judgment of a person in a position of trust); nepotism (bestowal of patronage by reason of ascriptive relationship rather than merit); and misappropriation (illegal appropriation of public resources for private-regarding uses)” (Nye, 1967, p.419).

Corruption often develops from single actions to a widespread concerted series of actions; it can become systemic. The present case study is an instance of this type of corruption. “Endemic corruption” or “systemic corruption” was explained by Vannucci (2009, p.258), a neoinstitutionalist researcher of corruption, as follows:

> Systemic corruption (…) is based on the development of coordination and selection mechanisms, informal norms and sanctions, the attribution of roles and the distribution of benefits to key actors. It flourishes by building up protective barriers against the internal risks of defection and free riding and the external threat of judicial action and political reform.

As with any other (legal) economic interplay, both corrupt and collusive exchanges display many uncertainties. Some generate transaction costs, which require further consideration. NIE describes the importance of (positive) transaction costs in human economic interactions. Transaction costs comprise all costs incurred in the transfer, capture and enforcement of rights that are essential to the operation of an economic system (Allen, 1999, p.893; North, 1992, p.6). Transaction costs are not circumscribed to the incompleteness and costliness of information coupled with the limitations of the agents’ rationality, as already referred to herein; rather, the concept extends beyond these factors. Information asymmetry, lack of trust, money-transfer costs, and contract-enforcement concerns are also at the core of the idea of transaction costs and represent variables that affect the transfer, capture, and enforcement of rights (Barzel, 1989, p.2-3). Agents will seek to reduce such transaction costs through modifying the underpinning institutions.

First, information is often asymmetrically distributed, which potentially enables one party to take advantage at the expense of the other in a deal (North, 1992, p.7). That is true in different forms of exchanges, but it is certainly more critical in corrupt ones, for instance, as they need to be carried out secretively. The

maximum amount of bribery a firm might find acceptable is not clear to the bribe recipient from the outset, and access to such information is costly. Likewise, the minimum amount of bribery a corrupt public official could find acceptable to conclude an illicit deal is not clear to its counter-party either. Each party can behave opportunistically to maximize their benefits. The protection against opportunism is costly due to needing to negotiate the amount of the bribe. Such negotiation entails further transaction costs, such as time, money, and stress, which the parties would be better off either avoiding or mitigating. The use of brokers (trusted by both parties) to mediate such a negotiation (Bray, 2005, p.115), or simple replication of the bribe agreed upon in a previous deal (Pechlivanos, 2005), are instances of institutional changes intended to reduce the transaction costs of information asymmetry during the bribery-negotiation phase. Therefore, given that at least one party may be incentivized to take advantage at the expense of the other, both parties will invariably attempt to adapt the relevant institutions to reduce transaction costs.

Second, the uncertainties experienced by the actors are likewise augmented if the exchange is impersonal (North, 1992, p.7). Again, in such a circumstance, there is no assurance, in principle, that one party will not attempt to behave opportunistically, and thereby extract undue advantage from the counter-party. Building stronger interpersonal trust, such as friendship bonds, developing other business together, or constructing a reputation as a compliant player are ways of controlling transaction costs emerging from said uncertainties. The less interpersonal trust that exists, the higher the transaction costs. This is even more so in environments of: (i) low institutional trust, in which reliance on interpersonal relationships of trust may be all that is left to players (Rose-Ackerman & Palifka, 2016, C. Institutional Trust); and (ii) low generalized trust, in which, “corruption flourishes where institutions allow trust to relate only to conspirators rather than to the whole of society” (Lambsdorff, Taube and Schramm, 2005, p.7). Therefore, where economic actors are confronted with unreliable institutions and partners, they are incentivized to seek stronger interpersonal trust bonds with partners, frequently based on illegal activities, such as collusion and corruption.

Third, the challenge of transferring large sums of money, which are a product of corruption, demands costly efforts from corrupt partners. To conclude frequent transfers of large sums of money without leaving traces that can be followed by enforcement authorities, corrupt partners spend time and money developing money-laundering methods. One solution is to use intermediaries to manage the process. Layering is a typical money-laundering method, whereby offenders perform multiple successive transfers, using shell companies, before the money reaches its intended destination.

Fourth, transacting actors also need to cope with the possible costs of enforcing an agreement, coupled with frequently unpredictable outcomes (North, 1992, p.8). If one party breaches an agreement, the other will need to incur costs to either revert the breach or seek compensation. In that regard, parties' exposure is higher in agreements of long duration with complex exchanges, whether legal or illegal. This type of transaction cost is of interest to corrupt dealings for two different reasons. In environments where the state-enforcement apparatus, such as the police or judiciary, is too costly, too inefficient, or too unreliable to secure full compliance of legal contracts, the parties may be better off creating private, often corrupt, enforcement institutions. Conversely, enforcement methods for corrupt and collusive deals themselves cannot occur within the state apparatus (Lambsdorff, 2007, p.51-52), whether it is low cost, efficient, and reliable, or not. Consequently, other (always precarious) enforcement mechanisms should be put in place. Hypothetically, in a governance framework where enforcing a legal project contract is foreseen as being highly costly, a public works firm may seek corrupt institutional alternatives, translated into bureaucratic support, to cope with such enforcement-related transaction costs. The bureaucratic agent is expected to assist the firm in ensuring its rights under a legal contract in exchange for a bribe. Curiously, the bribery agreement itself is not immune to enforcement transaction costs. For example, firms need to ensure public officials will not opportunistically renege on a deal after accepting the bribe. A possible remedy is to create another institutional change, for instance, the employment of an intermediary trusted by both parties, to guarantee fulfillment of the corrupt deal in the case of breach by one of the parties. The use of intermediaries provides a relatively more efficient and reliable solution for transacting parties (Bray, 2005). Therefore, both legal and

illegal deals display enforcement-related transaction costs. In both cases, parties will cope by seeking institutional adaptations.

In summary, the parties to a deal need to exchange information, which is often asymmetrically distributed, to set up a deal. Parties also need to cope with the mistrust between them. Finally, they need to ensure complete compliance with the deal once it has been agreed. The costs related to such transactions are present in any economic exchange, but they are higher in illegal exchanges. Parties will shape environmental institutions to mitigate transaction costs and so maximize their utility.

3. Methodology and methods

Application of the NIE framework to analyze real-world phenomena continues to be underexploited, despite its importance to developing the discipline (Williamson, 2008, p.xxvii). “In its current state of development, the economics of institutions still has to identify the regularities and the causal relationships to be examined to check whether the burgeoning theories fit the facts” (Brousseau and Glachant, 2008, p.xlv).

Case studies allow the investigation of real-life contemporary phenomena to better understand the problems faced by economic agents and how they deal with them. Economic interactions are dynamic and institutions are complex. The microeconomic investigation of factual cases can reveal "the games played by agents around the rules they might decide to comply with or not" (Brousseau and Glachant, 2008, p.xlv), the different strategies such agents employ, how they synchronize their actions, and so on. Therefore, the case-study methodology is most appropriate to analyze both legal and illegal economic interactions, because the intention is to exploit in detail their context and the internal functioning of the institutions underpinning both transaction costs and the uncertainties faced by the actors.

In general, critics of case studies point out their limitations regarding the generalization of results from a single case. Such a limitation does exist. However, the methodology displays a unique opportunity to: (i) explore and understand an issue prior to modelling it; (ii) test theoretical hypotheses – in this case, transaction costs; and (iii) more specifically to the application of NIE, to help explain the functioning of the institutions in a given context (Alston 2008, p.121).

The raw data used herein were collected from depositions in the Portuguese language, in 32 court sessions from 26 individuals allegedly involved in wrongdoing; these individuals were mainly from the business and bureaucratic sectors, but also included corrupt intermediaries and politicians. The sessions were video-recorded by the judiciary and made available to the public on the Internet. In aggregate, the analyzed sessions exceed 35 hours in duration. The

deponents were accused of crimes and were attempting to make their defences during the depositions, which may, therefore, result in some bias concerning their version of the facts and circumstances surrounding the offences. However, whereas most of these individuals had previously entered into cooperation agreements (*colaboração premiada*) with the prosecuting authorities – whereby they had to truthfully disclose known facts in exchange for a sanction rebate – they had to deliver at least convincing testimonies. Moreover, and more importantly, as deponents in antagonistic positions described the same facts, it was possible to mitigate the partiality of individual contributions, via cross-examination. Some inconsistencies were detected by public prosecutors, such as that reported by Macedo, Coutinho, and Affonso (2016). In any case, multiple deponents repeatedly confirmed the facts described herein. Those not confirmed by at least a second deponent were avoided, which endows the case description with a reasonable level of external validity. The video recordings are a valuable opportunity to access information about proceedings that took place out of public view for many years. Only rarely can researchers access first-hand reports about collusion and corruption.

In addition to the video recordings, Brazilian and international newspapers for the last three years (2014 – 2016) were explored. Finally, documents resulting from the court proceedings were complementarily taken into consideration.

The facts under observation herein took place over a period of some 15 years; they began to be revealed in 2014, and they are still evolving. Here, the question of bias must be taken into consideration. Although unlikely to happen, with the future unfolding of investigations and trials, additional information revealed may either contradict, or lead to different interpretations of, certain aspects of the case.

Similarly, the proximity in time between the unveiling of the facts and the moment of this research can be argued as another form of bias. Events that are too recent and have not, therefore, passed through the filter of history, are arguably not observed accurately. However, the author disagrees with this position. Even after the passage of several decades, the investigation of the same facts will still be affected by the historical moment of the observer. Any analysis perspective is a

result of its time. Absolute neutrality might be a legitimate goal, but it is an unattainable one.

Another vulnerability of case studies is the subjectivity of the researcher, whose background and individual circumstances relative to the facts may influence the interpretation of the case. The author originates from the country where the events took place and has 15 years of legal service to private firms concerned with infrastructure projects in Brazil and abroad, including public projects. At the time of writing (2016), one of these private firms stands accused of partaking in the wrongdoings in question. Therefore, despite acknowledging the potential effects of researcher partiality, any interpretation of facts – particularly where the objective is to make meaning from human interactions – is unavoidably affected by the researcher's personal circumstances. Conversely, it is possible that this prior professional experience can convey some insight into how infrastructure projects develop, as well as economic agents' standpoint, concerns, and strategies.

In conclusion, the case study is an adequate methodology to examine economic transactions, where the NIE framework is applicable. Notwithstanding the aforementioned partiality caveats – which should be considered by both researchers and reformers when drawing broader conclusions – this research should provide useful insight into the mechanics of collusion and corruption, and into how to tackle them.

4. The case

The so-called Operation Car Wash (Operação Lava Jato) is an investigation that was initiated by the Brazilian authorities in March 2014; it has subsequently revealed a vast corruption scandal involving the Brazilian oil and gas state-owned giant, Petróleo Brasileiro S.A. (the Brazilian Petroleum Corporation, or simply Petrobrás). Petrobrás is a multinational corporation in the oil and gas industry, and the Brazilian government is its majority shareholder. It employs more than 80,000 people, publishes revenues of about USD 100 billion (2015), and is the world's 58th largest company (Fortune, 2016). The Federal Public Prosecutor's Office (2016) deemed it the largest known corruption case in the history of the country. Involving collusion and illicit payments, among other crimes, such as money laundering and political corruption, it resulted from a "sad perfect storm" of incentives for improper payments (Rose-Ackerman, 2016b).

The plot under analysis herein comprised two main groups of actors: (a) construction firms organized in a cartel, and (b) high-ranking bureaucratic officials from Petrobrás. They acted in concert to raid the Petrobrás coffers. The case also involved politicians, who benefited from the swindle, receiving political campaign donations from construction firms and then appointing corrupt bureaucrats to ensure smooth operation of the system. The extent of political corruption in the case will not be analyzed herein, although it is integral to the case.

The illegal transactions were carried out from 2004 to 2014, approximately, under the respective governments of President of the Republic, Luiz Inácio Lula da Silva (2003–2010), and President of the Republic, Dilma Rousseff (2011–2016), both from the Workers' Party (*Partido dos Trabalhadores*, or *PT*). This period coincides, to a large extent, with dramatic oil-price rises from the year 2000 and beyond, and with consequent investments in the related infrastructure. These circumstances contributed to the creation of strong incentives for the parties in question to circumvent the existing licit rules to maximize their utility. Until 2000, real oil prices only exceeded USD 30 per barrel in response to conflicts in the Middle East (Williams, 2011). During the ensuing decade, however, oil prices broke several records, even exceeding USD 140 per barrel in 2008. The high average price of

the commodity (c. USD 70 per barrel between 2003 and 2014) (Statista, 2016) helped initiate intensive infrastructure investments in Brazil concerning the production, transportation, and refinement of oil to exploit contemporary economic opportunities. Petrobrás alone was expected to incur capital expenditure of USD 130 billion through 2019 (Valle & Spinetto, 2015). The protagonists adapted their relationships, which will be demonstrated herein, to extract the maximum amount from such an influx of capital.

The private cartel comprised Brazil's larger engineering construction companies (CADE & CCCC, 2015), and it was called the "Economic Nucleus" by the Federal Public Prosecutor's Office (2015). The cartel competed as Petrobrás suppliers in projects such as oil platforms, gas pipelines, refineries, shipbuilding, and other mega-projects. The cartel members mainly belong to domestic conglomerates. For years, they colluded to defraud the procurement process for various capital-intensive projects commissioned by Petrobrás. In addition to collusion, cartel members made illicit payments, based on a percentage of the infrastructure contract price, to high-ranking bureaucrats from Petrobrás, as well as to politicians and political parties (Machado, 2016; Mendonça, 2015; Camargo, 2015; Pessoa, 2015; Costa, 2015; Youssef, 2015; Barusco, 2016). The swindle was systematically repeated for years, without any major disturbance.

The high-ranking public officials from Petrobrás – also known as the "Bureaucratic Nucleus" (Federal Public Prosecutor's Office, 2015) – were receiving some of the illicit payments made by the companies. The Petrobrás public officials in question are qualified professionals, mainly engineers, who, at a certain point in the years from 2000 were promoted to high management positions within Petrobrás (Costa, 2015), with high levels of licit remuneration and considerable prestige. They subsequently entered into bribery agreements with public works firms and were appointed and maintained in bureaucratic posts by politicians from the governing coalition, who also benefited from the swindle (Barusco, 2015a; Barusco, 2016; Youssef, 2015).

The multiple actors from the two groups organized an intricate network, which comprised numerous bilateral relationships, both legal and illegal. The next section

will present the failures of the governance framework that fostered particular uncertainties – some of which generated high transaction costs – in the *legal* relationship, namely the one between public works firms and Petrobrás (and its bureaucrats). In addition, this section will reveal how the parties responded to such failures by creating new illegal governance mechanisms. However, a comparison will show that these mechanisms, based on collusion and corruption, were not immune to numerous uncertainties and high transaction costs. Therefore, the parties had to adapt once again, taking additional measures to deal with the particular features of illegal dealings. The overall purpose of such a comparison is to guide reforms in implementing institutional changes that can: (i) decrease particular uncertainties and transaction costs of legal dealings; and (ii) increase some of illegal dealings.

4.1. Transaction costs of legal dealings

The public works firms ultimately sought to maximize their gains. Such maximization naturally entailed, *inter alia*, mitigating uncertainties and reducing costs. Some uncertainties generate high transaction costs. From the firms´ perspective, uncertainties are abundant both in the bidding phase for Petrobrás projects and in the execution phase. *Mutatis mutandis*, the same applies to the Petrobrás officials responsible for dealing with the hired firms.

a) The bidding phase

In the context where impersonal competition is the norm, public works companies could reasonably doubt whether they would be: (i) invited to participate in a bidding process carried out by Petrobrás; and (ii) later awarded a contract or not. A market with effective competition would increase firms' transaction costs because exchanges tend to become impersonal (North, 1992, p.8). Competition within the Petrobrás supplier market was considered fierce. "The opening of the economy to international competition in the 1990s caused a sharp drop in prices of industrial products" (Camargo, 2014) and services, followed by increasing competition in domestic capital-intensive projects. Clearly, this uncertainty, as seen by the companies, aligns with the government´s best interest, and, therefore,

should not be deemed a failure of public institutions. However, it represented high transaction costs for the bidding companies, which could jeopardize their market positions.

The context is one of low generalized trust; when asked whether “most people can be trusted”, 92.2% of Brazilians replied that “we need to be very careful with people” (Institute for Comparative Survey Research, 2016, p.4). Similarly, there is little institutional trust; a firm might reasonably assume its competitors are paying bribes to enhance their chances of success. According to Bray (2005, p.114), 55.8% of companies in the public works and construction sectors reported losing business deals in a five-year period because a competitor paid bribes. The industry is known as one of the most vulnerable to corruption (Transparency International, 2011, p.20). Likewise, in an environment of such impersonal relations, Petrobrás officials could reasonably expect a difficult relationship with public works firms, thereby putting their performance aims at risk.

In the present case study, the public works firms might also doubt whether a competitive price they were about to offer could accommodate both the unpredictability of the project-execution phase and the optimal levels of profit sought. Project complexity and dimensions tend not to allow for oversight. Moreover, the firms were operating in an environment where information was scarce and which defied accurate prediction by the firms themselves, Petrobrás, or any other parties. These megaprojects were considered highly sophisticated from a technical standpoint, and while similar projects had been carried out in other parts of the world, the price determination for each of these projects was unique. Therefore, price determination was a significant challenge for the contracting companies. The difficulties of evaluating exchange costs and benefits, primarily in determining proposal prices, represented high transaction costs for firms.

Even if information were not scarce, firms might have lacked sufficient capability to perform a comprehensive analysis within the typically constricted timeframe (Negrão, 2016). Generally, time was a critical factor as Petrobrás had to complete infrastructure projects to meet the country´s development demands and to profit from increasing oil prices (Barusco, 2015a; Costa, 2015). Such a constraint

affected Petrobrás officials likewise because implementing infrastructure projects was part of an overall government development plan. If projects were not executed timeously, key public officials' positions could be jeopardized.

Finally, during the bidding phase, both contracting firms and Petrobrás would need to deal with another transaction cost: that relating to legal challenges of the Petrobrás bidding committee's decisions and acts. Both administrative and judicial challenges could be costly. Both the firm and Petrobrás would need to engage lawyers to protect their interests, beyond investments of time and other internal resources. From the company's perspective, such investments might not render any reward whatsoever because it might not be awarded the contract sought. From Petrobrás officials' perspective, such contention could place the timely implementation of the project at risk, in addition to the expenditure necessary to carry out the contention proceedings. The control of said problems, if ever possible, was expensive, time-consuming, and stressful.

b) Project-execution phase

While dealing with Petrobrás, both project bidding and execution phases involved high transaction costs. After a project had been successfully awarded, the winner and Petrobrás would sign the relevant contract, which set out the terms and conditions. These would usually be incapable of addressing all possible contingencies that could arise during such a complex, long-lasting execution, which would pose critical problems regarding monitoring and enforcing the deal. Intricate capital-intensive projects involve many different suppliers, such as detailed engineering, equipment supply, construction, electromechanical erection, commissioning, and pre-operation, which entail numerous subcontractors that must be managed by the bid winner. Furthermore, these projects often involve severe natural conditions, such as installing pipelines across the Amazon jungle, or working in hazardous environments, including carrying out improvement works in operating refineries or oil platforms, to name but a few. The full execution of those agreements could last for some years. The transaction costs concerning uncertainties in the contract-execution phase were often insurmountable for both

the contracting firms and Petrobrás, and mainly for the Petrobrás official responsible for managing contract performance.

One instance of such an information-related transaction cost involves the fact that proposals were prepared based on a basic engineering design for the project (Pessoa, 2015). As Petrobrás wanted to expedite infrastructure implementation, the bidding process was conducted without a detailed engineering design, which normally contains specifications for equipment, execution drawings, more accurate descriptions, and so on, which enable a more precise cost to be provided. This was a significant information-related transaction cost that the parties could not avoid, given the time constraints. It meant that companies had to submit bidding prices (albeit overstated), and subsequently sign a contract with a low degree of predictability concerning the project's technical specifications, of which not even Petrobrás was fully aware.

The detailed engineering design was concluded after contract signing. Elaboration of the detailed design enabled the parties to obtain a more comprehensive view of the project. Therefore, the contracting parties convened again to negotiate the contract´s first amendment (Costa, 2015), where the price and other relevant provisions of the agreement were adjusted according to the better understanding of the project offered by the detailed engineering design. Although the detailed engineering design was carried out by the newly contracted bid winner, who could opportunistically manipulate it to increase the final price, the contract-adjustment negotiation was likely to be difficult. Because it was a negotiation, rather than an automatic amendment, the debates entailed further transaction costs to the parties.

Finally, during contract execution, the suppliers also had to deal with tight schedules in technically complex environments, such as working in operating plants, or under severe weather conditions, all of which were compounded by an environment with abundant red tape. The internal rules of Petrobrás, as typically seen in state-owned firms in Brazil, followed myriad regulatory procedures that usually led to inaction or delayed action by public servants. Interacting with Petrobrás staff by the rules was expected to be time-consuming, stressful, and

expensive; even worse, interactions could lead nowhere, or even result in retaliation against any firm resorting to confrontation. Therefore, a good relationship with high-level executives in the oil company would mitigate the transaction costs of navigating the Petrobrás bureaucracy.

4.1.1. Illegal dealings as a response to the transaction costs of the legal governance framework

Given a legal institutional framework that generated myriad transaction costs, the firms and Petrobrás officials engaged in its modification to redefine their relationship and extract higher benefits. Collusion, coupled with bureaucratic corruption, was at the core of the new approach. However, these illegal dealings also presented particular uncertainties.

a) Collusion

The uncertainties of the legal dealings described above – mainly those related to the bidding phase, such as doubts about being invited to bid, or being awarded a contract, and about the lack of trust between firms within the market – were perceived as being too high to allow maximum utility to the companies. “Effective competition acts as an essential constraint in efficient impersonal markets” (North, 1992, p.8). The group of public works firms deemed collusion between themselves as one of the solutions for such obstacles, and they set up a cartel. This later became known as the “Economic Nucleus” of the Car Wash swindle, although the firms used to call it “The Club” (Mendonça, 2015). They colluded to share Petrobrás projects between themselves. The testimonies of parties involved during the Car Wash trial are inconsistent about when the cartel started and ended its activities. However, it was unequivocal about its more intense operations during the second half of the 2000s, which is the period with a higher demand for infrastructure from the Brazilian state oil company. Some ten firms composed its core, which comprised the most powerful subgroup within the cartel. However, there is no consensus about the complete list of participants, although it might have involved 21 companies within a given period (CADE & CCCC, 2015).

In the cartel's conversations, the members determined their preferred Petrobrás bids, and agreed on mutual support toward accomplishing their aims. The initiation of such talks was not difficult as cartel members already had a long history of legal interactions between themselves, and possibly also illegal interactions involving collusion in bids for organizations other than Petrobrás. The companies and their representatives were known in the Brazilian market, as most of them had been acting in that environment for decades. Some companies had been established for as many as 60 years and belonged to traditional conglomerates owned by some of Brazil's richest families. Many of these firms had previous experience working together on other projects, and two or more of them had often worked together in legitimate infrastructure works, in consortia, joint ventures, subcontracts, and so on. As often happens, misconducts that are dependent on trust develop gradually from prior, frequently licit, relationships (Lambsdorff & Teksoz, 2005). These firms also relied upon a professional association, set up in 1964, where sectoral matters of interest were discussed (Pessoa, 2015). This organization is Associação Brasileira de Engenharia Industrial (ABEMI; Brazilian Association of Industrial Engineering). Above all, these firms shared similar concerns about market constraints. Opportunities to develop anti-competitive activities in the context of Petrobrás projects were set, and firms perceived the legal governance framework as being less advantageous than its illegal counterpart.

The group formed by the companies was based on trust and reciprocity, not only because they had already conducted business together several times in the past, but because they also shared the same concerns. Hence, their convergence could help overcome the obscurities resulting from doing business with Petrobrás. According to the depositions of executives (Mendonça, 2015), member companies convened periodically to negotiate the distribution of specific contracts. The companies identified and disclosed their preferred projects, according to their internal strategies, expertise, and financial capabilities. They intended to streamline the distribution of the workload between the various members. If the cartel did not exist, the companies would need to target many more projects in a given period to decrease the risk of ending up with no market share. Following these negotiations, one firm or more firms (in projects requiring joint execution) were allowed to submit a more competitive proposal in a given tender, with the

support of others. The others either abstained from participating in the particular bid, or submitted a mock proposal within a non-competitive price range, known as "cover pricing", according to the instructions of the designated winner (Pessoa, 2015). Therefore, after a collusive agreement was achieved, the designated winner prepared, *inter alia*, its proposed price for submission to the Petrobrás bidding committee. This price would be as high as possible, but always within the maximum price estimated by Petrobrás, to avoid cancellation of the bid (Costa, 2015). According to the applicable rules, if no feasible proposal was submitted within the Petrobrás estimated price range, the relevant tender had to be cancelled, and a new one had to be called (Costa), which was an obstacle to be avoided. The cartel rotated access to projects in such a way as to provide all participants with fair access to projects (Pessoa). The CEO from one cartel member firm estimated that the agreements within The Club resulted in the elimination of 70% to 80% of the competition in a given tender (Pessoa). Therefore, information deficiency about the market and competition were mitigated by collusion.

In addition, it was also part of the cartel agreement that another uncertainty, which could generate high transaction costs, could then be avoided. Namely, the ability to avoid expensive and time-consuming legal remedies to challenge the Petrobrás bidding committee’s decisions (in both administrative and judicial spheres), which are typical in markets where competitors fight for awards. Such an arrangement based on trust became known as a "non-aggression pact" within the clique (Pessoa, 2015).

The collusive agreements between firms also rendered indirect rewards to Petrobrás officials, reducing some of the transaction costs faced by the officials. Petrobrás was being pressured by the government to upgrade its complex infrastructure, as well as to implement new infrastructure, within a relatively short period. If capital-intensive projects were not concluded timeously, bureaucrats could be removed from post, as such a failure could expose the government’s general economic development plans to risk. It therefore proved convenient to have an ordered, qualified, and stable group of suppliers (organized in a cartel) to accomplish such aims. Moreover, because time was a critical factor, prolonged

bidding processes – where rejected bidders always challenge tender-committee decisions, both administratively and judicially – could jeopardize timely contract initiation. Therefore, the “non-aggression pact” between firms was also convenient to bureaucrats; while they knew about cartel activities, they just overlooked them.

Given an environment with several transaction costs generated by abundant uncertainties, the contracting companies and Petrobrás officials started to exploit opportunities to build other relational mechanisms. Collusion was not the only response to obstacles created by the failed legal governance framework; corrupt exchanges between the firms and Petrobrás officials were also developed with the aim of maximizing utility.

b) Bureaucratic corruption

The companies were supposed to face numerous uncertainties in interactions with Petrobrás, both during the bidding phase and during the execution phase of a project. In addition to collusion, bureaucratic corruption was an attempt to mitigate such challenges. Despite its inherent high transaction costs, corruption – in the form of bribes paid by firms to Petrobrás executives – was deemed to make deals more predictable and profitable. Corruption was therefore part of the novel private governance framework created by the parties.

Illicit payments to bureaucrats frequently corresponded to 1% of the amended global price of the contract, although it could exceptionally vary from a little less than 1% to as much as 3% (Barusco, 2015b; Costa, 2015; Pessoa, 2015). A portion of 1% of the contract price was intended for the high-ranking public officials.

Counter-intuitively, in the Petrobrás case, the simple logic of receiving bribes to secure the award of a contract does not apply. The high-level executives in question did not have enough discretion over the bidding process to solely determine the final winner. In addition, the people who were ultimately responsible for the bidding process did not receive bribes. Formally, the winner had a more competitive price (albeit determined through cartel collusion) and sufficient

technical and financial qualifications to undertake the contract. The advantage in this regard was that bureaucrats could offer something else in exchange for bribes: they could mitigate the uncertainties of competition between public works firms.

Petrobrás had developed relatively sophisticated procurement processes and systems. To be invited to any bidding process, a company needed to be previously admitted onto the Petrobrás list of qualified suppliers for specific types of goods or services. Any new bidding process entailed issuing an invitation to companies previously deemed qualified. The bureaucrats did not have the final word on determining the winning company, but they did have power to influence the list of companies invited to certain tender processes (Barusco, 2016). This was where the bureaucrats could act and exploit the institutional framework. They had a "service" to offer the members of the cartel, namely, manipulating the shortlist. Officials thereby overcame firms' first obstacle, that is, not being invited to a given tender.[2] The public agents avoided inviting some qualified competitors not involved in the cartel. The ultimate decision about the winner was then made by the tender committee, but in reality, it had been manipulated by the cartel, through the aforementioned bid-rigging. Therefore, officials started justifying receipt of their bribes as they secured invitations to bid for bribe-payers, which means that corruption reduced this particular unpredictability in procurement processes.

As previously mentioned, determining the project price entailed considerable inaccuracy, given the complexities and uniqueness of each project. Although this factor generated a high transaction cost for the parties, it was a valuable opportunity for companies to maximize their benefits because they could super-inflate prices, with a relatively slim risk of opposition from Petrobrás during negotiations. Such situations are usual in worldwide industry, where "contracts are usually large and construction projects are often unique and therefore difficult to benchmark for costs and time. This makes it easier to hide and inflate additional expenditure" (Transparency International, 2011, p.20).

In the present case, the firms had three opportunities to overestimate project price: (i) during bid-rigging; (ii) while preparing the detailed engineering design for the

project, where quantities and specifications could be inflated; and (iii) during negotiations for the first contract amendment. Those opportunities were more easily exploited with support from within Petrobrás, namely, from self-serving bureaucrats. In addition, firms had to seek approval of a certain final price that entailed the technical details of the project and any upcoming contingencies of the contract-execution phase. However, that price also had to include: (a) the illicit payments meant to ensure smooth operation; and (b) extreme profits. For instance, in one refinery project alone, which was worth about USD 1.6 billion, the Brazilian authorities have detected over-billing of about 25% (Fabrini, 2016). Therefore, one of the functions of the bribes paid to Petrobrás officials was acceptance of inflated prices proposed by contracting companies. To a large extent, bribery helped firms avoid predicted transaction costs concerning such price approvals, mainly after the contract award.

Streamlining the internal approvals process was of particular importance to contracting companies. Corrupt officials would expedite such processes throughout the complex bureaucracy (Costa, 2015). The higher the amount of a new contract, the more internal approvals were required. The various approvals had to be granted upward, and successively, according to the amount involved. Such processes could take up to one year, if not for the internal support of bribe recipients (Pessoa, 2015). Although corrupt officials were often not the final approvers, they could either cause the final consent to unfold smoothly, or block its advancement.[3] (Costa, 2015)

According to bureaucratic corruption agreements, high-ranking officials also had to reduce other transaction costs of the companies in exchange for bribes. For example, officials would leak confidential information about upcoming projects and other confidential criteria due to be applied by the Petrobrás bidding committee (Barusco, 2016). Such privileged access to information made cartel deliberations easier and more credible, endowing the process with an appearance of full compliance with the norms.

During the project-execution phase, executives continued to assist companies in exchange for payoffs. The projects were complex, full of unexpected events, and

governed by incomplete terms and conditions. The officials not only actively supported bribe-payers in solving everyday problems during the project contract execution – such as timely release of payment instalments, renegotiation of the project schedule, and approval of new price amendments – but also abstained from creating additional problems. The bureaucrats offered shortcut solutions to obstacles in the governance environment. Likewise, in an environment with excessive red tape, there were many opportunities to create artificial obstacles to service providers (Dalmaso, 2016). The self-serving officials exploited the “business” of obstacle-removal (i.e., reducing the companies’ transaction costs) during project execution as a way to secure bribe payments. Corruption and red tape in Petrobrás had a symbiotic relationship, where bribery was reinforced by red tape, and red tape was reinforced by the expectation of bribes (Rose-Ackerman & Palifka, 2016, II.Bribes as Incentive Payment for Bureaucrats). At this particular point, bribe requests sometimes became extortion. Although some bureaucrats deny it (Barusco, 2015b; Costa, 2015), there were instances of delayed payment instalments under the project contract because the business side had failed to pay bribe instalments to the recipients (Costa). Moreover, one of the Petrobrás officers also revealed that a defaulting firm would not be shortlisted for future tenders (Machado, 2016). According to the CEO of one of the cartel companies, “although the Petrobrás [corrupt] officials had limited power to assist, they had an almost unlimited potential to harm" (Mendonça, 2015).

Despite of the use of bribery to circumvent excessive bureaucracy in the state-owned company, this is not a case of "efficient corruption" where bribes are paid to enhance economic efficiency, without further harm to wider society (the so-called "greasing the wheels" hypothesis), argued by Nathaniel Leff (1964) and others. This is the case because bureaucratic corruption in Petrobrás was only a small cog in the much larger machine of the swindle, which was evidently detrimental to Brazilian society, which will be proven as follows.

So far, analysis has been presented to show how construction companies and Petrobrás public servants dealt with inherent uncertainties and specific transaction costs in legal dealings, that is, how they solved them by altering the governance framework where both collusion and corruption became the rule. The following will

present further detail about the new and illegal governance framework, its particular uncertainties and transaction costs, and how the parties tackled them via myriad adaptation measures to maximize their utility.

4.2. Transaction costs of collusion and corruption

Both licit and illicit economic exchanges display numerous uncertainties that produce transaction costs concerned with access to, and assessment of, information, deal enforcement, impersonal relationships between parties, and so on. Collusive and corrupt agreements, however, comprise particular features that cause their transaction costs to be higher than in legal transactions. There are several instances of such transaction costs affecting wrongdoers in the Petrobrás case. The following are the most relevant. In such illicit exchanges, the transfer and evaluation of information both about the terms of the deal and the partner are made more difficult due to secrecy requirements where the deal must be hidden from third parties. Moreover, enforcing such agreements cannot rely upon state apparatus, which makes them more costly and unpredictable; therefore, opportunism is a latent possibility (Lambsdorff, 2002). Finally, frequent transfers of large sums of illicit money require a sophisticated scheme to conceal its origin, beneficiary, and purpose. Therefore, the parties in question had to adapt to a new set of uncertainties resulting from collusion and corruption, which were reciprocally useful in controlling transaction costs.

4.2.1. The complementary relationship between collusion and corruption

Although corruption and collusion are different offences, they often occur in tandem, mainly in the context of public procurement (OECD, 2010a). As will be demonstrated, the cartel's collusive activities assisted the parties to reduce several uncertainties that create transaction costs inherent to corruption. Likewise, corruption helped companies control the transaction costs of collusive dealings. They were complementary and mutually reinforcing (Lambert-Mogiliansky & Sonin, 2005). To wit, if one of them were absent, the other wrongdoing would become more unpredictable to at least one of the parties involved. Despite also analyzing

the combination of collusion and corruption from the bribe-recipients' perspective, the economic-nucleus standpoint has been selected for this study, as it was the only one directly participating in both forms of misconduct.

a) Collusion reduces the transaction costs of corruption

Both the business side and the bureaucratic side actively contributed to organizing corrupt exchanges and had to deal with a particular set of problems to conclude them. Collusion was a solution to many of these problems, which included access to information, initiation and negotiation of the deal, and opportunism in and enforcement of corrupt deals by both companies and bureaucrats. Moreover, collusion helped companies dealing with biased perceptions about the corrupt deal.

The information about the terms and conditions of the corrupt transaction, as well as about companies´ corrupt partners, is typically deficient, mainly due to the secrecy protecting such agreements. The cartel helped mitigate such obstacles as it enabled information exchange between colluding firms about previous deals. The businesses could count on their network to communicate abuses by opportunistic, corrupt officials who had perhaps attempted to extract bribes higher than the amount usually charged for similar projects in the market. Intra-cartel communication was a way of assessing the cost and benefits of a corrupt transaction by comparison with previous exchanges of a similar type. Ultimately, the cartel attempted to rebalance the asymmetric distribution of information between bribe givers and takers. Moreover, the identity and reliability of a given corrupt official could also be exchanged between companies. Bureaucrats who were unknown to other firms, or who had proven untrustworthy, were likely to be avoided by bribe givers, thereby reducing any risk of embarking in a bribe agreement that was destined to fail.

Furthermore, if companies were competing without a cartel to win a contract tendered by Petrobrás, one of them would be exposed to unpredictable attempts by competitors to seduce the demand side with more attractive corrupt deals. The demand side would then be able to opportunistically "auction off" a Petrobrás

project (or sets thereof) for the highest bribe. Such a scenario could even incentivize a corrupt official to renege on an already-agreed transaction for a more lucrative one. Opportunism would thereby be stimulated.

Such opportunism would be critical to all cartel members, but it would be particularly harmful to smaller firms. The companies displayed different levels of financial and technical capabilities, with smaller and larger firms competing in the same market. Therefore, larger companies would have better capability to persuade their corrupt partner to give them preference. Theoretically, although any company, of any size, could make illicit payments by adding the amounts to the contract price, only larger firms could offer a more comprehensive package of advantages to the bribe receivers. Hence, bribe takers would naturally be more inclined to deal with fewer, larger companies than myriad small firms as this would reduce officials' exposure. Larger firms could participate in a wider range of capital-intensive projects regarding complexity, dimension, and location, thereby providing greater potential for stronger, longer-lasting commitments with corrupt officials.

Moreover, without the bond of trust between companies of different sizes, a logical reaction from smaller firms could be expected. If excluded from deals, they could strenuously challenge tender boards' decisions, in both administrative and judicial spheres, thereby jeopardizing the scheme's equilibrium and adding more transaction costs. Smaller companies knew the market well as they had worked with Petrobrás long before the more intensive infrastructure investments began during Lula da Silva's government.[4]

In any case, the realization that firms were organized in a group discouraged corrupt officials from "auctioning off" a Petrobrás project in exchange for the highest bribe. It also provided a disincentive to officials to renege on the corrupt deals. Therefore, an official had to build a reputation for compliance to keep the corrupt system operational and, therefore, guarantee future gains from upcoming projects. As Petrobrás planned to execute many capital-intensive projects within a few years, it made sense to ensure overall smooth system operation, rather than aiming for maximum one-off benefits.

The cartel's existence also altered the companies' perception of corrupt deals and decision-making processes. The cartel affected the individuals' "mental models" (North, 1992, p.8) toward corruption, as it was taken for granted that corruption was a must, and that all other players had experimented and succeeded with that approach. The exchange of information between firms made crime appear normal, as part of the existing rules, and without any feasible alternative (Azevedo, 2016). The normalizing tone of corruption originated from peers, some of which were the largest and most well-equipped companies in the sector.

In a case of non-systemic corruption, a cartel could be perceived as an obstacle to the interests of bribe receivers, and they would possibly attempt to combat it as collusion could limit their (one-off) gains. However, in case of systemic corruption, it was convenient for the bribe receiver to consent to collusion as it would bring stability to the overall scheme, which entailed many projects. That is so, mainly because of limiting the number of competitors in repeated operations. Collusion was also an effective response to transaction costs faced by bureaucrats while carrying out illegal dealings. Such transaction costs include: initiating negotiations with bribe givers from the beginning every time a new opportunity emerges; negotiating terms and conditions for corrupt transactions; and managing and responding to defection.

Setting up a corrupt deal would be troublesome to public officials because disclosing their intention to collect bribes could expose them to denunciation from a clean company. The more firms they approach, the higher their risks. If an official finds a firm that is willing to transact, negotiating the terms and conditions of the *quid pro quo* would require these high-level professionals to invest time and money, and to endure the stress involved in conversing about illegal matters. Finally, should the official overcome such hurdles, it would be necessary to take measures to avoid defection and, should it occur, to deal with it.

The organization of the companies in a cartel was convenient for the bribe taker as it reduced at least three types of transaction costs of the corrupt deal. First, it was possible to assume that one colluding firm, designated by the cartel to win a

project, had tacitly and previously accepted the requirement to pay bribes. Second, the terms and conditions of the deal would be close to a replicate of previous deals entered into by the firm´s peers. Finally, the costs involved in the possible defection of a company were mitigated as the official could refer to the cartel should a company renege on a deal. Such a breach could result in peer pressure being applied to the defaulting firm as it would inconvenience the group as a whole, should the scheme become unstable. Therefore, the transaction costs faced by the bribe takers concerning the verification of the counterparty's willingness to pay a bribe, the negotiations of the terms and conditions of the bribe deal, and the management of the counterparty defection were partially reduced by the existence of the cartel.

In conclusion, to some extent, it was preferable for companies to unite and exchange strategic information about corruption, and to mitigate the cost of opportunism of bribe takers. Conversely, it was convenient for self-serving bureaucrats to deal with repeated operations using a market comprising a limited number of companies, rather than deal with a multitude of non-committed firms. In this way, several transaction costs of corruption faced by both parties were efficiently tackled by collusion, such as access to information, initiation and negotiation of the deal, and opportunism in and enforcement of corrupt deals. Collusion also helped companies deal with biased perceptions of the corrupt deals.

b) Corruption reduces the transaction costs of collusion

Similarly, private collusion generated novel concerns, some of which involved corruption as an ideal remedy. At first glance, collusion without the expense of bribery could maximize gains by the Economic Nucleus, as deals would become less costly to them (Rose-Ackerman and Palifka, 2016, C. Nodes of Corruption). However, in the context of multiple projects being tendered over a period of years, stability had to be achieved to perpetuate exploitation of these opportunities. The companies found it more convenient to accept public officials using Petrobrás project contracts to conclude corrupt deals. In addition to challenges such as developing a mechanism to distribute Petrobrás projects within the clique, or

preserving operational confidentiality, the cartel had to tackle the following problems: (i) maintaining market size, mainly to avoid relationships becoming impersonal; (ii) preventing both legal and illegal measures against collusion by Petrobrás; (iii) receiving privileged information from within Petrobrás to guide cartel strategies, thereby increasing its efficiency; and (iv) creating an effective enforcement method to avoid defection from the cartel (McAfee & McMillan, 1992; Lambert-Mogiliansky, 2011; OECD, 2010a; Søreide, 2014). Each of the four concerns – to which corruption was seen as one satisfactory solution – will be analyzed next.

First, the public works market created by Petrobrás was highly lucrative and therefore attracted considerable interest. The Club comprised some 20 entities in a given period, and many others, especially international firms, coveted this opportunity. Ultimately, Petrobrás had the power to set practical boundaries in the market; as the client, it decided the shortlist of invitees for individual tenders (Costa, 2015). If Petrobrás had allowed many more participants in the bids, the newcomers would probably create pressure to enable them to enter the collusive agreements, thereby jeopardizing the stability of personal relationships developed thus far. Consequently, it would become more difficult to manage the cartel, and its ultimate aims could be put at risk. Therefore, the permanent delivery of bribery caused the corrupt bureaucrats to limit invitations to the set of colluding companies, thereby deterring the entry of strangers and reducing the transaction costs related to impersonal relationships within the cartel.

Second, Petrobrás had the means to combat cartel formation, for example, via cancelling rigged bids, initiating investigations, or reporting it to the enforcement authorities. As one of the largest buyers in the marketplace, Petrobrás measures against collusion could have had a great effect on the construction industry. Bureaucrats were tacitly committed to refraining from acting against private collusion in exchange for illicit payments; they were locked into the deal. The companies could rest assured that collusive transactions would remain untouched by officials – to whom the winner of the bids was irrelevant, provided that the winner belonged to the cartel and made the bribe payment. Ultimately, the

distribution of the projects remained squarely under the control of the colluding bidders during the entire process.

Third, firms' collusion was made easier by the existence of a bureaucrat within Petrobrás who furnished them with strategic information on future bids and projects (Skornicki, 2016). Such an insider provided companies with non-publicly available data, including details of the long-term plans of Petrobrás regarding infrastructure projects. Access to privileged information, made possible through corruption, was used to optimize cartel deliberations. Participants could then better plan the distribution of projects over time, strengthening ties between the firms as every company benefited from the informational advantage. This particular vulnerability inherent to collusion – that is, the need for sufficient information to better set strategies for the sake of the group – was mitigated by employing corruption.

Fourth, in illegal agreements, parties cannot count on an enforceable written contract. The cartel's inside dealings were no different. The Club members had to rely on verbal agreements between themselves, which naturally made it relatively harder to combat defection. Here, corruption came into play. The firms counted on the Petrobrás bureaucrats and their respective intermediaries to act in cases of breach of collusive pacts. The bribes served as remuneration for such third-party enforcement services. There are at least two instances of companies that violated cartel agreements concerning a Petrobrás bid. In both cases, the network of corruption was called upon to threaten the breaching firms with retaliation. Defectors, in cases of repeated infraction, would no longer be invited to future Petrobrás tenders. This approach forced at least one company back to overall commitment (Youssef, 2015).

Therefore, the characters in this case consensually preferred certain illegal institutional adaptations, mainly corruption and collusion, rather than facing the struggle of working within the law. Although not immune to particularly high transaction costs, the adjustment was deemed to be, in general, less unpredictable and more conducive to maximizing gains. The transaction costs of illegal dealings also had to be tackled. In addition, collusion operated as a reaction

to the transaction costs inherent to corruption. Similarly, corruption was considered an efficient solution to the specific transaction costs of collusion. Therefore, both misconducts were mutually reinforcing. As a result, the illegal exchanges gained equilibrium, becoming systemic. Another institutional change with the same purpose was the employment of financial intermediaries, which will be shown in the following section.

4.2.2. Financial intermediaries

The wrongdoers in the present case either employed, or consented to the employment of, a combination of corruption and collusion to mutually tackle some uncertainties. However, another essential initiative was put into practice: the engagement of intermediaries. The firms and the bureaucrats might not have been able to carry out such a broad, systemic collusion and corruption enterprise without the assistance of financial operators, also known as the “Financial Nucleus" of the Petrobrás scheme. The beneficiaries of the swindle widely employed intermediaries to mitigate the transaction costs typical of corrupt exchanges and some resulting from collusive deals.

Although they had multiple functions, intermediaries were mainly responsible for receiving illicit money from construction companies and furtively delivering it to recipients, in exchange for a fee. The recipients and intermediaries normally had a strong trust relationship, which often preceded the corrupt activities (Husted, 1994, p.24). Intermediaries frequently referred to the demand-side individuals as "friends" because they knew each other´s families, played golf together, were partners in other licit business, spent vacations on the beach together, and so on (Barusco, 2015b; Góes, 2015; Soares, 2015; Youssef, 2015). Such strong bonds were consecrated by time and repetition. Some had parallel licit activities, mainly within the oil and gas industry (Góes; Skornicki, 2016). Not one case of intermediary defection was found. Later, the intermediaries also developed a trust relationship with the supply side, thereby endowing the network with more stability. A successful broker must have a reputation for compliance with the rules of corrupt deals (Lambsdorff, 2007, p.149). One such intermediary declared: "The businessmen had a special opinion about me, as I have always been a compliant

guy. They knew that every cent that would pass through my hands would reach its destination without deviation or cheating" (Youssef).

Secrecy is a vital factor in corrupt agreements because of the obvious fact that these deals are not legal. Intermediaries were key in mitigating relevant transaction costs, often allowing the main parties to remain somehow distant from illegal negotiations. The existence of these intermediaries provided other parties with an ostensibly higher level of secrecy and identity protection, but also the impression that the intermediaries shielded them from both being caught and being extorted by the counter-party following the deal's conclusion (Lambsdorff, 2011). Thus, givers and takers did not need to expose themselves to meetings or other direct interaction to exchange information. The intermediaries managed communications, and they were frequently responsible for granting private access to public officials who the companies would not otherwise have had access to (Soares, 2015; Youssef, 2015), and vice versa. Finally, one party had to count on an intermediary to verify the other party's disposition to deal and the intended terms of that deal. Ultimately, the brokers were supposed to manage the two-way flow of information between them and to safeguard corrupt participants while the transaction took place.

Evidently, an illegal deal has no protection from the state's enforcement apparatus. On one occasion, for instance, an intermediary carrying the equivalent to USD 35,000 in cash bribes to a Petrobrás official was robbed on a street in Rio de Janeiro (Netto, 2016, Section: Destruir E-mail Sondas). The intermediary could not report the crime to the police. However, much riskier than the potential for losing large amounts of cash, is the possibility of a party reneging on a corrupt agreement. The intermediaries were often responsible for controlling such risks and pushing deals toward completion (della Porta & Vannucci, 1999, pp.153-176). In several instances, intermediaries pressured parties to comply with the demands of the counterparties including bribe deposits, or favours during contract execution, or in certain congress activities. Because the temptation to behave opportunistically was present, this had to be addressed by the intermediaries. Ultimately, they filled the gap of trust that often existed between the economic and bureaucratic nuclei. In the Petrobrás scheme, there were indeed a few cases

where intermediaries' enforcement services were required. In one case, a firm decided to detach from the cartel, acting in breach of several collusive agreements, to submit lower bid prices. One of the other cartel companies then summoned the relevant intermediary to act, with the support of the corrupt Petrobrás bureaucracy. The broker threatened the breaching company with no future invitations to tender, and the company finally conformed (Youssef, 2015). On another occasion, a bribe promise was not honoured, and the operation's intermediary was also required to correct the deal. In this case, the bribe giver resisted, and the intermediary had to cover the debt (Camargo, 2015), operating as an effective deal guarantor. In all instances, the intermediaries succeeded in ensuring the completion of exchanges. Their reliable activities brought stability to corrupt and collusive transactions that eventually became systemic, lasting for years.

However, more importantly than providing the services listed above, the intermediaries added value to the transaction, as they were responsible for the financial procedures that enabled fund transfers between two parties. In this regard, they employed a complex scheme of money laundering, for which they used mock service contracts, mock import contracts and myriad foreign bank accounts, mainly in Switzerland (Youssef, 2015).

a) The money exchange

The transaction costs relating to money transfers between transacting parties is particularly high in cases of extensive, systematic, and corrupt exchanges. Not only are the amounts significant, but also they are also frequently remitted. According to the Brazilian public prosecutors in charge of the case, until October 2016, the illegal payments amounted to USD 1.8 billion in bribes (Dallagnol and Martello, 2016). However, the Public Prosecutor's Office estimates that bribes paid in connection with the Petrobrás case might amount to USD 2.8 billion, in aggregate (Villela, 2015). One intermediary alone is deemed to have conducted as many as 3,500 operations of remitting corrupt funds abroad within three years. In aggregate, the operations carried out by this lone intermediary amounted to USD 400 million (Netto, 2016, Section: Velhos Conhecidos). Until the conclusion of this

dissertation, the Public Prosecutor's Office had identified about 15 brokers connected to corrupt deals relating to Petrobrás projects (Estadão, 2016). The origin, purpose, and beneficiaries of such payments had to be concealed by complex financial operations, and the intermediaries managed most of the necessary concealment.

The amount of money siphoned roughly corresponded to 1% of the price of the contract entered into by Petrobrás and the public works companies (Barusco, 2016). The companies expected numerous benefits from the Petrobrás officials in exchange for millionaire disbursements. Said benefits were meant to be granted over time, including bureaucrats disregarding cartel operations and providing support to overcome obstacles in infrastructure contract execution. For these reasons, *inter alia*, disbursements took place in instalments, roughly following the payment milestones of the infrastructure contracts (Skornicki, 2016).

The trust in the system of checks and balances of the corrupt network was such that the recipients remained comfortable with the gradual disbursement of illicit payments. In the case of interruption or delay, the bureaucrats could cause inconvenience to companies during contract execution. The system was so reliable, and the parties so compliant with their duties, that even after being removed from Petrobrás, the corrupt bureaucrats continued to receive bribe deposits agreed upon while they were in office (Barusco, 2016; Costa, 2015; Mendonça, 2015; Skornicki, 2016; Youssef, 2015). When asked for the reasoning behind these continued payments, an intermediary responded, "Because it was a commitment; the firms simply honoured a commitment" (Youssef).

Essentially, corrupt funds reached their final beneficiaries via: (a) cash delivery; and (b) deposit in foreign bank accounts (Barusco, 2015a; Youssef, 2015). In order to enable cash deliveries, the public works companies entered into simulated contracts with Brazilian shell companies controlled by the intermediaries. Then, the former made payments under these simulated contracts for fictitious services into the bank accounts of the shell companies. A written agreement was needed to maintain ostensible propriety in the accountancy ledger of both contracting companies. The intermediaries then withdrew cash from these accounts and

distributed it by employing cash-delivery agents (Soares, 2015). These agents used both regular and charter flights to accomplish their task. In order to enable the deposit of corrupt funds in foreign bank accounts, the intermediaries used to transfer other portions of resources deposited in the same Brazilian accounts to other shell companies controlled by them abroad. Simulated imports, for instance, were used to justify such international transfers (Youssef). The intermediaries used the layering strategy intensively to hamper the authorities' ability to trace the illicit money. Similarly, in certain cases, the bribe givers made direct payments to shell companies´ bank accounts abroad. Mock contracts between the bribe givers and foreign shell companies were signed. The intermediaries controlled these shell companies and their bank accounts. They then moved the funds to other accounts controlled by the beneficiaries (Youssef). In one engineering firm, the bribery payments had reached such an institutionalized level that it even had a bribery department (Rocha, 2016), similar to that maintained by Siemens in Germany in the 2000s, under the supervision of Reinhard Siekaczek (Schubert & Miller, 2008). This department was responsible for systematically controlling corrupt deals and the transfer of money.

Sometimes, several different foreign bank accounts, often in Swiss banks, were used to accomplish the layering strategy, to create obstacles to prevent the money being traced (Barusco, 2015a; Youssef, 2015). Ultimately, the companies deducted all those disbursements from the total corrupt amount due until they were completely compliant with the deal.

4.3. Consequences of corruption and collusion

Up to October 2016, the Brazilian public prosecutors responsible for the Car Wash investigations had detected almost USD 1.8 billion paid in bribes, and 240 individuals had been accused of committing connected offences. Among these, 110 were convicted with sanctions exceeding 1,000 years of prison in aggregate. Finally, the traced banking transactions amount to almost USD 300 billion (Dallagnol and Martello, 2016). These numbers are not final, as the investigations are still ongoing. Both the Brazilian and international communities have been stunned by such figures.

The unveiling of cases of corruption both endorses and intensifies the distrust citizens have in institutions in a given polity (Taylor, 2009). The same dissipation of trust repels other companies and organizations from making investments in the country. However, the harmful consequences of such wrongdoings start long before the case is revealed, and they last far beyond the related news leaving the media headlines.

Systems of corruption and collusion, such as that exemplified by the Petrobrás case, cause extreme costs to society. In 2014, independent auditors of Petrobrás estimated that the waste of taxpayers´ money was as high as USD 88.6 billion, comprising losses through diversion (including corruption), overpricing, improper investments, and government interference (Corrêa *et al.*, 2015). Had it not been diverted to benefit private interests, this huge sum of money could have been used elsewhere, thereby contributing to the development of the country.

The consequences of the scheme to competition, that is, the hindrances imposed to qualified bidders to prevent their participation in infrastructure projects, are two-fold. Not only did the impediments cause unquantifiable harm to competitors, including their respective stakeholders, such as shareholders and employees (Stephenson, 2016), but they also caused higher public investments to be unnecessarily employed – the so-called “overpricing." In competitive markets, lower prices are more easily achieved, thus reducing the amount of reserves channeled into projects carried out by state-owned companies. Reduced competition is also responsible for hindering technological advancement and a general loss of competitiveness in the Brazilian economy as a whole (OECD, 2008), as the incentives for the development of new technology was reduced. If a contract award is certain, competitors are better off avoiding expenditure on technological advancements targeted at efficiency gains, and the overall productivity of the country is thereby negatively affected.

Corruption and collusion also created an incentive to maintain bureaucratic inefficiency in Petrobrás. The contracting firms found bribery to be a solution to smooth their way through bureaucratic obstacles in Petrobrás because corrupt

officials provided assistance. For that reason, it is true that the perpetuation of bribery itself partially depended on maintaining these obstacles. Therefore, the self-serving officials were incentivized to oppose any attempt to streamline internal processes and procedures; this would have resulted in relationships with firms becoming either fairer or more efficient, subsequently reducing their leverage to extract payoffs (Rose-Ackerman & Palifka, 2016, IV. The costs and causes of corruption…). Public officials profited from internal inefficiency in Petrobrás and therefore had no stimulus to contribute to any improvement.

The various forms of misconduct also interfered with business planning in Petrobrás because corporate decisions might have differed had the bribes and collusion not taken place. Oversized or inadequate infrastructure projects were carried out, not for their economic benefits, but rather for the payoffs they generated (Rose-Ackerman & Palifka, 2016, II. The consequences of corruption). Although not related to oil and gas infrastructure, one example comes from the depositions of a Petrobrás bureaucrat (*Jornal Nacional*, 2016), stating that Petrobrás decided to move its entire Finance Department from Rio de Janeiro to a new building in Salvador, Bahia. The new tower cost USD 170 million and includes 22 elevators, 2,600 parking spaces, and one helipad (Pitombo, 2015). This building was commissioned from two construction firms; they allegedly made massive donations to the campaign of the governor of the State of Bahia in exchange for this project opportunity. The bureaucrat states that there was no other (licit) reason to justify such a move.

Such a complex, corrupt network operating parallel to state bodies has severe effects on governance, given that it is not subject to controls from the state apparatus, from “watch-dog” organizations, or from the media. The diversion of resources from the public coffers prevented society from receiving the respective public services to be financed; furthermore, these resources were no longer available to be monitored by state or society.

5. International cases

Brazil is not the only country that has experienced cases involving either collusion or corruption, or both, in the public works industry. The construction sector is prone to both corruption and collusion worldwide. Lord Borrie, former Director General of the Office of Fair Trading in the United Kingdom once stated that construction has the worst record of cartelization of any industry (OECD, 2010b, p.160). This statement is borne out by the fact that public works contracts and construction is the sector perceived as most likely to always pay bribes, according to the Bribery Payers Index, which gathers the views of business people from 30 countries on the likelihood of bribes being paid by companies in 19 different business sectors (Transparency International, 2011).

Although the Petrobrás case is unique in several respects, including the magnitude of illegal exchanges and the particular governance framework that the participants tried to circumvent, there are many other international instances where collusion was combined with corruption in the infrastructure construction industry. Most of the better-known instances come from the developed world: Canada, France, Hungary, Italy, Japan, the Netherlands, Spain, and the United Kingdom to list but a few. They are briefly outlined with short descriptions that are intended to provide researchers with references to cases similar to the Car Wash case.

In Quebec, Canada, a commission of inquiry that became known as the Charbonneau Commission recently investigated a high-profile collusion and corruption case. It issued its final report in 2015 and revealed a cartel of construction companies bid-rigging in major public contracts at provincial and municipal levels, as well as being involved in bribery and illegal campaign financing (Charbonneau & Lachance, 2015), which resembles the Petrobrás case in many respects. These wrongdoings lasted for about ten years. Between 2% and 3% of the value of the infrastructure contracts were siphoned into party political coffers. In this particular case, the labour unions and gangsters were also involved, which differs from the Car Wash case, according to what is known so far.

In 2000, the French press revealed the contents of the videotape left by Jean-Claude Méry, as he died. He had served as a member of the central committee of the political party *Rassemblement pour la République* (RPR). He had been in charge of collecting funds for the RPR. In these recordings, Méry described how he organized collusion between public works companies that rendered services to the City Hall in Paris in exchange for political campaign donations. These revelations even implicated Jacques Chirac, who was mayor of Paris at the time of the events. The illicit transactions took place for ten years, and the contracts won through corruption "generated 30% profit in an industry where the average is 5%" (Lambert-Mogiliansky & Sonin, 2005, p.1). This case resembles the Petrobrás case as it involves construction works and political corruption in the highest political tiers.

According to a judge responsible for a high-profile corruption trial in France, it is a rare exception for large cases of collusion in public procurement to pass without corruption in the country (Lambert-Mogiliansky & Sonin, 2005, p.1). At the beginning of 2002, the case “Les Yvelines" was judged by the *Cour d'Appel de Versaille*. This is another case of both bureaucratic and political corruption involving construction firms, where public officials both initiated and arbitrated anti-competitive activities to conveniently share maintenance and construction projects (Lambert-Mogiliansky & Sonin).

In Hungary, the road-construction sector has experienced several cases of collusion and corruption. In a highway contract worth EUR 630 million, the colluding firms agreed to designate a winning bidder, who would then subcontract the other firms after being awarded the contract. The local press suspected that swindles of this kind were directly connected to political-campaign financing (OECD, 2010a, p.25), as was also the case with Petrobrás.

The similarities between the famous *Mani Pulite* scandal and the Petrobrás case are such that Jonathan Hopkin (2014, p.66-67), when describing the Italian case, inadvertently made quite an accurate description of Petrobrás:

> So the classic mechanism was that companies gaining a contract would pay a commission, a percentage of the value of the contract, usually, to the political party or parties, which had collaborated in making the decision. Very often, this money was paid in cash, obviously secretly, without declaring it to the tax authorities and the money was used by political parties and their leaders to finance their political activities but also for personal enrichment.

The investigations were triggered in Milan in 1992. They involved six former prime ministers, hundreds of members of Parliament and several thousand bureaucrats (Vannucci, 2009, p.233). The scandal initiated several changes in Italy's political panorama, but eventually, partially due to reactionary forces, long-lasting improvements have not been perceived in the reduction of either political or bureaucratic corruption in the European country (Vannucci).

Another case where the combination of collusion and corruption was employed in the public works sector occurred in Japan. The Fair Trade Commission in Japan identified two associations of major construction companies in 2005 that were defrauding steel bridge project bids with the involvement of public officials from the Japan Highway Public Corporation (OECD, 2010b, p.161). It is one of the largest bid-rigging cases that ever took place in Japan. More than 70% of bridge projects were awarded to 47 companies, which were operating in two parallel cartels. The *quid pro quo* between the firms and the bureaucrats entailed job offers to officials after their retirement. In fact, approximately 60% of the corrupt officials were eventually appointed by one of the major public works companies (OECD, 2010a, p.25).

In 2001, a television documentary "Fiddling with Millions" (*Sjoemelen met Miljoenen*) revealed a collusion scheme in the public works market in the Netherlands. It triggered investigations by the relevant authorities, which showed how construction firms defrauded public tenders through collusion (Dorée, 2004). More than 80 individuals suspected of involvement were arrested (Dorée). Collusion is deemed to have caused overpricing varying between 8% and 15% to the majority of public construction contracts during the years 1990s (van Bergeijk,

2007, p.122). Local authorities imposed almost EUR 240 million in fines (OECD, 2010b, p.160). Contrary to the Petrobrás case, in the Netherlands, early allegations of corruption were not substantiated.

Since 2013, the Spanish authorities have unveiled instances of corruption involving illegal campaign investment by construction companies for the conservative Popular Party (*Partido Popular*; *PP*), in exchange for contract awards in the polities governed by the PP (Jiménez & Villoria, 2012, p.2). The scandal developed into two different cases: *Gurtel* and *Bárcenas*. Luiz Bárcenas was the party´s treasurer, who received and redistributed cash to party members (Plaza, 2013). Investigations were still ongoing at the time of writing. The similarities with the Petrobrás case are particularly remarkable regarding the political corruption component, which, for methodological reasons was not analyzed herein.

In one of the largest investigations in its history, the UK's Office of Fair Trading unveiled a comprehensive scheme of collusion in the construction industry in England. One hundred twelve conspirators were involved in illegal bid-rigging (OECD, 2010b, p.161) in about two-hundred tenders between 2000 and 2006, mostly employing cover-pricing methods (Office of Fair Trading, 2009), similar to the strategies of the Brazilian construction cartel.

6. Reform

Contrary to the definition set out by Amundsen (1999, p.1), corruption is not best compared to a disease. Rather, it is more directly comparable to the symptoms that are caused by a particular disease, or combination of diseases. The same holds true for collusion. The analysis of the present case implies that deficient government institutions are among the causes of the two symptoms, that is corruption and collusion, are deficient government institutions. Institutions allowed uncertainties concerning lawful economic transactions to be too numerous. In parallel, they allowed for some uncertainties concerning unlawful transactions to be reduced by the parties. The case provides evidence that the wrongdoings were responses to incentives and opportunities offered to the economic agents.

Therefore, none of these wrongdoings should be considered as stand-alone illegal exchanges. Rather, each should be taken in the context of a broader governance dysfunction (Søreide, 2014, p.246), which means they should not be understood and tackled in a vacuum.

The development of an effective plan to combat corruption and collusion starts with identifying who is transacting, why they are transacting, and what is being transacted. Essentially, corruption and collusion are undertaken by two parties: the supply side and the demand side. Because economic incentives and opportunities operate on both sides, reform should focus on at least one, or ideally both (Rose-Ackerman, 2016b). Ultimately, the purpose of such illicit conducts is the transfer of rights. Any reform attempt should start by investigating those factors.

Although the historical failure of the law-enforcement apparatus may have played a role in the organization of offences, the case study implies the combination of a flawed set of institutions that were not conducive to wider social benefit.

Initiatives to deter such wrongdoings should be implemented on multiple fronts, in parallel. Efficient law-enforcement certainly constitutes one of these fronts. The increase in the probability of being reported, investigated, and sanctioned is an effective deterrent to wrongdoing (Becker, 1974). It is undeniable that the

organization of the system of collusion and corruption that engulfed Petrobrás for years is a consequence, *inter alia*, of the historical impunity in Brazil and the subsequent generalized belief that the law enforcement-apparatus would never reach the offenders. In fact, no major case of bureaucratic corruption involving larger public works companies had been successfully investigated and sanctioned in Brazil until the Car Wash operation. Essential reforms in the fight against these types of offences include both a criminal justice system that imposes liability, and enforcement methods that actually increase the capture rate (Robinson & Darley, 2004). Polities should create environments where offenders perceive the chances of being caught and sanctioned as high. Moreover, the penalties should be sufficiently harsh to act as a deterrent. “The deterrence of criminal behaviour depends on the probability of detection and punishment, and on the penalties imposed” (Rose-Ackerman, 2010, p.10).

In any event, law-enforcement is only one of the initiatives possible in the fight against corruption and collusion. The emphasis on law enforcement, without other parallel preventive measures to discourage such misconduct, might not result in any extended, long-term social benefit. That is so because the incentives and opportunities to act against the law might remain untouched, and wrongdoings might therefore occur again. It is also the case that enforcement itself can sometimes be quite detrimental to the overall economy. Some of the recent massive losses of public works firms can be attributed to their involvement in the Car Wash trial, and some of them are verging on bankruptcy. The risk of debarment from public bids caused the downgrading of their risk ratings, making it difficult to access credit in the financial market, resulting in consequent disinvestments (*O Globo*, 2015). A cascade effect in the whole market took place; unemployment in the sector is rampant (Bôas and Pamplona, 2016), and the completion of infrastructure projects is at risk. Therefore, preventive reforms, mainly concerning the incentives and opportunities for such offences, should be the object of close attention. In such an exercise, institutions and transaction costs are important tools of change.

In principle, if corruption is successfully combated alone, in a context where both forms of wrongdoing take place, there may not be an overall social benefit, as it

will only make bid-rigging more lucrative to companies as the expense of making illicit payments would be eliminated (Rose-Ackerman & Palifka, 2016, C. Nodes of corruption). The clique of companies would only force the public administration to pay for overpricing in the absence of a qualified alternative competitor. Conversely, if only collusion is effectively prevented, in a context where corruption is also prevalent, due to the asymmetric distribution of information, corrupt officials could then extract higher payoffs from companies, which would not be able to communicate and coordinate to counter this opportunism. The price of public projects would increase accordingly to accommodate larger illicit payments.

In any case, combating corruption or collusion separately remains a second-rate option. Despite the instability to the system that the isolated elimination of one of the forms of misconduct could cause, they should be tackled systematically and simultaneously (Lambert-Mogiliansky & Sonin, 2005; OECD, 2010a; Rose-Ackerman & Palifka, 2016).

Anti-corruption and competition policymakers should act in concert and take advantage of the reciprocal effects that their actions can create. The fight against corruption can cause an increase in transaction costs of the collusive dealings, thereby making them less stable. Once corruption is controlled, government officials lose the incentive to: (i) deter the entrance of new firms; (ii) disclose confidential information to bidders that is useful to cartel deliberations; and (iii) spare firms from anti-competitive measures, even encouraging defection from the cartel. Ultimately, removing these incentives might significantly affect the organization of collusion. Moreover, once corruption is controlled, colluding firms stop relying upon assistance from the bureaucracy to deter defection from the cartel.

Likewise, attacks on collusion by policymakers could increase the transaction costs that affect corrupt exchanges. The creation of conditions conducive to a more competitive market could attract more efficient firms that may not accept the requirement to pay bribes and that are willing to fight for projects legitimately, thereby challenging government decisions that may be biased by corruption. In this way, stronger competition may destabilize corrupt transactions.

In parallel to initiatives to adjust incentives and opportunities concerning wrongdoing, it is essential that reformers correct the failures of legal institutions to incentivize legal dealings. Therefore, to achieve long-term effects, the relationship between the private and the public sectors should be streamlined to mitigate uncertainties wherever possible and to become advantageous to society's interests. As long as the overall costs of concluding a deal within a legal governance framework remain higher than those incurred through corruption and collusion, reform attempts will have little chance of success.

6.1. Patronage system

The patronage system in state-owned companies is an essential cog in the machine of corruption. In the Petrobrás example, the incumbent coalition was given the prerogative to appoint company executives. The federal executive branch grants posts for political parties to populate according to their agendas as a reward for having supported the winning presidential candidate. The incumbent coalition benefited from corruption as businesses made massive campaign donations in exchange for being selected by Petrobrás to execute infrastructure projects. In such a scenario, one facet of reform should be initiated with regard to the executive's selection.

The selection of officers in SOEs in Brazil, as in many other polities, is not merit based, but rather a simple distribution of spoils. The support from inside an SOE by its executives not only enables politicians to amass campaign donations, but also warrants the *quid pro quo* for public works companies. Therefore, initiatives that disrupt the simple distribution of the spoils system can cause the desired instability in the demand side of bribery. There is a combination of four possibilities of reform in that regard: (i) selection of high-ranking bureaucrats by a collegiate body; (ii) meritocratic selection; and (iii) interdiction of politicians in high-ranking bureaucratic posts.

The appointment of bureaucrats should require transparent deliberation by a group of stakeholders in the state-owned company, such as minority shareholders,

employees, civil society, and so on. Such a change should not imply that political agents (executive and legislative branches) would not have a voice in the approval of such executives. The government is ultimately a majority shareholder in SOEs; therefore, its interests should also be met. Such an initiative should increase the transaction costs of corruption faced by politicians as they lose control of the bureaucracy, which is essential to prevent corrupt dealings.

The risk of corruption is significantly lower when bureaucrats' careers are not dependent on political connections (Charron *et al.*, 2015). Officials chosen by politicians are often expected to pay back such appointment, often in illegal ways. The meritocratic selection of bureaucrats tends to disrupt the influence of politicians on the public administration. It also helps prevent the use of the government administration in exchanges between businesses and political agents. Finally, it brings efficiency to the bureaucracy.

Moreover, it is important to prohibit the appointment of individuals who previously held seats in political parties, or government. Such a measure is likely to encounter resistance in the political milieu, as these appointments are often regarded as a way to populate SOEs with market executives, orienting the administration of SOEs toward market interests, rather than the public interest. As far as corruption is concerned, if a candidate's merits are compatible with the post, and if the candidate is approved by the majority of stakeholders, then the risk is reduced. Again, with this reform, the transaction costs faced by corrupt politicians would be magnified.

Finally, the rotation of executives should also comprise part of the reforms to disrupt the patronage system. The repetition and development of relationships of trust are essential to corrupt dealings, as they significantly reduce several of its transaction costs. If an executive holds office for a shorter period, the bribery system will be jeopardized with every change of the incumbent bureaucrat, and the opportunity to consolidate such relationships will be reduced (Lambsdorff, 2009). Thus, the costs of transacting unlawfully become higher for the firms involved.

Ultimately, the four measures above aim to build trust between SOE stakeholders and its management, while disrupting the relationship of trust between the bureaucracy and other parties in a corrupt deal.

6.2. Procurement processes in state-owned enterprises

Reforms should also concentrate on the way that SOEs organize their bids and manage the execution of projects. Such reforms should have an ultimate goal of reducing particular uncertainties and transaction costs experienced by licit companies, while also increasing uncertainties and transaction costs faced by wrongdoers. Consequently, competition should be augmented, and opportunities and incentives for corruption and collusion should be reduced.

There are, however, particular uncertainties that reformers should not reduce because their existence is compatible with society's interests. Uncertainties faced by competitors in a market, as to whether they will win a project contract or not, are desirable, and should be augmented as much as possible by reformers. The policy proposals made here target uncertainties that are not in the government´s best interest to maintain.

With regard to the bidding process, while several changes could be implemented, three are highlighted here. The first change targets corruption, and the second and third target collusion. The SOE should: (i) develop detailed project planning prior to project tendering; (ii) eliminate the requirement to award contracts to the lowest conforming bidder; and (iii) introduce the possibility of a competitor to take over projects awarded to colluding companies.

First, the fact that contracting companies base their proposals on a basic engineering design, where the details of complex projects are not yet developed creates instability that encourages corruption. Prior to the relevant tender, the detailed design of an infrastructure project should be prepared, describing comprehensively the characteristics of the site, the technical details, materials to be employed, and so on (Lupion, 2016). Illicit payments were a way of ensuring

that contracting companies could rely upon cooperation from bureaucrats should unforeseeable problems materialize. The more accurately a project is described prior to the tender phase, the less room is left for renegotiations and contingencies during contract execution; therefore, the less the winning company will depend upon the cooperation of bureaucrats, including self-serving officials. Such measures would attract those competitors who rejected Petrobrás for their rather conservative risk tolerance, and it would also reduce the incentive to bribe as the bureaucrats would be left with less bargaining leverage.

Second, international agencies deem the requirement that bids should be assessed solely by price an efficient strategy to reduce the discretion of public officials and, therefore, corruption (Wells, 2014, p.26). However, such a requirement actually fosters collusion as it results in foresight of the tender committee's decision, making it simpler for colluding parties to achieve price agreement (Charbonneau & Lachance, 2015, Volume 3, p.26). If such a requirement is abolished, transaction costs for the bidding firms are magnified, bringing instability to cartel deliberations. A possibly excessive discretion granted to public officials, which is an issue of concern to international agencies, should be tackled otherwise. One method of reform might be to introduce the "four-eyes method", according to which another public official rechecks a peer's strategic decisions (Lambsdorff, 2009, p.392).

Third, incentives should be created for licit firms to report colluding competitors. A possible mechanism would allow a qualified company to identify a project awarded through collusion and report on it in exchange for taking over the relevant project (Sundfeld, 2016). The licit firm would exercise such entitlement after the contract award, and it would then be allowed to take over the respective project for a price lower than that of the colluding winner. The discount on the price should be predetermined, for instance, at 5%. Such a discount would correspond roughly to the price excess of the winning proposal. This reform would benefit licit competitors and could even be extended to other colluding competitors not awarded the contract. In the latter option, even if the reporting company had participated in cartel negotiations, it should not be sanctioned. Such an incentive would enhance the possibility of cheating between competitors, thereby creating

further instability in such illicit agreements. Given that discussions of this type will always entail suspicion that one participant might gain future advantage from reporting that collusion, it will thereby augment relevant transaction costs. Furthermore, the resulting price discount clearly meets the public interest.

6.3. Managing execution of public infrastructure contracts

With regard to managing project implementation, there are also several applicable improvements, but only one will be highlighted here: simplifying SOE contract management rules. As demonstrated in the Petrobrás example, bribes were also paid to encourage corrupt bureaucrats to ensure smooth operations for companies during the contract-execution phase. Should those rules become simpler and more transparent, the opportunities for officials to extract bribes would be reduced because contracting companies would not need bureaucratic cooperation to ensure their entitlements are respected. To wit, several uncertainties would be diminished; likewise, transaction costs of the execution phase of the infrastructure project. For example, the price payment delay or suspension should follow clear rules. In the absence of reasons to justify such a delay or suspension, the responsible official should be administratively punished. Such a measure would reduce corruption and increase the attractiveness of SOE projects to licit companies.

6.4. Transparency

Transparency is a controversial issue when it comes to combating collusion and corruption. It can provide bidders with commercially sensitive information that can facilitate market understanding, which leads to bid-rigging. In any case, OECD (2007, p.29) recommends that initiatives should balance “transparency and its contribution to corruption control with other considerations such as efficiency”.

Here, transparency is understood to mean the equal disclosure of information to all stakeholders to eliminate its asymmetric distribution. Information about the long-term plans of projects, process rules, and decision-making methods are essential

to enable competitors, monitoring and enforcing authorities, the media, and wider society to scrutinize procurement processes.

Transparency concerning process rules and decision-making methods can allow stakeholders not directly connected to transactions to inspect them. Utilizing technological tools can provide access to social organizations, universities, independent auditors, and citizens in general, thereby offering the opportunity to oversee whether the relevant rules were correctly followed and whether decisions were made impartially (Rose-Ackerman, 2016a). Such transparency increases the risk of corrupt dealings being detected and may help advance knowledge about corruption. More importantly, however, it can increase the transaction costs of corruption if suspicious activities can be detected during the time that elapses from the payment of a bribe and the performance of the corresponding return.

Bribes are often paid to obtain access to privileged information, which is an essential part of trying to reduce the transaction costs in legal dealings. If the information is widespread, licit firms are granted the same conditions to compete. Moreover, the disclosure of information by the government can reduce the uncertainties of dealings with the companies. Transparency mitigates the incentives to bribe in exchange for information. The decision-making process of firms then becomes less doubtful.

Where information is asymmetrically distributed, parties can opportunistically take advantage of others. One competitor holding confidential information about a bid is in a better position to be awarded a contract than others. Similarly, a public official who holds back information unnecessarily is in an advantaged position to demand illicit payments in exchange for disclosure.

In environments where collusion and corruption coexist, disclosure of information should be balanced to avoid facilitating collusive dealings. The needless disclosure of commercially relevant information can make the procurement process excessively predictable, enabling firms to better organize their bid-rigging activities. However, there are still doubts as to what information can ease collusion, so further research on the topic is needed (OECD, 2010a).

6.5. Whistle-blower protection

Effective whistle-blower protection mechanisms are likely to deter both collusion and corruption. Governments should create hotlines to collect reports from whistle-blowers, and it should be possible to use these lines anonymously. In any case, reporters should be able to rely on the state apparatus to guarantee protection from retaliation. In addition, and more importantly, in cases where whistle-blowers are among the perpetrators, they should be granted immunity (or a significant sanction rebate) if their contributions are of value.

Encouraging whistle-blowers to come forward and report on wrongdoing enables law-enforcement authorities to investigate and punish offences. In addition, such mechanisms, when functioning properly, can discourage *ex ante* collusion and corruption. The awareness of such a system brings instability to both collusive and corrupt dealings, raising their respective transaction costs. One party could reasonably fear that a counter-party is a potential whistle-blower, who would not face significant consequences in the event of denunciation. Ensuring that the counter-party (or anyone else, for that matter) will remain silent significantly augments transaction costs. The less a whistle-blower has to lose, the more the uncertainties in corrupt or collusive exchanges increase.

In conclusion, reform should target collusion and corruption at the same time to prevent wrongdoers, on various fronts, from seeking alternative illegal institutional changes. Reformers should aim to augment particular uncertainties and transaction costs for collusive and corrupt exchanges, while reducing specific uncertainties and transaction costs in licit agreements.

7. Conclusion

The present case study investigated the collusion scheme involving public works firms and the bureaucratic corruption surrounding the procurement processes of Petrobrás, the Brazilian state-owned oil giant, from 2004 to 2014. The study compared the arrangements of transactions by the same economic agents in both a legal and a posterior illegal institutional framework. The present research was only possible due to the availability of video-recorded court depositions of individuals that participated in the dealings, and a wealth of press material and documented court proceedings concerning the case. Such sources enabled an observation of the inner functioning of the exchanges.

With regard to limitations of the research, in addition to the researcher's subjectivity, the fact that the depositions were made in a court of law by individuals with particular defence interests is a potential limitation with this type of source. Moreover, at the time of writing, investigations had not been concluded, so future discoveries may alter the interpretation of the functioning of the institutions, as they are known so far.

Uncertainties generate transaction costs. Transaction costs affect analysis of the cost–benefit ratio conducted by economic agents. The investigation of the arrangement of different transactions revealed that failed government institutions caused particular uncertainties (*i.e*., transaction costs) in lawful dealings to be high enough to make deals appear unpayable to economic agents. At the same time, government institutions were incapable of augmenting particular uncertainties (*i.e.,* transaction costs) in illegal dealings that would have made such dealings less attractive. The Petrobrás case study is an instance where illegal dealings were relatively more advantageous to the economic actors.

The transaction cost analysis provides a useful tool for reformers in identifying opportunities and incentives surrounding economic exchanges. Transaction costs make markets imperfect in various ways. Many of such imperfections are undesirable to the society at large.

Petrobrás procurement concerned mega-infrastructure projects in the oil and gas industry. The transaction costs analyzed by the present study, which affected *lawful* dealings between contracting firms and Petrobrás, resulted from the following factors: (i) a highly competitive market between public works companies; (ii) lack of institutional trust; (iii) difficulties determining cost, duration, and technical aspects of projects; (iv) excessive red tape in the Petrobrás bureaucracy; and (v) the legal proceedings necessary to protect transacting parties´ rights. Except for competition in the public works market, which should be preserved, the other aspects should be revised and reformed by policymakers.

Such transaction costs jeopardized the utility-maximization purposes of both the firms and the corrupt officials in Petrobrás. To avoid these costs, the parties then implemented institutional changes based on a combination of private collusion and bureaucratic corruption. However, these unlawful dealings were not immune to particular transaction costs.

Several transaction costs for *unlawful* dealings, namely collusion and corruption, concerned: (i) the difficulties of transferring information, mainly regarding the trustworthiness of partners, and the exact terms and conditions of illicit deals; (ii) the problematic enforcement of the deals; and (iii) the risks of transferring illicit money.

The wrongdoers had to find ways to mitigate such transaction costs. A subsidiary finding of the case study concerns the complementarity of private collusion and bureaucratic corruption. They were mutually useful for reducing some transaction costs, so collusion was responsible for mitigating some of the transaction costs of corruption and vice versa.

For its part, collusion enabled both the exchange of information among the colluding firms and the establishment of mutual relationships of trust; therefore, the firms could unite against public officials' latent opportunism, as they could occasionally decide to renege on the corrupt deals. Collusion was also useful for corrupt bureaucrats, as they could then simply replicate deals previously accepted

by other colluding firms, and could refer to the cartel in a case of defection of one of its members.

For its part, corruption was employed, *inter alia*, to ensure cooperation by self-serving public officials with cartel operations. Bureaucratic corruption was useful for reducing several transaction costs of collusion, such as those concerning: (i) maintenance of market size; (ii) possible initiatives against the cartel by Petrobrás; (iii) access to privileged information to help cartel deliberations; and (iv) enforcement of cartel decisions.

In addition to other measures taken by offenders (namely, firms and bureaucrats) to control the transaction costs of illegal dealings, they largely employed financial intermediaries, who assisted the parties to access both confidential information and strategic counterparties, to enforce illicit deals, and, more importantly, to secure the transfer of illicit money between transacting parties.

Such illegal dealings had severe adverse impacts on Brazil, including wasting public resources, damaging competition, and providing incentives to maintain excessive bureaucracy within Petrobrás, to name but a few.

Reforms to fight both collusion in public procurement and corruption often focus on law-enforcement initiatives. This type of initiatives correctly targets the increase of the cost of such offences. However, law-enforcement initiatives are not enough to effectively counter either collusion in public procurement or corruption. Multiple preventive reforms should also be implemented. They should aim at decreasing the cost of legal dealings and at increasing the cost of illegal dealings. Preventive reforms promise longer-lasting effects against such misconducts. Moreover, collusion and corruption should be tackled simultaneously, on multiple fronts.

Therefore, reforms should correct institutions in order to curb misconduct such as collusion and corruption. Reforms should increase the transaction costs of illegal dealings and decrease those of legal dealings. Desirable initiatives may include: reducing excessive bureaucracy in SOEs; decreasing technical uncertainties in infrastructure projects before bids take place; ensuring symmetric distribution of

information among bidders; and opening procurement information to scrutiny by wider society.

8. Endnotes

1. Abramo (2004) developed a survey about corruption as perceived by entrepreneurs in Brazil.

2. This arrangement is similar to one described by Rose-Ackerman & Palifka (2016, B. Lessons for developing countries), citing Mamiya and Gray, which took place in Japan. Here, public officials helped maintain the operation of a cartel through manipulating a list of qualified companies in capital-intensive public works.

3. It is not clear at this point of the Car Wash investigations whether the highest-ranking executives of Petrobrás involved in the approvals, over and above the corrupt officials, were aware of the whole swindle.

4. The larger companies became attracted to Petrobrás tenders only when it started making massive investments in infrastructure, approximately between 2004 and 2014.

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