A study of corruption using the Institutional Analysis and Development framework with an application to the bidding phase of infrastructure procurement

Olga Binions

University College London

Thesis submitted for the degree of Doctor of Philosophy

in Civil Engineering

2018

Declaration

I, Olga Binions, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

Infrastructure projects are particularly vulnerable to corruption due to the complexity of processes and relationships between private and public entities, and the large-value contracts involved. Corrupt agreements can affect any phase of an infrastructure project, and the outcomes include reduced competition, poor-quality construction or infrastructure that does not meet value-for-money criteria. This PhD thesis brings together insights from economics, sociology and psychology to develop a broad framework of corruption with the focus on individuals, their actions and the settings in which corruption occurs. This framework is then applied to the bidding phase of physical infrastructure procurement. The method used to consolidate and analyse disparate theories and models of corruption across different disciplines is Elinor Ostrom's Institutional Analysis and Development framework. Key variables of the corruption phenomenon are identified and organised using the IAD framework, and two models are developed. The first is a game-theoretic model analysing the importance of social networks and trust between corrupt partners and the intermediaries who facilitate corrupt exchanges. The second is a simulation model of decision-making processes in corrupt agreements based on a conflict of social norms and individual self-interest. The second model proposes a method of linking legitimacy of institutions, group behaviour status quo, and social network connections, with self-seeking behaviour. Case studies are then developed based on documents filed to support prosecutions under the US Foreign Corrupt Practices Act 1977. The proposed methods of corruption reduction are based on organisational controls and collective-action methods.

Impact statement

This thesis offers a number of insights that can inform public policy design. These insights are mainly aimed for public policy makers designing methods of preventing corrupt practices in infrastructure procurement, but can also inform companies developing internal systems aimed at detecting and preventing corrupt practices. Collective action in reducing corrupt practices, with more robust anti-corruption systems in both public organisations and private infrastructure delivery companies, can improve trust between the parties. The insights offered in this thesis are applicable globally and the long-term impact of the thesis can manifest itself in improved competition in the infrastructure market, fairer practices and increased value-for-money of infrastructure services.

Corruption in infrastructure projects bidding processes tends to be grand in nature and often involves politicians, multiple institutions and government organisations. Therefore, for anti-corruption measures to be effective, they may require re-designs of multiple institutions including political organisations. A culture change towards fair competitive practices is required for anti-corruption measures to be successful, and this process can only happen gradually. Institutional changes need to be accompanied by the development of social norms supporting the new systems aimed at reducing corruption.

The thesis showed how institutional processes of detecting and preventing corruption that have been put in place in infrastructure delivery companies can be ignored and circumvented. For these processes to be effective, they must be perceived as legitimate and right by those expected to apply them. The processes need to be consistent with the wider organisational culture, developed impartially and need to allow the appropriate level of discretion in rule application.

The models developed in the thesis will benefit future academic research. In particular, the novel method of analysing social norm conflict and its resolution proposed in a social simulation model offers a method of linking legitimacy of institutions, group

behaviour status quo, and social network connections with self-seeking behaviour. This method can be applied to other research questions where behaviour is driven by multiple factors, including social norms, as well as monetary payoffs considerations. The model can be adapted to study social norm conflicts which involve breaking rules and where social connections play an important role in decision making.

A paper with an early version of the model analysing social norm conflict was submitted for peer review and consideration for presentation at the Social Simulation Conference 2015 (Groningen, Netherlands, September 2015). The work was allocated a poster presentation and was awarded Best Student Poster.

The model presented in this thesis discussing strategies used by the corrupt to establish a successful corrupt agreement was presented to an international audience of academic researchers and social network analysis practitioners (Sunbelt XXXV, June 2015, International Network for Social Network Analysis).

Contents

Figures

Tables

1 Introduction

1.1 Overview of the problem

Despite views that corruption is mostly a problem of developing nations, some developed countries also face issues of endemic corruption (Bicchieri and Duffy, 1997, Brandt and Svendsen, 2013). Corruption has been shown to cause numerous negative economic impacts through, for example, reducing expenditure on health and education (Mauro, 1998), its contribution to poverty and inequality (Gupta et al., 2002) and by reducing private investment (Mauro, 1995).

Corruption in infrastructure projects can have particularly damaging impacts on the economy and even disastrous consequences for the population. Financial losses due to corruption in the infrastructure sector vary widely, and have been estimated to range between 5% and 20% of construction costs (Wells, 2015). However, economic costs of corruption can exceed financial costs because corruption can skew spending priorities and result in substandard quality of infrastructure that is costly to maintain (Kenny, 2006).

Projects can be chosen based on the potential for bribe extraction rather than according to national priorities. For example, new infrastructure projects tend to be more lucrative than maintenance projects and, therefore, are preferred by corrupt governments looking to extract bribes. This diverts funding away from maintenance of existing infrastructure and presents risks for public finance and distorts the allocation of resources (Tanzi, 1998b). The result are 'white elephant' projects, with little or no social benefit, and excess capacity (e.g. electrical distribution system with capacity in excess of projected demands, creating redundancies) (Wells, 2015). The objective of delivering value-for-money infrastructure is, therefore, undermined.

Corruption in construction can exacerbate or even cause earthquake-precipitated disasters (Green, 2005) through lack of adequate engineering, industry inspection or

quality assurance (Olson et al., 1999). Inferior materials, methods of construction, or lower quality contractors are sometimes used to increase profits from projects (Olken, 2009, Sohail and Cavill, 2008). Structural components are often concealed (e.g. roof structures are concealed by cladding), and this creates reliance on supervising engineers to certify that earlier work was carried out according to standards. Bribery of supervising engineers to certify substandard work can lead to dangerous structures. In regions prone to natural disasters, the outcome is construction that creates higher risks of predictable loss of lives (Green, 2005, Alexander, 2005).

1.2 Vulnerability of infrastructure projects to corruption

The Transparency International's 2011 Bribe Payers Index, which reflects the perceived likelihood of companies from different sectors to pay bribes, shows that companies involved in public works contracts and construction are thought to be most prone to engage in corruption (Transparency International, 2011). Developed countries, where the general corruption levels are perceived to be lower compared to transition or developing countries, are not immune to corruption in the construction industry. The CIOB survey (The Chartered Institute of Building, 2013) reports that 43% of respondents believe all stages of construction projects in the UK to be prone to corruption.

Infrastructure construction projects are particularly vulnerable to corruption. A number of factors, relating to industry-specific characteristics, and the types of projects and parties involved, have been identified to explain this vulnerability (Stansbury, 2005, Hawkins, 2013). In particular, projects are created infrequently and at irregular intervals. For companies in the infrastructure sector, winning a project can become critical for a company's continued viability, creating strong incentives to bribe the relevant decision-makers. The costs of bribes are generally not borne by the bribe-paying companies, but are passed along to the entities financing the projects (usually the taxpayer) through inflated bids, or through reduced quality or quantity of materials used (Tanzi and Davoodi, 1998). Other reasons behind the particular vulnerability of the sector are limitations on competition (Zanella, 2013) and the general lack of

transparency in construction projects' development and execution procedures (WEF, 2013).

Infrastructure projects tend to be large and high in value, and each project is unique, with costs usually hard to benchmark based on comparisons with other projects. This makes it easier to hide large bribes. Each project involves a large number of organisations, including contractors and subcontractors, consultants carrying out feasibility studies, environmental impact assessments and designs, governmental departments and officials approving the projects and issuing the necessary permits, and supervising engineers certifying the quality of work. Each contract, approval or certification process can be affected by corruption. The number of project phases and the complexity of systems involved make it difficult to establish systems of oversight to prevent corruption.

1.3 Aims of this thesis

As discussed above, corruption in infrastructure projects can have damaging consequences, ranging from negative economic impacts, to safety risks for the population. The high-level incentives for infrastructure companies to engage in corruption are perhaps intuitive: to gain projects in an unpredictable and high-stakes sector, and to increase profits from these projects. The motivations underpinning the choices of public officials in this context are less clear-cut. For example, it is not clear whether officials awarding projects to the less competent companies in exchange for bribes take into account the potential repercussions of their actions.

Similarly, little information is available in the public domain about how corrupt agreements are established. One reason for this is the clandestine nature of corruption. The problem is compounded in the context of infrastructure projects by the particular lack of transparency in the sector (WEF, 2013).

Developing a better general understanding of how decisions leading to corrupt agreements are made can help for the development of new methods of corruption prevention. For example, knowing how individuals connect and negotiate a bribe can

help in the detection of corruption. Corruption as a phenomenon has a few characteristics that are most commonly recognised and associated with the term. For example, bribes, corrupt officials and companies looking to cut expenditure through reduced quality of materials are a few of the characteristics that come to mind in association with the above examples. The first aim of this thesis is to develop a broad concept of corruption within which different factors and characteristics commonly associated with corruption are gathered and linked. The purpose is to provide a broader view of what corruption means and how individuals make decisions leading to corruption.

Of course, the choices of individuals and the way the corrupt operate can be context-specific. It is, therefore, important to bear in mind the setting to understand how specific circumstances frame corrupt agreements, and what additional factors are crucial in such environments. The second aim of this thesis, therefore, is to use the developed broad concept of corruption in application to the infrastructure sector.

It is prudent to establish at the outset what is meant by infrastructure in this thesis, and what specific activities are focused on. There is no single definition of infrastructure that encompasses all uses of the term (Buhr, 2003). For example, the UK's National Infrastructure Commission sets out sectors of economic infrastructure as energy, transport, water and wastewater, waste, flood risk management and digital communications (HM Treasury, 2017). According to Nijkamp (2000), infrastructure can mean either material public capital such as roads, bridges and energy grids, or immaterial public capital such as culture, education and communications. It can also include data, as well as different types of facilities (material, institutional and personal) available to economic agents (Jochimsen, 1966).

In this thesis, the term infrastructure is used in the narrow meaning of material or capital goods. Specifically, infrastructure projects in this thesis mean the delivery or construction of the capital goods that enable or support services, in the way that rail tracks and tunnels support transportation services, telephone exchanges support telecommunications, and transmission and distribution lines support power services (Prud'homme, 2004).

The reason behind the choice for the narrow meaning of infrastructure is to bring the focus on the specific activities related to large construction projects thought to be particularly vulnerable to corruption (Transparency International, 2011, The Chartered Institute of Building, 2013). This meaning of infrastructure is also compatible with the Institution of Civil Engineers' definition, namely "the physical assets underpinning the UK's networks for transport, energy generation and distribution, electronic communications, solid waste management, water distribution and waste water treatment" (Rhodes, 2015).

Infrastructure projects delivering such physical assets often take several years to complete, and involve multiple phases, including preparation and planning, financing, tendering and construction, followed by operation and maintenance. Each of these phases can be affected by corruption in a different way. The use of inferior materials and methods at the point of construction can be accompanied by payoffs to the supervising and certifying engineers to approve the work. At the earlier phases of the project, a company intending to bid for it would be interested in the project's initiation and could stand to gain if the project is allocated a larger budget. Therefore, the company may attempt to use corrupt methods to achieve these objectives. The way corruption manifests itself can be very different in each of the above scenarios, and the individuals and the level of decision-making involved would vary. Therefore, in developing a broad concept for the study of corruption, bearing in mind a specific type of activity it is developed for would help in focusing the purpose of the work.

Corruption during the earlier phases of an infrastructure project may lead to corruption later in the project cycle (Wells, 2015). For example, a company may look to recoup the amounts spent in bribes through reduced quality of materials, followed by payoffs to the certifying engineers. On the other hand, if a company engages in corruption before being awarded the contract, it can become even more crucial for this company to win the contract. Otherwise, the earlier expenditure in bribes is not justified. Corruption at the tendering phase of infrastructure projects, therefore, can explain corruption in earlier or later phases. During the tendering phase, a company might also engage in corruption for a number of reasons. It might attempt to manipulate the

tender processes in its favour, to gain access to the information contained in another company's bid, or to pass the pre-qualification criteria (GIACC, 2008).

Therefore, the bidding or tendering phase of an infrastructure project is a particularly crucial stage for infrastructure delivery companies. As noted above, winning a contract can determine the company's viability in an uncertain market with infrequent and irregular project initiations. Corruption at earlier and later phases can also be the result of, or the reason for corruption at the tendering phase. Therefore, the tendering phase of infrastructure projects will be the focus in this thesis.

1.4   Summary and structure of the thesis

To summarise, the overall aims of this thesis are to develop a broad concept of what corruption means and how individuals make decisions leading to corruption, and to apply this concept to the tendering phase of infrastructure projects, to offer insights into potential methods of corruption reduction in this sector.

Chapter 2 of this thesis reviews past literature on the topic of corruption, with the focus on the definitions, types, theories and models of corruption, and the proposed methods of corruption reduction. Based on this review, Chapter 3 then refines the overall aims of this thesis and sets out the research questions and the methods used to tackle them.

Chapter 4 explains the key method used in this thesis and develops a broad general concept of corruption, incorporating the different factors and characteristics of corruption identified in past literature in Chapter 2, and links these factors together. Based on this general concept, two models are developed, to analyse decision-making processes of bribe-givers (Chapter 5) and bribe-takers (Chapter 6).

Case studies of corruption in infrastructure projects are developed in Chapter 7 based on the documents filed in support of prosecutions under the US Foreign Corrupt Practices Act 1977. This chapter also applies the general concept developed in

Chapter 4 to these specific cases of corruption. Several proposals for corruption reduction in the tendering phases of infrastructure projects are then offered.

Chapter 8 evaluates the contributions of this thesis and Chapter 9 concludes.

2 Literature review

2.1 Introduction

Various measures to reduce corruption have been offered by anti-corruption scholars and practitioners: increased sanctions against corrupt individuals or organisations; improved accountability in public spending; decentralisation and privatisation, to name a few. The proposed packages of anti-corruption measures depend on what the root causes of the problem are theorised to be. These theorised causes range from complicated bureaucracies with inefficient institutions, to certain societal cultural backgrounds, to simple greed and opportunism.

What is sometimes overlooked is that corruption takes many different forms, each with its own causes (De Graaf, 2007, Ashforth et al., 2008, Hodgson and Jiang, 2007, Boehm and Lambsdorff, 2009). Corruption-reducing solutions, therefore, need to be developed based on the type of corruption under consideration, and need to address the causes underlying this precise type. For example, if corrupt behaviour is sporadic, caused by individual characteristics such as greed, it is logical to battle corruption at micro level, dealing with individual instances of corruption through the system of monitoring and punishment. If, on the other hand, corrupt behaviour is thought to be the product of the environment, stemming from the organisational or societal culture, norms or values, solutions that tackle individual behaviour would only deal with the outcomes, leaving the actual causes intact. Examples of measures that may be more appropriate in this case are establishment of organisational controls, training, and awareness campaigns.

It is, therefore, necessary to first assess the type of corruption being tackled, and ascertain whether corruption is unorganised and opportunistic, or whether there are deeper causes and complex structures guiding individual behaviour. Similarly, reforming entire organisations or systems that are not corrupt overall is unnecessary if corruption originates in a small group of individuals, who identified and took

advantage of opportunities for self-enrichment, without spreading the culture of corruption through the system.

This chapter provides an overview of literature on the topic of corruption. First, it discusses what is understood by the term 'corruption' (Section 2.2) by reviewing its definitions (Section 2.2.1) and the commonly identified types and manifestations (Section 2.2.2). Second, it sets out and categorises theories and models of corruption (Section 2.3) according to the level of analysis used: macro-, micro- or meso-level. Third, measures of corruption reduction that follow from these theories and models are evaluated (Section 2.4), and Section 2.5 concludes.

2.2   What is corruption?

2.2.1   Corruption definitions

Publications on the topic of corruption often start with providing a definition of corruption. Literature containing critiques of definitions has burgeoned in the past 20 years, yet a single definition has not been agreed upon. Although corruption can also be thought of as a state and a process (Ashforth et al., 2008), the focus here is on what is understood by corruption as actions or behaviour. The definitions discussed in this section are numbered and listed in Appendix A.

One of the most widely-cited definitions is "the abuse of public office for private gain" [1] (World Bank, 1997). Hodgson and Jiang (2007), Thompson (2013) and Begovic (2005), among others, have set out three main contentions with this definition. First, it confines the setting to public office, whereas corruption can occur in the private sector without the involvement of public officials (Hodgson and Jiang, 2007). Indeed, through the process of privatisation and development of public-private partnerships, the distinction between the public and the private spheres has blurred, with some responsibilities delegated by public institutions to private companies (Kurer, 2005). Accordingly, the Organisation for Economic Co-operation and Development (OECD) extends the setting to both public and private offices [5] (OECD, 2008). Transparency International addresses this issue by focusing on the abuse of "entrusted power" [2]

(Transparency International, 2009) rather than narrowing the scope to any specific setting or sphere.

The second contention with definition [1] above is that it defines corruption as being driven by private gains. Gains from corruption, however, are not only diverted to private individuals, but can manifest themselves as benefits for entire organisations, including political parties (Thompson, 2013). The Norwegian Agency for Development Cooperation (Norad) shifts the emphasis from who gains, to how these gains are obtained, referring to "illicit gain" [3] (Disch et al., 2009). Likewise, the definition used by Bicchieri and Duffy (1997) centres around breaches of legal norms of behaviour, conceptualising corruption as "the illegitimate use of public roles and resources for private benefit, where 'private' often refers to large groups such as political parties" [8].

Third, the term "abuse" in definition [1] is broad and can include other misconduct, such as embezzlement that may not be commonly understood as corruption (Begovic, 2005). To identify the types of abuse that constitute corruption, the scope can be narrowed to acts violating the law. However, due to differences in legislations across countries, what is considered corrupt under one legal system, can be a legitimate practice under another, even if it is harmful to public interests (Gardiner, 2007). For example, until recently, payments to foreign officials in some countries were considered tax-deductible commissions (Tanzi and Davoodi, 1998). OECD reviewed its member countries' legislations on tax treatment of bribe payments as recently as 2011 (OECD, 2011b). Political donations by industries are sometimes thought to create conflict of interest for politicians who are entrusted to uphold public interests. Despite these concerns, donations continue to be legal means of financing political campaigns, albeit there are suggestions of strengthening regulations of political donation systems (Thompson, 2004).

To some anti-corruption researchers and practitioners, corruption "is not at bottom simply a matter of law; rather it is fundamentally a matter of morality" [17] (Miller, 2005). Definitions such as "despoiling of the moral character of a role occupant" [18] (Miller, 2014) and "breaches of legal, moral, or social norms" [19] (Misangyi et al.,

2008) are subjective, relying on public opinion to identify what is to be considered immoral. Hence, what is corrupt under such definitions varies across cultures and time (Kurer, 2005). Indeed, the rules of institutions may themselves be immoral, but actions of breaking these rules could still constitute corruption. One such example is the special case of 'noble cause' corruption where, for instance, an individual bribes a Nazi prison guard to release a prisoner (Hodgson and Jiang, 2007).

Definitions set out with a view to specify a set of actions that fall under the term corruption focus on the type of behaviour expected from individuals occupying the roles of responsibility, and the motivations for transgressions. For example:

> "Corruption is behavior which deviates from the formal duties of a public role because of private-regarding (personal, close family, private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding influence." [9] (Nye, 1967, p.419)

Other writers, recognising that rules or duties may not always be clearly set out, creating ambiguity leading to corruption, refer to principles guiding individual behaviour, such as the impartiality principle and non-discrimination norms (Kurer, 2005). According to such principles, an individual's decision-making processes should comply with the expectations of neutrality, and resist "the wilful subversion (or attempted subversion) of a due decision-making process with regard to the allocation of any benefit" [11] (Sole, 2005). Similarly, the arm's-length principle, requiring "that personal or other relationships should play no part in the economic decisions that involve more than one party" (Begovic, 2005, Tanzi, 1996), is at the core of the concept of corruption defined as "the intentional non-compliance with the arm's-length principle aimed at deriving some advantage for oneself or for related individuals from this behaviour" [12] (Tanzi, 1996).

All of the above definitions focus on individuals who abuse their powers and, as touched upon in definition [12], provide some unfair advantages to others. However, to fully understand corruption, it is necessary to consider both supply and demand sides of it (Tanzi, 1998b). Yet, most corruption definitions largely ignore those benefiting from such unfair advantages, who provide incentives to officials in the form

of bribes. Perhaps because of this focus on the bribe-takers, enforcement actions tend to be tougher on the bribe-takers than the bribe-givers. Nell (2007) shows that some countries' penal codes provide leniency clauses, offering exemption from punishment for those parties involved in corruption who come forward and self-report to the authorities prior to the official investigation. In an analysis of legal statutes of 56 countries, Nell found 26 that contained such leniency clauses for bribe-givers, but only three countries provided leniency for bribe-taking officials.

Every definition creates its own contentions and there is no single definition that fits all corruption cases. The next section turns to the types and manifestations of corruption to illustrate the many forms it takes.

2.2.2 Types and manifestations of corruption

This section discusses the phenomenon of corruption by reviewing the commonly identified types and manifestations of corruption. Corruption occurrences differ across settings, and, as noted in Section 2.2.1, can occur in both private and public sectors. It varies in objectives it fulfils; the types of gains attained though corruption; in how benefits are allocated or shared; and the level of organisation and incidence.

In the public sector, two types of corruption are identified. The first is high-level political or grand corruption, occurring at top levels of the public sector. In this case, a bribe-giver attempts to influence policy formation in such a way that it provides an advantage to them or their industry. One example of this type of corruption is state capture (Hellman et al., 2003) where firms influence policy on issues such as access to resources and labour. A related but distinct example is regulatory capture (Laffont and Tirole, 1991), concerned with industry or natural monopoly regulations. The second type of corruption in the public sector is lower-level bureaucratic or petty corruption, where the issue at stake is the implementation of regulations or policies. The value of advantages that can be provided at this level, and the potential harm caused to society, are thought to be lower than with political corruption (Kenny, 2006). Using their discretionary powers over policy interpretation, a bureaucrat can sell benefits by acts of omission (e.g. allowing embezzlement from public or project funds to go

unnoticed), or commission (e.g. providing driving licences to candidates who did not pass the test).

One of the purportedly redeeming features of corruption is concerned with the type of corruption known as facilitation payments that "smoothen the process of transaction" (Mandal and Marjit, 2010) and correct for the overly cumbersome bureaucratic state and bad public policies (Rose-Ackerman and Truex, 2012). This notion was widely explored in the mid-20th century and led to the development of literature on efficiency-enhancing corruption (Leff, 1964, Lui, 1985, Beck and Maher, 1986, Lien, 1986). Instead of being a solution to the unnecessary red tape in government processes, corruption can be interpreted as its cause. Observing the potential to profit from slow processes, bureaucrats can further complicate the system, creating new incentives for individuals requiring their services to circumvent the system by paying bribes (Banerjee et al., 2012, Aidt, 2009).

These perverse incentives to complicate the system can spread to higher levels of government. By designing inefficient institutions, politicians can provide opportunities for bureaucrats to collect economic rents, who in turn share the proceeds with higher echelons of government. Thus, individual unconnected sporadic instances of corruption can be replaced by systemic corruption with organised sales of influence over decision-making processes (Kaufmann, 1998). In such cases, corruption becomes the norm, and the proceeds from corruption are shared among officials in all levels of government.

The sales of advantages in individual corruption cases are thought to be motivated by personal gain, whereas institutionalised corruption can benefit the institution itself (Thompson, 2013). An example of institutional corruption is found in the political sphere, where policies benefitting particular interest groups are sold in return for political donations, which in turn finance election campaigns, helping the party to obtain or retain government office. Corrupt decisions in such cases often become centralised, with each member of the institution following the leading position, such as voting on legislative issues as dictated by corrupt payments made to the central institutional fund. Individuals systematically providing corrupt services in exchange for

promoting interests of their institution can indirectly benefit from enhanced institutional ability to meet certain objectives, but at the cost of institutional legitimacy (Thompson, 2013). Ultimately, the ability of institutions to fulfil their purposes can be undermined. This is the case with organisational corruption, which is understood as violation of organisational rules which were laid down to enable the organisation to meet its goals (Hodgson and Jiang, 2007).

When corruption becomes systemic, it often relies on complex networks that underpin its existence and supports its survival. Whereas unorganised 'market' corruption is based on demand and supply of advantages and favours (Cartier–Bresson, 1997), long-standing large-scale systemic corruption relies on power networks to organise exchanges (Carvajal, 1999). Corrupt networks can be based on social networks, such as social clubs that foster trust and cooperation (Boehm and Lambsdorff, 2009). Where corruption is organised through networks, exchanges become more predictable and corrupt relationships more stable because opportunism (i.e. promising an advantage, but not delivering after receiving a bribe) is more difficult. Members of a corrupt network can monitor each other's behaviour and sanction opportunists by exclusion from both the corrupt network exchanges, and the social network. Because of the reliability corrupt networks offer, the timing and the nature of corrupt reciprocity may not be specified, creating a "futures market of favours and privileged information" (Cartier–Bresson, 1997).

Systemic corruption can lead to a contagion spreading through the entire public sector and beyond, into other spheres of society. The phenomenon of 'revolving doors' between the public and the private sectors refers to movements of individuals between the public-sector roles, and positions in private companies. Although, by itself, the transfer between roles does not necessarily involve corruption, it can present a conflict of interest for individuals and impact on how they understand their roles (Wilks-Heeg, 2015). Additionally, a promise of a future lucrative position on the board of directors is one of the corrupt incentives that can be used to motivate public officials to look after the interests of the company or the industry. For this reason, transfers from public to private-sector jobs are often monitored by organisations such as the UK Advisory Committee on Business Appointments (ACOBA).

There are many types of benefits that can be exchanged in corrupt agreements. Besides the most commonly recognised incentive of a monetary bribe, other financial offers can be made, such as guaranteeing a loan, or selling goods at below-market price (Boehm and Lambsdorff, 2009). A corrupt agreement can also take the form of a barter – an exchange of goods or services (Cartier–Bresson, 1997). In fact any kind of resource can be offered, including information, power, or loyalty (Carvajal, 1999).

The institution an agent belongs to, and the position they occupy, dictate the powers they are entrusted with, and the potential advantages they could offer for sale. In many cases, the distinction between private-sector and public-sector corruption blurs or even becomes irrelevant. For example, where a company is partially or fully privatised, the powers of its employees to provide preferential treatment to certain clients remain the same. A governmental organisation may delegate some functions, such as overseeing the project bidding procedures, to a private company. If a bidding company bribes the company responsible for the bidding process, the content of the corrupt act remains the same as if the governmental organisation itself carried out this function. However, corrupt exchanges between private companies without involvement of public officials attract less focus because it is thought that the private sector is better able to look after its own interests, and the impact of corruption entirely in the private sphere is sometimes thought to be less damaging to society (Argandoña, 2003). As examples above illustrate, the damage of private-to-private corruption can be identical to private-to-public corruption, but legal suits are less likely to be brought, and are less likely to be successful (Argandoña, 2003). Additionally, a fall in public-sector corruption may mean an increase in private-sector corruption (Rose-Ackerman and Truex, 2012) that can be attributed to factors such as revolving doors, privatisation and delegation of roles to private-sector companies.

Public attitudes to corruption vary depending on its manifestations. If an official initiates a corrupt transaction and extorts a bribe, they are likely to be judged more harshly than if they accept a bribe where the other party was the initiator (De Graaf, 2007). Officials are judged more severely the greater is the amount of the accepted bribe, and corrupt officials are treated more leniently if they are appointed rather than if they are elected (Malec, 1993). Corruption occurrences can be categorised as black,

grey or white (Heidenheimer, 1970) according to the extent to which public opinion would condemn them (Gardiner, 2007). The attitudes towards corruption, and how each action is classified depend on the political culture (Collier, 2002). For example, nepotism and patronage can be classed as white corruption in collectivist societies, and such behaviour is unlikely to attract strong calls for punishment. In an individualistic culture, the same actions would be considered grey corruption and some people would call for disciplinary action. Yet in egalitarian societies nepotism and patronage would most likely evoke popular disapproval, and would be considered black corruption.

Corruption occurrences differ across institutions, individuals' positions, and the types of advantages traded. It can affect policy formation or implementation, depending on the level of government influenced by corruption. Where an individual has power over recruitment and promotion, it can take forms of nepotism and cronyism, allowing them to buy loyalties and allow their other transgressions such as embezzlement to go unreported.

Embezzlement from project funds and collusion between firms in bidding processes are sometimes understood as forms of corruption (Sohail and Cavill, 2008), and literature on embezzlement is included in the sections that follow. In this thesis, however, corruption is interpreted as an exchange of some types of benefits between agents. This can include reciprocal exchanges which are not time-bound (i.e. "futures markets of favours and privileged information" (Cartier–Bresson, 1997)), with the benefits including power, loyalty and information (Carvajal, 1999). Therefore, embezzlement and collusion are breaches of organisational and institutional rules, but are not corruption in this sense, as exchanges of benefits between agents would not usually take place[1]. However, forms of nepotism and cronyism described above, as well as cases of bribery such as payments or other benefits given to monitoring agents

---

[1] Collusion could be better described as individuals or companies agreeing to coordinate their actions to maximise their profits and to gain an unfair market advantage, rather than an exchange of benefits between them.

as incentives to overlook other transgressions fall under the interpretation of corruption adopted for this thesis.

The nature of incentives used varies with the level of organisation of corruption. The most basic form of an incentive used in sporadic decentralised corruption is a financial reward, or bribery. For more organised social exchanges of favours, a corrupt network is required, and such exchanges are based on higher levels of trust. It has been suggested in past literature that, unlike corrupt social exchange networks, economic exchange corruption involved in market corruption is characterised by lack of "rules of the game" (Cartier–Bresson, 1997). There is certainly a lower level of organisation, but every corrupt agreement has its own identifiable steps and rules of negotiation (Boehm and Lambsdorff, 2009).

Finally, the benefitting parties are not necessarily the agents directly involved in setting up a corrupt agreement. They certainly derive some benefit from it, but the motivation for actions may be the promotion of institutional or organisational interests.

To summarise, this section reviewed literature on the definitions and types of corruption, illustrating the multifaceted nature of the phenomenon. The lack of agreement between scholars on a definition of corruption means that there is no consensus around the kinds of behaviour that come under the term 'corruption'. The first narrowing down of the meaning of corruption in this thesis has been made in this section to the types of corrupt behaviours involving an exchange between agents. Chapter 4 develops this further and looks in more detail at the types of agents, exchanges and benefits present in such types of corruption.

The next two sections review theories of corruption causes, and the proposed methods of its reduction, retaining the focus on the many different manifestations of the phenomenon.

2.3 Theories and models of corruption

2.3.1 Overview

This section reviews key strands of literature examining causes of corruption. Understanding the root causes is necessary for developing methods of corruption prevention, and these will be reviewed and evaluated in Section 2.4. Each academic discipline offers its own view on what the causes are, and what mechanisms lead to corrupt behaviour. The categorisation of theories in this section and their associated recommended anti-corruption policies follows the works of De Graaf (2007), where the focus is on public-sector corruption causes, and Ashforth et al. (2008), where the analysis is provided for the private-sector counterparts. Theories and models from different disciplines are reviewed and arranged according to the classifications offered in these two papers. Analyses and models often do not fit neatly under one classification. However, every effort has been made to make clear distinctions between the different causes, and illustrate a broad range of mechanisms leading to corruption.

Broadly, there are three levels of analysis: micro, meso and macro (De Graaf, 2007). Micro-level analyses often consider corruption to be a problem of a few bad apples existing in otherwise non-corrupt environments. Rational choice and 'bad apples' theories provide explanations for corrupt behaviour at the micro level, focusing on individuals, their characteristics and decision-making processes. Organisational culture theories belong to meso level, analysing organisational or group factors that affect or pre-determine individual behaviour. Macro-level theories explore societal variables that produce corrupt behaviour, either by directly influencing individuals and their actions (clashing moral values theories), or acting via organisational structures by creating emphasis on performance, combined with weakened concern for ethical standards (the ethos of public administration theories). Figure 1 on page 32 represents diagrammatically the causal links between macro-, meso- and micro-level factors that are theorised to bring about corrupt behaviour. The figure was developed based on the discussion in De Graaf (2007). The theories and the causal links are discussed below.

The level of analysis chosen for modelling and analysing corruption is largely determined by the types of tools available within disciplines. As such, in economics, corruption is mainly modelled at either the level of individuals, or at macroeconomic level. Through applications of rational choice theory (Coleman and Fararo, 1992) and game theory (Osborne, 1994), corrupt behaviour is represented as emerging through individuals making rational choices over available actions. Macro-level causes of corruption, on the other hand, are analysed using econometric techniques, such as cross-country regression analyses (Park, 2003, Seldadyo and De Haan, 2005), to observe what factors correlate with high levels of perceived corruption. Unlike other theories reviewed in this section, 'correlation theories', to use De Graaf (2007) terminology, often do not offer hypotheses of the underlying causal links between the different factors and corruption. Therefore, these may not be thought of as theories in the same way as the other ones reviewed in this section. Nonetheless, for consistency with the review in De Graaf (2007), and because this strand of literature using regression analysis offers several often-cited anti-corruption policy recommendations, it is included in this and the following sections.

There is a lack of economic analysis exploring organisational determinants of corruption. Sociology, on the other hand, is better-equipped than economics to analyse how organisational culture, norms and values bring about individual behaviour. Thus, studies analysing organisation-level causes of corruption mostly come from sociology, yet this area remains underexplored (Pinto et al., 2008). Additionally, psychology provides insights into environmental causes leading to psychological processes that, in turn, bring about individual behaviour (Chugh, 2012); and political science contributes to the understanding of macro-level factors such as economic inequality (Uslaner, 2010). Table 1 lists the theories and models reviewed throughout Section 2.3.

Table 1 Theories and models reviewed in Section 2.3

Level	Theory types	Examples
Macro/ Societal	Correlation theories	(Seldadyo and De Haan, 2005) (Judge et al., 2011)
	Clashing moral values	(Licht et al., 2007)
	The ethos of public administration	Efficient corruption Queuing models (Lui, 1985, Kleinrock, 1967) Bidding models (Beck and Maher, 1986)
Micro/ Individual	Public Choice theories; 'Bad apples' theories	Learning Principles (Chugh, 2012) Rent-seeking models (Cadot, 1987, Rasmusen and Ramseyer, 1994, Niehaus and Sukhtankar, 2013) Principal-agent models (Groenendijk, 1997, Aidt, 2003, Lui, 1986) Corruption as transactions (Bayar, 2005, Bayar, 2009) Corruption networks (Uribe, 2012)
Meso/ Organisational	Organisational culture	(Pinto et al., 2008, Lange, 2008)

Theories → / Levels of analysis ↓	Public Choice	Bad apples	Organisational culture	Clashing moral values	The ethos of public administration	Correlation theories
Society (macro)				Societal values and norms directly influence norms and values of individuals	Societal pressure for efficiency and lack of attention to integrity leads to:	No definitive causal links. Collection of variables that correlate with corruption at each level
Organisation (meso)			Corrupt organisational culture leads to certain mental states		creation of an organisational emphasis on performance and effectiveness, with weak accountability.	
Individual (micro)	Rational decision-making	Bad character	These mental states, in turn, lead to corrupt behaviour	Blurred distinction between public roles and private responsibilities lead to corrupt behaviour	In turn, leading corrupt individuals	
Corrupt behaviour (outcome)						
Policy recommendations	Individual incentive-based: increase costs, reduce benefits of corruption	Identify and remove bad apples. Training on ethics, instilling strong moral values	Influence the culture of the organisation: leadership by example or change of leadership	Create and enforce codes of conduct. Ethical training. Eliminate patronage. Instil merit-based principles	Influence the culture of emerging democracies. Public awareness campaigns. Raise concerns about the negative consequences of corruption	

Figure 1 Summary of corruption mechanisms and recommendations for corruption reduction across different types of theories

2.3.2 Theories and models based on correlation analyses

The first strand of literature reviewed in this section looks for causes of corruption predominantly at macro level. However, correlation analyses can also be used to understand how variables at different levels – macro, meso and micro – correlate with corruption.

In economics, regression analyses studying corruption are most frequently carried out with macro-level cross-country data. The causal links are not always identified, and the recommendations for corruption reduction are often not clearly set out (De Graaf, 2007). However, this literature provides an insight into factors that may facilitate corruption, or at least provides sets of conditions in which corruption flourishes.

Macro-economic analyses can help understand economic, political, institutional and cultural environments in which corruption thrives (Seldadyo and De Haan, 2005, Judge et al., 2011, DfID, 2015, Park, 2003). Among economic variables, income, usually measured by GDP per capita, is most often shown to be negatively correlated with corruption (Seldadyo and De Haan, 2005). One of the explanations provided for this relationship is that poverty creates incentives to give and receive bribes (Judge et al., 2011). Income distribution also matters, and higher inequality is associated with higher corruption levels. However, inequality is also identified as one of the outcomes rather than causes of corruption (Tanzi, 1998b, Mandal and Marjit, 2010). Studies focusing on country development generally suggest that corruption is a poor-country problem, and its alleviation relies on economic development.

Another economic variable negatively correlated with corruption is international competition (Judge et al., 2011). The proposed solution to corruption, then, is to foster competition (Emerson, 2006, Ades and Di Tella, 1999). The intuition behind this argument is that competition reduces excess profits from which bribes can be paid (Bliss and Di Tella, 1997).

Political factors such as democracy, political accountability and civil liberties are also associated with lower levels of corruption (Seldadyo and De Haan, 2005). Thus, corruption reduction measures proposed are fostering economic and social freedoms, decentralisation, deregulation and increased accountability (Park, 2003).

Among bureaucratic and regulatory variables, the rule of law, an independent judiciary and the quality of the bureaucracy negatively correlate with corruption (Seldadyo and De Haan, 2005). Socio-political stability is identified as an important factor (Park, 2003). In settings characterised by high ethnic heterogeneity, corruption is more prevalent.

Regression analyses provide an insight into factors associated with high corruption. Drawing conclusions about the directions of causality, however, is difficult, especially because corruption perception indexes used are weak proxies for the actual extent of corruption (Kenny, 2006, Olken, 2009). Recommendations for methods of mitigating corruption risks based on observed correlations, without understanding the mechanisms of corruption, risk misleading policy makers and creating new incentives and opportunities for corruption (Boehm, 2009).

2.3.3   Macro-level theories and models

The "clashing moral values" type of theories proposes a direct link between macro-level societal factors such as values and norms, and individual norm internalisation, leading to corrupt behaviour. Individuals occupy a number of roles within society, each carrying certain obligations and responsibilities. A conflict can arise when expectations and norms associated with one role clash with those of another role. Recommendations for corruption reduction in this case include establishment of codes of conduct and ethical training in the public sector, eradication of patronage systems and instilling merit-based principles (De Graaf, 2007).

34

An example of clashing moral values can be found in the expectations placed on public officials. On the one hand, an official is expected to fulfil their role as a civil servant with impartiality and applying the arm's-length principle in their decisions (see Section 2.2.1). On the other hand, there are cultural expectations placed on them related to upholding the interests of their community. Thus, the legal or civil-service norms can conflict with the widely-accepted social norms. In such cases, even if some practices are illegal, they may not be considered a wrongdoing by certain social groups if these practices are socially acceptable and economically beneficial (Rose-Ackerman, 2010a). For example, in cultures where community ties tend to be strong, such as in India, there is social pressure to promote the interests of the community. The arm's-length principle applied in such an environment might be seen as an alien concept – it would mean taking the interests of the wider society of strangers over the wellbeing of the tightly-knit close relations. The stronger and closer the social relationships, the greater the potential for social pressure-induced corruption, and the harder it is to identify and punish such corruption (Tanzi, 1996).

Data analyses indeed show that cultural values have an impact on the prevalence of corruption. Licht et al. (2007) adopt insights from psychology to carry out a regression analysis testing for the impact of cultural embeddedness, as proxied by linguistic attributes, on corruption. They find that cultures promoting individual autonomy are correlated with higher levels of law abidingness and lower levels of corruption. Conversely, higher levels of cultural embeddedness and stronger community relations are associated with higher corruption levels.

The "ethos of public administration" theories consider mechanisms through which causes of corruption at macro level permeate through the level of organisations and affect individuals. One such root cause is the societal pressure for efficiency and performance, with simultaneous disregard for

integrity and ethics (De Graaf, 2007). Despite the emphasis on public administration made by De Graaf (2007), this strand of theories is relevant both for public and private-sector corruption, where competitive pressures can, in some circumstances, support tolerance of corruption. Methods of reducing corruption, then, are awareness campaigns, drawing attention to the negative consequences of corruption (De Graaf, 2007).

Libertarian thinkers find causes of corruption in the failures and inefficiencies of the state. According to this literature, corruption is a second-best solution for improved efficiency achieved through circumventing the cumbersome governmental red tape and bad policies (Rose-Ackerman, 2010a, Rose-Ackerman and Truex, 2012). The first-best solution in this view is reduction in governmental interventions and liberalisation, allowing the self-correcting market pressures to reduce deadweight (Tanzi, 1998b).

In the presence of weak institutions, corruption is sometimes thought of as a method of problem solving (Marquette and Peiffer, 2015). In order to design methods for corruption reduction, it is prudent to take into consideration the types of functions corruption may be fulfilling, and find alternative methods of achieving the goals. Where the economic environment is characterised by government-imposed rigidities, investment may be undermined, leading to low economic growth. Corruption, then, is seen as enabling investors and companies to cut through the red tape and grease the bureaucratic processes, improving efficiency (Leff, 1964, Huntington, 2006).

The most prevalent efficiency-enhancing models of corruption are represented as queuing and bidding models. Although these models may fit better with the micro-level models discussed in Section 2.3.4, the root causes and proposed solutions of queuing and bidding models are akin to those offered by libertarian thinkers discussed above – smaller state combined with allowing markets to reduce deadweight. Queuing models show how bribing an official who is distributing some economic good can increase efficiency by reducing waiting

time costs (Lui, 1985, Kleinrock, 1967). Corruption in this case can be efficient in the sense that it saves time for those whose time has the greatest value, and in some circumstances can improve the allocation of resources (Lui, 1985). Bidding models show that the most efficient firms that expect to achieve the highest profits from projects are prepared to pay the highest bribes. It is argued that bribes, then, promote efficiency by helping to allocate the projects to the most efficient firms based on their willingness to pay (Beck and Maher, 1986, Lien, 1986).

Although efficiency-enhancing models of corruption are not recent, and despite the empirical evidence against the notion of corruption as grease for economic development (Méon and Sekkat, 2005, Mauro, 1995), it is worth noting them for two reasons. Firstly, the models and the ideas behind them are still being referred to (Tanzi, 1998b, Aidt, 2003, Aidt, 2009, Marquette and Peiffer, 2015), and secondly, evidence for corruption as efficient grease is still being sought and found for countries with extremely ineffective institutions (Méon and Weill, 2010).

2.3.4   Micro-level theories and models

At micro level of analysis, the assumption is made that individual characteristics give rise to corrupt behaviour. In formal models, individuals are endowed with the capacity to make autonomous decisions, which are not pre-determined by organisational or environmental factors (although facilitating factors such as the existence of corruption opportunities are sometimes included in the analysis (Bayar, 2005, Uribe, 2012)). One type of theories at this level of analysis is the Public Choice Theory (De Graaf, 2007), according to which behaviour arises from rational decision-making processes, with individuals comparing costs and benefits of alternative courses of action and making optimal choices that maximise their utility or income. Policy recommendations from this theory focus on increasing costs or reducing benefits of corrupt behaviour. Methods of increasing costs include establishing and enforcing legal sanctions for

corruption, levying penalties and other punishment of transgressors, accompanied by monitoring behaviour through audits. Reducing benefits is more difficult. However, as money laundering is often associated with corruption (Levi et al., 2007), proceeds of corruption in the form of bribes can be confiscated through anti-money laundering enforcement.

Another type of theories at micro-level is 'bad apples' theories. In this view, the cause of corrupt behaviour is bad character, predisposition to criminality, or lack of moral values of individuals. Corruption reduction methods streaming from these theories are identifying and dismissing the bad apples, or instilling strong moral values through ethical training (De Graaf, 2007). Alternative causes identified in this type of theory are lack of self-control, low cognitive moral development or bad ethical choices made by otherwise good individuals (Ashforth et al., 2008).

In psychology, individual corrupt behaviour is shown to arise from the processes of learning, reinforcement, desensitisation and habituation to corrupt acts, leading to helplessness in the face of widespread corruption, and development of self-serving bias that support corrupt behaviour (Chugh, 2012). Although environmental and group impacts on individual behaviour are considered in psychology, proposed methods of reducing corruption are micro-level and focused on conditioning individuals via systems of rewards and punishments.

In economics, the most prevalent micro-level models of corruption are developed based on principal-agent and rent-seeking theories (Begovic, 2005, Jain, 1998a, Jain, 1998c, Cartier–Bresson, 1997, Hopkin, 2002). Rent-seeking refers to "directly unproductive activities" (Jain, 1998a) that affect resource allocation. For example, a company might attempt to gain monopoly power in a region by influencing local officials in charge of operation licences allocation. If successful, the company is then able to charge monopoly prices for their services, collecting economic rents (returns to factors of production above their

economic costs). For this type of rent seeking to be possible, the officials require a) monopolistic power over the process of licence allocation; b) willingness to misuse this power; and c) the existence of economic incentives for them to do so (Jain, 1998c) (e.g. where the company is willing to provide a bribe in return for officials preventing entry of other companies into the local market). In this basic model, self-interested officials and private-sector agents are willing to engage in rent-seeking if benefits outweigh the costs. Rent-seeking models have been developed to analyse corruption in areas such as permit allocation (Cadot, 1987), legislative vote selling (Rasmusen and Ramseyer, 1994), and embezzlement (Niehaus and Sukhtankar, 2013).

Principal-agent models build on rent-seeking models by introducing relationships between corrupt agents and their principals, on whose behalf agents make decisions. The principal-agent relationship is characterised by asymmetries of information. That is, agents may have incentives to abuse their power, but principals have no costless way of observing and controlling agents' actions, and this may lead to adverse or undesirable outcomes for the principal (Groenendijk, 1997). Principals, however, can a) engage in costly behaviour monitoring of their agents, punishing transgressions; b) limit agents' discretionary powers; or c) provide agents with incentives to choose actions leading to outcomes favoured by principals (Aidt, 2003, Groenendijk, 1997). In the example of licence allocation above, the agents are the bureaucrats in charge of allocating licences, and their principals are the politicians delegating responsibility for policy implementation (i.e. licence allocation) to the bureaucrats. The principals can be represented as benevolent actors, who are honest and not corruptible (Aidt, 2003, Lui, 1986). Alternatively, the population can represent the principals, electing non-benevolent corruptible politicians who are expected to represent the population's interests and allocate resources on their behalf. In this representation of the principal-agent model, both the bureaucrats and the politicians may engage in rent-seeking activities (Groenendijk, 1997, Begovic, 2005, Jain, 1998c).

Principal-agent and rent-seeking models generally focus on the bribe-takers (usually, public officials) and their motivations and incentives, leaving the incentives of bribe-givers largely unexplored (Tanzi, 1998b, Hodgson and Jiang, 2007). The process of corrupt negotiations and associated decision-making processes are not set out explicitly, and are left as a 'black box' (Kaufmann and Vicente, 2011). This detail is captured in theories and models viewing corruption as a type of transaction, with its own demand and supply of favours and transaction costs (Boehm and Lambsdorff, 2009, Cartier–Bresson, 1997). Models in this strand of literature represent both the bribe-takers and the bribe-givers as utility-maximising agents. The outcomes for individuals vary depending on which side initiates corrupt negotiations, and introduction of facilitators, such as corruption intermediaries, reduces perceived risks of corruption by modifying agents' beliefs (Bayar, 2005, Bayar, 2009). Social networks between agents act as facilitators, and create opportunities for corruption, promoting trust between actors (Uribe, 2012). However, the exact mechanisms and logical connections between networks, trust, and belief formation, and how probabilities of, for example, being denounced are formed, have not yet been clearly set out.

Individual behaviour as represented in the above models mostly falls under the Public Choice Theory category. That is, agents' behaviour is driven by self-interest, and choices are made to maximise the expected payoff, income, or utility, subject to informational asymmetries and risk aversion. Moral costs of engaging in corruption are rarely taken into consideration. Where these costs are referred to, they are either not formally represented (Bayar, 2005, Situngkir, 2003), or, if represented, then only as one additional cost parameter in the payoff functions, disregarding the content and sources of these costs (Groenendijk, 1997). Another method of representing norms against corruption common in economic literature is through the individual level of honesty. The causes of corruption in such models are similar to those underlying the 'bad apples' theory: bad character, whatever the source, leads to corrupt behaviour.

Formal models represent this through separation of actors into honest or dishonest (corrupt) groups. Corrupt agents make decisions solely based on maximising own utility, whereas honest groups are assumed to have strong moral values that prevent them from engaging in corruption. Decision-making processes of honest actors are generally not developed any further. In this setup, actors have no knowledge of the types of individuals they are facing, and base their decisions on the probability of facing an honest partner (Aidt, 2003, Uribe, 2012, Bayar, 2005, Bayar, 2009). Alternatively, individuals are represented as having a degree of honesty on some scale (Situngkir, 2003, Lui, 1986).

It is recognised that not all individuals are driven solely by monetary considerations, and moral value orientations and social norms also guide behaviour (Rose-Ackerman, 2010a). In contexts where moral commitment and norms of behaviour are important, "rational utilitarian calculations of gains and losses are widely regarded as insufficient for deciding behaviour" (Hodgson and Jiang, 2007, p. 1051), and actors may be better represented as being rule-driven, rather than welfare-maximising.

2.3.5   Meso-level theories and models

Unlike corruption theories analysing the phenomenon at individual level, theories that identify causes of corruption at organisational and societal levels do not endow individuals with full control over their decisions and actions. Instead, behaviour is seen as the product of influences beyond individual control. In organisational culture theories, the culture and structure of organisations, and their established corrupt practices and arrangements determine corrupt behaviour through affecting individual mental states (De Graaf, 2007). Solutions to corruption in this case involve challenging organisational culture and instilling ethical practices through training, establishment of better systems of reporting and disciplining corrupt behaviour, and, where necessary, change of leadership (Ashforth et al., 2008).

Pinto et al. (2008) offer and analyse two types of organisational corruption: Organisation of Corrupt Individuals (OCI), and Corrupt Organisation (CO). In OCI, individuals are the primary beneficiaries of corruption, and often individual gain is obtained at the expense of the organisation. Even though individuals do not coordinate their actions and this type of corruption resembles micro-level examples outlined above, OCI manifests itself in certain organisational environments. When the proportion of 'bad apples' in an organisation is large, the problem is analysed at the organisational level, searching for factors that explain how individual corrupt behaviour is facilitated, encouraged or sustained within an organisation. CO, on the other hand, is characterised by corrupt individuals acting in consort with each other for the benefit of the organisation.

One of the mechanisms identified in Pinto et al. (2008) that leads to both OCI and CO types of corruption is the process of selection, or, in other words, staff recruitment. That is, individuals are employed from a societal group characterised by low levels of integrity or ethics. Alternatively, a number of socialisation mechanisms leading to corrupt behaviour are offered. Corruption can spread through social networks, where corrupt behaviour is learnt and adopted through interactions with other actors. Cognitive mechanisms include normalisation of certain behaviour, and corrupt actions are triggered by cues such as reductions in salaries. The type of mechanisms more commonly leading to OCI than CO is through emotional triggers. For example, if organisational practices are considered unfair towards its employees, or job satisfaction levels are low (Carvajal, 1999), emotional responses can give rise to individual uncoordinated unethical behaviour and corruption. Social psychological mechanisms include social identification with a certain group. In the case of OCI, it is the identification with entities outside the organisation that triggers corruption, and in the case of CO, it is loyalty to, and association with the organisation itself that leads to corrupt actions on behalf of the organisation.

2.4 Corruption reduction measures

2.4.1 Overview

There are a large number of suggested corruption prevention or reduction mechanisms. Evidence for their effectiveness is growing, and comes from studies such as macroeconomic analyses, case studies of different interventions, surveys, and psychological laboratory experiments. Conclusions of different studies sometimes conflict with each other because of the level of aggregation of data and information.

It is important to note that corruption can have different causes, manifestations and effects. Understanding the causes and mechanisms leading to corruption is necessary to avoid attempting to reduce corruption by treating the consequences, rather than the causes of corruption. Additionally, what is effective in reducing one type of corruption may not have the same effect on another, and a combination of measures should be developed backed by a good understanding of the context (Marquette and Peiffer, 2015). Indeed, some corruption prevention measures can have unintended negative consequences such as displacing corruption from the public to the private sector, or causing a substitution of one corruption type for another, without reducing the problem.

This section reviews corruption reduction measures and summarises the evidence of their effectiveness. Where possible, mechanisms through which different measures can affect corruption are provided, and any unintended consequences are explained.

Anti-corruption measures based on regression analyses are discussed in Section 2.4.2. Macro-level solutions based on reducing the size of the state are evaluated in Section 2.4.3. Sections 2.4.4 and 2.4.5 cover micro-level solutions. Meso-level or organisational control solutions are outlined in Section 2.4.6, and Section 2.4.7 summarises the collective action-based recommendations.

2.4.2 Anti-corruption measures based on correlations

As outlined in Section 2.3.2, one of the conclusions of macroeconomic analyses is that corruption is a problem of low-income developing countries, or countries undergoing transitions towards the market economy (Hellman et al., 2003). Economic growth, then, is sometimes prescribed as a cure for corruption. This view ignores the fact that corruption is not only present in developing economies, but is also endemic in some developed countries (Bicchieri and Duffy, 1997), including the European Union (Brandt and Svendsen, 2013). The direction of causality can run both ways: low levels of growth may promote corruption, or corruption may itself be a barrier to economic, social and political development and growth (Rose-Ackerman, 2006, Sohail and Cavill, 2008). There is a lack of literature explicitly setting out the mechanisms through which low levels of growth can cause corruption. One of the suggestions is that economic need creates incentives for corruption (Carvajal, 1999). In contrast, there is ample literature studying effects of corruption on growth. For example, corruption is shown to hamper growth by reducing private investment (Mauro, 1995). Additionally, it increases public investment, whilst reducing its quality, and diverts finance away from maintenance of existing infrastructure, leading to its deterioration (Jain, 1998b). Corruption can also lower government revenue and increase budget deficit, through reduction in tax collected (Tanzi, 1998a).

The observation that low corruption is correlated with high competition led to the conclusion that increased competition can decrease corruption (Emerson, 2006, Ades and Di Tella, 1999). The intuition behind this argument is that competition reduces excess profits from which bribes can be paid (Bliss and Di Tella, 1997). However, Warner (2007) shows how competitive pressures increased corruption in the European Union. The basic incentive for companies to engage in corruption is profit-seeking. One of the mechanisms to achieve higher margins is by reducing competition. Faced with new market entrants,

44

firms are expected to invest in efficiency-enhancing systems to remain competitive. This requires time, effort and availability of finance. Corruption may be perceived as a cheaper and more attractive short-term method of obtaining new projects. Lambert-Mogiliansky and Sonin (2006) consider strategic complementarities between corruption and collusion in tendering processes. Their recommendation is for competition authorities and criminal courts to coordinate their efforts and tackle corruption and anti-competitive practices simultaneously.

Although socio-political stability can be one of the deterrents of corruption (Park, 2003), it is doubtful whether stability and the rule of law can be achieved in highly corrupt environments without addressing corruption and its underlying causes. Corruption can cause instability and security threats in countries such as Afghanistan by disenfranchising the population who suffer the consequences of the actions of corrupt officials and companies (Chayes, 2015).

2.4.3 Smaller state solutions

Libertarian thinkers find the root causes of corruption in large inefficient governments (see Section 2.3.3), intruding in every aspect of the society and the economy (Rose-Ackerman, 2010a). Where economic activities such as production and distribution of goods and services are controlled by the state rather than being guided by market pressures, inefficiencies occur. Corruption is, therefore, viewed by some writers as an efficiency-enhancing mechanism, allowing individuals to circumvent the bureaucratic red tape. Regulation is thought to be a direct factor promoting corruption, by providing individuals with incentives to seek means to avoid facing costs and delays associated with regulatory systems (Tanzi, 1998b). Solutions to corruption, then, would involve reducing the size of the state and its involvement in economic activities, through privatisation, deregulation, and promotion of competition.

Corruption's purported ability to improve efficiency by cutting through the governmental red tape that inhibits investment (Huntington, 2006, Leff, 1964) and to allocate resources to the most efficient agents (see queuing and bidding models in Section 2.3.3) (Beck and Maher, 1986, Lien, 1986, Lui, 1985) are considered redeeming features of corruption. Corruption, in this view, can be an acceptable practice if it involves speeding up low-level routine bureaucratic processes (Sohail and Cavill, 2008). Models and theories based on these ideas generally disregard negative externalities of corruption and ignore the motivation to design institutions to maximise economic rents. That is, officials observing the opportunities for enrichment from corruption can exploit their positions to create more red tape, and slow down the processes even further (Banerjee et al., 2012). Macroeconomic evidence generally does not support the notion that corruption can promote economic development (Méon and Sekkat, 2005, Mauro, 1995). However, there are some indications that corruption may act as an efficient grease for bureaucratic processes in settings with extremely ineffective institutions (Méon and Weill, 2010).

Definitions of corruption focusing on transgressions in the public sector, such as 'abuse of public office', ignore private-sector corruption and the roles of private agents and institutions. This leads to an implicit conclusion that reducing the state, and privatisation in particular, can lead to reduction in corruption (Carvajal, 1999). Firstly, the process of privatisation itself can provide officials with discretionary powers and lucrative opportunities for rent-seeking (Tanzi, 1998b, Rose-Ackerman, 1999). Secondly, although privatisation may reduce some types of state corruption by diminishing the economic role of the state (Hodgson and Jiang, 2007), it may not solve the problem of corruption overall. Incentives for corruption in private institutions are the same as in the public-sector counterparts (Hodgson and Jiang, 2007). Therefore, privatisation may not decrease corruption, but shift it, increasing corruption in the private sector (Rose-Ackerman and Truex, 2012).

Decentralisation may reduce corruption because citizens can monitor local officials and hold them to account more easily than their central government counterparts (Bardhan and Mookherjee, 2006). However, there is mixed evidence on the effectiveness of decentralisation as corruption deterrent, and other factors such as systems of accountability and freedom of press contribute to the success of this measure (DfID, 2015). Warner (2007) suggests that decentralisation increased, rather than reduced, corruption in the EU, by increasing demands for local party finance and bolstering the demand for bribes.

Although a review of the regulatory system and elimination of redundant or unnecessary regulations can help reduce corruption in some cases (Tanzi, 1998a), in others, it can shift the problem to another area (DfID, 2015) by providing incentives for officials to switch their rent-seeking activities away from the reformed processes to the more vulnerable regulations, providing opportunities for self-enrichment.

Deregulation can mean a removal of agencies and systems that serve the purpose of promoting public accountability, thereby reducing capabilities to control corruption (De Graaf, 2007). Similarly, taking into account the private-sector pressures to meet bottom-line demands, it is unrealistic to think that allowing the private sector to regulate itself by removing or reducing regulatory systems can lead to lower levels of corruption (Ashforth et al., 2008). Graeff and Mehlkop (2003) study the impact of economic freedom, measured by the absence of regulation, and the size of the government on corruption. Their macroeconomic analyses suggest that some restrictions of economic freedoms provide opportunities for corruption, but laws and regulations that increase transaction costs of corruption, such as anti-money laundering statutes, can reduce corruption. Additionally, in developed countries, larger, rather than smaller, governments are associated with lower levels of corruption. Therefore,

what is important is the government's ability to monitor behaviour and enforce laws and regulations rather than the size of the state.

2.4.4 Principal-agent solutions

Principal-agent theories discussed in Section 2.3.4 are influential in forming anti-corruption policy recommendations (DfID, 2015, Marquette and Peiffer, 2015, Persson et al., 2013). Such analytical approaches are concerned with increasing costs or reducing benefits of corruption for individuals, and, in particular, for public officials. Recommendations include limiting the agents' discretionary powers, preventing the monopoly of decision-making, and improving accountability (Klitgaard, 1988).

Some level of delegation and discretion is an important characteristic of agency relationships (Groenendijk, 1997, Boehm and Lambsdorff, 2009). Agents possess information not readily available to their principals, and the latter rely on the former to use their judgement in the application of rules. Discretionary powers afforded to public officials is identified as one of the necessary conditions for corruption to occur (Aidt, 2003, Rose-Ackerman, 1998). However, reduction of discretion given to lower-level officials can create a complicated rigid bureaucracy, making conduct harder to monitor, thus creating more opportunities for corruption (Tanzi, 1996). Additionally, a certain amount of autonomy is an important factor in promoting self-control and an intrinsic motivation to avoid corruption (Lange, 2008).

The size of public-sector wages can be one of the factors contributing to the problem of corruption, and this is referred to as corruption arising out of need as opposed to greed (Tanzi, 1998b). In some cases, officials' wages are kept purposefully low because of the knowledge of corrupt opportunities available to officials to supplement their wages, and their illicit earnings can be 150-1100 times their legal income (Niehaus and Sukhtankar, 2013). Where public officials are paid significantly less than their private-sector counterparts, moral costs of

corruption are thought to be lower. Using laboratory experiments, Abbink (2000) tests the hypothesis that a fair wage can reduce corruption, concluding that this would not be an effective method of combating corruption. Van Rijckeghem and Weder (2001) carry out cross-country regression analyses concluding that higher public sector wages can reduce corruption, but the increase would have to be large – at least two to eight times the manufacturing wages – to have an effect.

Besides the fairness aspect of public-sector wages, the threat of losing a position in the government in the event of being caught can, in theory, reduce corruption. In this case, outside options in terms of expected private-sector income would play a role in decision-making processes of whether to be involved in corruption. Monitoring systems are important in this respect, otherwise higher wages act as a bonus, without deterring corruption (Fjeldstad, 2003).

Dismissing corrupt officials, as also suggested by the 'bad apples' theories, may instead lead to higher levels of corruption. For example, in the case of Tanzanian taxation officials, a corruption system operated through networks, and the dismissed officials were recruited in the private sector, because of their knowledge of the taxation system, and because of their government contacts that facilitated corruption (Fjeldstad, 2003).

One of the methods to prevent the formation of corrupt networks is to introduce a geographic rotation of civil servants (Tanzi, 1996). However, this can lead to unintended consequences. Rotation can increase the influence of corrupt intermediaries, who connect the demand and supply sides of corruption (Hasker and Okten, 2008). Additionally, a new incentive for corruption is created: officials may attempt to influence their allocation, ensuring they are placed in the most lucrative areas (Fjeldstad, 2003).

Many direct interventions by anti-corruption authorities have not been successful overall (DfID, 2015). Persson et al. (2013) suggest that the reason such anti-corruption efforts fail is because these policies are based on principal-agent models with a benevolent principal, which is a mischaracterisation of the issue in cases of systemic corruption. If the principal can be assumed to be benevolent, designing institutions and systems of monitoring and punishment could be effective in reducing corruption (Aidt, 2003). However, political will and leadership is necessary for implementation of such anti-corruption policies, and the assumption that politicians do not participate in corruption and can provide such leadership may not be correct (Hopkin, 2002). In such cases of non-benevolent principals, institutions are designed in a way that provides opportunities for corruption, and any anti-corruption strategy is not implemented effectively (Aidt, 2003). Legal frameworks may even be set up to protect corruption (Kaufmann and Vicente, 2011).

Establishment of democratic institutions is one of the proposed solutions to tackle corruption where politicians are corrupt (Aidt, 2003) (democracy has also been shown to correlate with lower levels of corruption - see Section 2.3.2). If certain behaviour reduces the chances of re-election, this can steer politicians away from practices condemned by the population. For example, in Brazil, mayors eligible for re-election have been shown to misappropriate 27% less resources than those with no opportunities for re-election (Ferraz and Finan, 2011). However, the assumption that population has an incentive to punish corrupt politicians may also be incorrect (Persson et al., 2013). Where the state's function of providing for the poor and distributing public goods is undermined, individuals in positions of power may take on the role of the resource distributor through nepotism. Population may also participate in corruption by selling their votes. Corruption, then, may be better characterised as a collective action problem (further discussed in Section 2.4.7 below). Solutions would involve revolutionary changes in institutions and country leadership, with the international community playing the role of the benevolent

principal helping to establish the necessary anti-corruption controls (Persson et al., 2013).

2.4.5 Monitoring and punishment

Increasing costs or reducing benefits of corruption are the main proposed solutions offered by micro-level theories and models (see Section 2.3.4). As discussed in the previous section, establishing systems of monitoring and punishment to prevent corruption requires political will and leadership. Where this was successfully achieved, these interventions have been among the more successful anti-corruption measures (DfID, 2015, Olken, 2007).

Monitoring and punishment of corrupt agents, both in the public and the private sector is one of the most direct interventions in anti-corruption policy, and an increase in penalties is one of the more intuitive solutions to corruption (Tanzi, 1996). The sizes of fines should be linked to payoffs received through corruption to have a deterrent effect. However, as with many other interventions, there are potential negative consequences of increased penalties. A high fixed penalty and increased monitoring may reduce the incidence of corruption, but can increase the size of bribes demanded to compensate for the higher risks involved in corruption (Rose-Ackerman, 2010b). Monitoring and punishment can also have a potential negative effect of crowding out intrinsic motivations and undermining incentives to self-monitor and behave ethically (Akerlof and Dickens, 1982, Frey and Jegen, 2001).

Nonetheless, audits can be an effective deterrent. In Indonesian road projects, increasing the probability of an audit from 4% to 100% reduced corruption by 30% (Olken, 2007). In 2015, UK's Department for International Development assessed the evidence on the effectiveness of anti-corruption measures (DfID, 2015) and found that Public Financial Management (PFM) reforms such as strong central budget planning, and improved oversight, monitoring and transparency in procurement systems were effective overall.

Specific PFM measures varied in their impact on corruption and using a combination of methods was more effective than applying any single type of intervention by itself. Public expenditure tracking is among the most effective PFM measures of reducing corruption. On the other hand, effectiveness of PFM's revenue and customs systems reforms is contested. Political leadership and will is an important factor for the success of anti-corruption measures, and in countries like Afghanistan PFM measures were not successful.

When using audits to reduce corruption, it is important to bear in mind the potential displacement of corruption and the temporary effects of one-off interventions. Because different types of corruption can be substitutes, monitoring of one public-service function can reduce corruption in this area, but shift it to another (Niehaus and Sukhtankar, 2013). Effects of monitoring on corruption are also likely to be short-lived, with corruption levels returning to previous levels once the audit process finishes.

2.4.6   Organisational controls solutions

Organisational controls solutions stem from the meso-level theories of corruption (Section 2.3.5). The main difference between micro-level solutions and organisational controls solutions is that the first focus on individuals, whereas the second apply changes to organisational structures as a way of conditioning individuals. These proposed solutions are not as numerous as micro- and macro-level solutions discussed above, and the effectiveness of these measures is not well-assessed as evidence and application remain rare.

Lange (2008) provides a detailed assessment of organisational controls to reduce corruption. These controls are administrative, based on formal organisational anti-corruption rules and structures; and social or cultural controls, affecting beliefs, norms and values of individuals, and creating social pressure to conform. The administrative controls set out in Lange (2008) mirror and elaborate on those developed in principal-agent theories (limiting

discretionary powers, punishments, monitoring, and incentive alignment). What measures are implemented in each situation depends on the perceived causes of corrupt behaviour, and a combination of controls may need to be implemented simultaneously for effective corruption reduction.

If corruption is thought to arise from unethical behaviour and opportunism, autonomy-reducing measures are suggested. This type of measures echoes the principal-agent solution of reducing discretionary powers of officials. This can be done by bureaucratic controls of establishing formal rules, routines and policies within organisations, creating systems of audits, reviews and centralised decision-making. Alternatively, mechanisms of social controls can be established or promoted, shaping collective understanding of the organisational value systems, developing organisational norms of behaviour, with collective social monitoring and sanctioning.

Where corruption is thought to arise from individual responses to anticipated consequences of their actions, organisations can establish internal systems of rewards and punishments. Punishment systems rely on monitoring to detect undesirable behaviour. The incentive alignment method rewards desirable behaviour through, for example, linking employee financial compensation to company performance. Although this may discourage OCI-type corruption, it can create perverse incentives to engage in corruption on behalf of the organisation, giving rise to CO-type corruption (Pinto et al., 2008) (see Section 2.3.5).

A related but distinct type of controls is environmental sanctioning that originates externally from the organisation. In this case, organisations operate in a certain social, normative or regulatory environment, and the expectations of acceptable organisational behaviour permeate through organisational culture and affect individual behaviour. Legal or regulatory sanctions can be directed at individuals or whole organisations. Social sanctions can work through reputation-building, and groups or unions the organisation belongs to

can express disapproval or even break links with the organisation or individuals implicated in unethical behaviour.

One of the mechanisms not adequately captured in principal-agent modelling, and in economics in general, is how intrinsic motivation may prevent corrupt behaviour. That is, ethical behaviour can be adopted because it is thought to be correct and is valued by individuals for its own sake. Individuals observe organisational or wider societal values and beliefs and internalise or adopt them as their own if individuals agree with them and consider them to be right. Unlike all the measures and controls discussed above, which originate from organisational or societal pressures through constraints and external reward and punishment systems, positive behaviour based on intrinsic motivations requires a certain amount of autonomy. Extensive monitoring or punishment systems can undermine (or 'crowd out') intrinsic motivation to self-monitor and act according to ethical values (Akerlof and Dickens, 1982, Frey and Jegen, 2001).

If an organisation wishes to maintain anti-corruption values and promote self-controls against corruption, it can do so through the process of selection, employing individuals with internalised ethical values, and carry out training, communicating organisational values and reinforcing expected behaviour via praise. However, if an organisation has a pre-existing corrupt culture, vigilance controls would be required. Individuals should be encouraged to exercise 'constructive deviance' by reporting corruption. This would require individuals to break away from the established corrupt group pressures for conformity with corrupt norms. This, again, can be done by education and training, and supporting whistle-blowers.

2.4.7   Collective action solutions

Collective action theory has not been extensively applied to corruption. This section outlines the few insights the theory offers on the subject. The theory

deals with ways of coordinating actions of individuals in a group to bring about a better outcome overall. Although collective action and its proposed solutions to corruption can be generally placed within the meso-level category of theories, it also incorporates macro-level variables such as cultural embeddedness discussed in Section 2.3.3.

Collective action methods of corruption reduction advocate shifts in cultural aspects of corrupt societies, involving changes in interpersonal relationships through trust and reciprocity. Two types of trust are recognised to be associated with differing levels of corruption (Warren, 2004). Generalised trust is the propensity to trust strangers, including individuals from social groups other than their own. Societies characterised by high levels of generalised trust tend to promote inclusiveness within civil society and higher equity of access to resources.

Particularised trust, on the other hand, is characterised by distrust of strangers, and relies on group affiliations, such as religion or ethnicity, for cues about who can be trusted. Particularised reciprocity maintains resources within groups, by encouraging exchanges within associations (Warren, 2004). Societies with high generalised trust are associated with lower levels of corruption, whereas particularised trust is associated with higher corruption, and restricted access to resources and order (Warren, 2004, Persson et al., 2013). Shift from particularism to universalism, and the use of both formal (monitoring and sanctions) and informal mechanisms (reciprocity and trust) therefore, are thought to promote transitions out of corrupt vicious cycles (Persson et al., 2013).

An example of collective action solutions is Transparency International's Integrity Pacts involving formal agreements between governments and private companies to refrain from corruption (Marquette and Peiffer, 2015). Such agreements are based on trust and collective monitoring and rely on transparency of systems. Media and civil society organisations are important

for providing means of oversight of government activity and monitoring of companies' compliance with the pacts (Rose-Ackerman, 2010a). Although experimental data from the field of psychology suggests that awareness campaigns (also proposed in macro-level studies – Section 2.3.3) and publicising negative consequences of corruption may not be effective in deterring officials from corruption (Abbink et al., 2002), it can be an important tool in motivating public engagement and collective action against corruption. There is evidence that social accountability mechanisms can be effective in reducing corruption (DfID, 2015).

2.5 Conclusions

This chapter reviewed a broad range of literature on corruption, covering its definitions, types, models, and solutions proposed to fight it. Corruption can take many different forms, which makes it difficult to settle on one all-encompassing definition. Efforts to define corruption have been focused on the conduct of public officials, largely ignoring the bribe-givers, their motivations and actions. Even then, there is no single established and defined set of actions by a public official that is understood as corruption.

Factors contributing to corruption are often analysed in isolation from each other, and from the wider societal or cultural context. The mechanisms of how different factors contribute to corruption are rarely examined. The proposed methods of reducing corruption, consequently, may be dealing with the symptoms rather than the causes of corruption and the more general solutions such as reducing the size of the public sector may be displacing the problem and increasing corruption in the private sector.

There is a wide array of theorised causes of corruption across disciplines. Causes of corruption are analysed at individual (micro), societal (macro) or organisational (meso) levels. Whereas there is an abundance of analyses

focusing on macro- and micro-level causes, organisational-level models of corruption are less prevalent and the applications of theories of group behaviour (collective action) to corruption remain underexplored.

The next chapter identifies and discusses the gaps in knowledge in the field of corruption based on the review of literature in this chapter. It sets out the research questions of this thesis, refining the more general aims outlined in Chapter 1. Chapter 3 also discusses possible methods of tackling these research questions and sets out the approach adopted in this thesis.

3 Research questions and methods

3.1 Introduction

The literature review in Chapter 2 revealed several areas which have been underexplored in past research. Section 3.2 in this chapter discusses these gaps in knowledge and develops three research questions for this thesis.

Section 3.3 outlines the methods used in previous research of corruption, extending the discussion of studies covered in Section 2.3. Section 3.4 then discusses these methods and explains the methods selected to tackle the research questions of this thesis. Section 3.5 concludes.

3.2 Research questions

Chapter 2 showed that past literature on corruption focused on the role played by the bribe-takers, usually thought to be the corrupt public officials. This is especially prevalent in the efforts to define corruption. Actions and motivations of the bribe-givers have received less attention. This is the first research gap identified.

As outlined in Section 1.3, the ultimate motivations for infrastructure companies to engage in corruption can be to maximise profits and to increase the chances of obtaining projects. However, there is limited understanding of how these companies achieve their objectives.

Several past studies have provided insights such as how power networks can help organise corrupt exchanges (Carvajal, 1999); how different types of incentives, including guaranteeing a loan, can be offered in exchange for a desired outcome (Boehm and Lambsdorff, 2009, Cartier–Bresson, 1997); and how corrupt agreements have their own identifiable steps and rules of

negotiation (Boehm and Lambsdorff, 2009). However, such studies remain few in numbers, and the strategies that the bribe-givers may use to achieve their objectives remain underexplored.

When a bribe-giver attempts to establish a corrupt agreement, they may face an outright rejection, or opportunism from the side of the official. That is, the official may accept the bribe, but provide nothing in return. Therefore, to achieve its ultimate objectives through corrupt means, the company must first establish a successful corrupt exchange. A better understanding of the strategies used by the bribe-givers to establish corrupt agreements can help in the development of new methods of corruption detection and, ultimately, can contribute to corruption reduction. Therefore, the first research question this thesis addresses is:

What strategies do bribe-givers use to achieve successful corrupt agreements?

The second area that remains underexplored is how corruption is affected by the context in which it occurs. Corrupt behaviour is often analysed in isolation from its social or cultural contexts. This is particularly prevalent among micro-level studies, but some macro-level theories also do not explore cultural or social impacts on corruption (see Section 2.3 and, in particular Figure 1).

As discussed in Section 2.4, misidentifying the causes of corruption can lead to the implementation of policies that treat the consequences rather than the causes of corruption. Such interventions might not be effective or might not produce long-lasting effects. For example, monitoring and punishment can be a successful method of corruption reduction if the problem is limited to a few 'bad apples' engaging in corruption. In the context of a widespread corrupt culture such measures are unlikely to be successful.

Individual choices and behaviour in corrupt agreements, then, should be viewed in the context of the organisational culture, moral values and the wider societal norms. This is particularly important in understanding the choices of the bribe-taking officials. As outlined in Chapter 1, it is not clear whether officials awarding contracts to the less-competent companies in exchange for bribes are aware of the potential negative consequences for the economy and the dangers for the population, and how this affects their decisions. Additionally, as discussed in Section 2.2.2, attitudes towards corruption vary across political cultures, and the same corrupt actions can evoke different levels of condemnation from the public. Understanding if and how this affects the choices of the officials can provide new avenues of policy-making aimed at corruption reduction. The second research question of this thesis, therefore, is:

How do social norms affect bribe-takers' choices?

The third research gap is around sector-specific characteristics of corruption. Past research often does not identify factors contributing to corruption specific to a particular sector of the economy. Corruption is often discussed in general terms, without references to any specific activity. However, choices of individuals and the way the corrupt operate can be context-specific.

As set out in Chapter 1, this thesis aims to develop a broader concept of corruption to understand the phenomenon and how individuals make decisions in corrupt agreements. This concept of corruption is then applied to corruption at the tendering phase of infrastructure projects, where projects deliver capital goods or physical assets such as energy distribution grids. The aim, therefore, is to focus on specific aspects of infrastructure procurement.

Corruption at earlier phases of infrastructure projects can lead to corruption at later phases, and focusing on a specific phase can provide insights relevant to the entire project cycle and to the sector as a whole. Therefore, the third

question this thesis addresses is kept relatively broad, but with a focus on a specific sector:

What are the characteristics of corruption specific to the infrastructure sector and what measures of corruption reduction can be effective in this sector?

The next section discusses methods used in past studies of corruption, and the following section sets out the methods chosen for this thesis to address the above questions.

3.3   Methods used in previous research

Sections 2.3 and 2.4 reviewed cross-disciplinary theories and models of corruption in previous research, with the focus on the theorised underlying causes of corruption and the proposed solutions for corruption reduction. This section revisits these studies and focuses on the core methods used.

At micro, or individual level of analysis, corruption is analysed using predominantly rational-choice-based models, such as rent-seeking, principal-agent and game theory. At macro level of analysis, the economic general equilibrium model and econometric techniques are applied. Insights from psychology and political science are also used to develop macro-level theories and models, and econometric techniques are used to test the insights of these studies. Organisational, or meso-level studies are based in sociology, but also draw from other disciplines, and provide a wider view, or 'conceptualisations' of corruption.

In addition, several studies not covered in Chapter 2 use computational methods such as social simulation and agent-based modelling. These models are based on sets of assumptions about the underlying causes of corruption, and the models developed then formally represent the mechanisms that bring

about corruption. Computational models can be used to analyse social phenomena at any level. These methods are discussed in more detail below.

Rent-seeking models of corruption such as Cadot (1987), Rasmusen and Ramseyer (1994), Niehaus and Sukhtankar (2013) analyse strategies aimed at increasing an individual's or a company's share of the available resource or wealth. These economic models represent agents as payoff-maximising. Principal-agent models (Groenendijk, 1997, Aidt, 2003, Lui, 1986) are an extension of rent-seeking models, with an introduction of a principal looking to align the objectives of the (corrupt) agents with those of the principal (see Section 2.3.4). Both rent-seeking and principal-agent models focus on the choices of bribe-takers, largely ignoring those of bribe-givers.

Game theory models offer another method of studying strategies of payoff-maximising individuals. However, such models allow the representation of potential strategies of bribe-givers as well as bribe-takers. Models such as Bayar (2005), Bayar (2009), Uribe (2012) analyse bribe-givers' strategies by combining economic game theory with network theory (a theory that an individual's position in a social network determines their constraints and opportunities (Borgatti et al., 2013)). Social network analysis can be used to describe network structures, how network links are created and how information or goods travel through a network (Borgatti et al., 2013).

Queuing (Lui, 1985, Kleinrock, 1967) and bidding (Beck and Maher, 1986) models of corruption analyse the problem at macro level, using the economic general equilibrium theory. They represent corruption as a market with its own supply and demand for corrupt services. An equilibrium is achieved where the supply meets the demand, and the equilibrium price (the bribe size) is determined. Such models are concerned with the overall system efficiency rather than with how individuals make decisions.

Econometric techniques such as cross-country regression analyses provide insights into the types of macroeconomic variables (such as socio-political stability and independent judiciary (Seldadyo and De Haan, 2005, Park, 2003)) that correlate with low levels of corruption. These studies generally do not set out the exact mechanisms of how different factors cause corrupt behaviour, and also do not provide insights into how individuals make decisions in corrupt agreements.

Regression analyses can also be used to analyse the effectiveness of major anti-corruption programs, comparing the levels of corruption before and after the interventions. The key weakness of this approach lies in the measures of corruption used. Corruption perceptions indexes are weak proxies for the actual levels of corruption (Kenny, 2006, Olken, 2009) (see also Section 2.3.2).

Additionally, regression methods are used to test the validity of theories and models of corruption. For example, Uslaner (2010) tests insights on the causes of corruption from the field of political science using regression analyses. Licht et al. (2007) build on the insights from psychology on value orientations and cultural norms to develop a theory that clashing moral values cause corruption. This theory is then tested using regressions on macro-level data. Although the clashing moral values theory offers insights relevant to the research questions of this thesis, this theory does not focus on the exact mechanisms of how individual decision making is guided by the conflicting norms.

Chugh (2012) also draws from the field of psychology to develop a learning principles model of how corrupt behaviour is learnt through the process of socialisation. Although this model considers environmental causes of the individual predisposition to corruption (such as the pre-existing widespread corruption), the proposed solutions do not tackle the wider environmental causes directly, but instead focus on individual-level sanctioning and systems of rewards.

Corruption studies such as Pinto et al. (2008), Lange (2008) draw from a number of disciplines to develop integrative multidimensional conceptualisations of organisational or meso-level corruption. These studies use previous research to set out the various antecedents of corruption, such as the structure of an industry and societal norms, and outline the mechanisms of how different factors bring about corruption. These studies also consider different types of corruption, and the various causes underlying each type (discussed in Section 2.3.5). The resulting conceptualisations benefit from the multidisciplinary perspectives on corruption.

Collier (2002) uses the institutional choice approach and applies the Institutional Analysis and Development (IAD) framework to develop a theory of the causes of corruption, and to identify social rules commonly associated with corrupt behaviour. The IAD framework is based on the idea that individual behaviour is a product of a combination of individual choices and the rules and norms of organisations and institutions (Collier, 2002). The IAD framework is an analytical tool for studying social phenomena at various levels of aggregation – at the level of individuals, groups, organisations or countries.

Turning to the sphere of computational modelling, Situngkir (2003) used agent-based modelling to simulate anti-corruption law enforcement measures. Unlike models based on the rational choice theory, agent-based models do not consider motivations for actions or interactions. Within such models, agents' actions are represented through a simple set of rules, and the sum of all actions create system-wide outcomes. Therefore, agent-based models are better suited for analysing how interactions between individuals result in different social outcomes rather than how individuals make decisions and form strategies (Hedström, 2005).

Voinea (2013) developed the Corruption Emergence Model, a social simulation model that takes into account social norms and values such as fairness and honesty and analyses attitude changes as mechanisms of corruption creation.

Social simulation models have been used to analyse social phenomena and to understand, explain or predict behaviour. This type of modelling can be used as a method of theory development and refinement or to observe behaviour as an output of a model based on a set of assumptions (Gilbert and Troitzsch, 2005).

3.4   Discussion and choice of methods

This thesis seeks to develop a broad concept of how individuals make decisions leading to corruption, and then apply it to a specific setting, the tendering phase of infrastructure procurement (see Section 1.3). Based on the identified research gaps, Section 3.2 specified three research questions. This thesis looks to contribute towards the understanding of the strategies used by bribe-givers; how social norms affect bribe-takers' choices; and the characteristics of corruption specific to the infrastructure sector. The key purpose of this work is to offer insights into potential methods of corruption reduction in this sector.

The specific focus of this thesis is on the tendering phase of infrastructure projects. Corruption at this phase can take different forms, and can be aimed at, for example, the manipulation of tendering procedures or passing the pre-qualification criteria (GIACC, 2008). The underlying causes of corruption can vary across the different forms. The case studies that the concept of corruption developed in this thesis is applied to might reveal specific types of corruption in infrastructure bidding processes, and the concept should be flexible to allow for the underlying causes to be analysed and determined through the process of case study analysis. Therefore, it is important that the approach used to develop the concept allows the consideration of different types of corruption causes, at different levels, micro, macro and meso.

The micro and macro-level studies discussed in Section 3.3 tend to either analyse corruption in general terms, or to focus on a particular type of corruption. The use of the general notion of corruption is particularly prevalent among macro-level studies and studies in psychology analysing the general individual predisposition to corruption. Micro-level studies using rent-seeking, principal-agent and game theory techniques tend to select a specific setting and type of corruption for the analysis. This is because analysing specific interactions and behaviour requires focus on a discrete set of assumptions.

Meso or organisational-level studies, on the other hand, recognise the different types and manifestations of corruption. Despite focusing on the causes of corruption and the methods of corruption reduction at the organisational level, these studies recognise that different factors, including individual bad character can cause corruption. Organisational-level studies are not confined to a specific discipline, and benefit from a wider view afforded by drawing from multiple past studies across different disciplines.

Organisational-level studies are also well-suited for analysing norms and how they affect behaviour because they focus on the context of organisations, their rules and how these affect individual choices. Therefore, this thesis looks to follow this approach of organisational-level studies in developing a concept of corrupt behaviour.

The Institutional Analysis and Development (IAD) framework used by Collier (2002) is a specific tool that facilitates the collection and organisation of key components of social phenomena and identifying the links between these components. The framework is flexible, and allows the analysis to be carried out at any level – micro, meso or macro. The basis of this framework, that individual behaviour is driven by both individual choices and the constraints, norms and rules of organisations, is particularly well-suited to the research questions of this thesis. This is because the first question of the thesis focuses

on individual choices and strategies, and the second question turns attention to the norms and how they affect behaviour.

Therefore, the IAD framework is selected for the development of the general conception of corrupt behaviour in this thesis. This involves drawing from different disciplines and identifying the key components of corruption. The resulting concept of corruption is then used to address the three research questions. The focus of this work is to identify the actions and the decisions relevant to the establishment of corrupt agreements.

The first two research questions focus on the specific choices and strategies of individuals in corrupt agreements. Therefore, they belong at the micro level of analysis. The concept of corruption developed at the organisational level using the IAD framework, therefore, will be used in this thesis to then zoom in on a specific context, to develop micro-level models.

The summary of past studies and their methods in Section 3.3 shows that economics offers a number of tools to study individual choices and strategies. Because the first question of this thesis addresses the strategies used by bribe-givers, economic tools are appropriate for answering this question. Models such as rent-seeking, principal-agent and game-theory come from the field of economics and allow the study of behaviour driven by autonomous decision making. Unlike the rent-seeking and the principal-agent models which analyse the bribe-takers' choices, game theory methods have been used to focus on the choices of bribe-givers (Uribe, 2012, Bayar, 2009, Bayar, 2005).

As discussed in Section 2.3.4, however, the rational-choice assumptions of welfare-maximising agents may not be applicable to every setting, and other motivations may drive behaviour. Hence, in developing a model of the bribe-givers' decision making, game theory methods are used, but the welfare-maximising assumptions are relaxed, to allow for the analysis of different motivations and objectives.

The second question of the thesis focuses on how norms affect the bribe-takers' choices. Economic game theory models have not been widely applied to study social norms and economic tools in general may provide only limited insights into how norms affect behaviour.

Psychology and sociology, on the other hand, offer the relevant tools and methods to analyse behaviour where social norms are thought to guide the choices of individuals. The clashing moral values theory, the theories of organisational corruption and the application of the institutional choice approach outlined in Section 3.3 provide insights into how norms and values can determine individual behaviour and the outcomes of such behaviour. These studies, however, represent individuals as possessing a limited amount of autonomy in their decisions and choices. The second question of this thesis, however, looks to address both how individual make choices, and how these choices are framed by norms.

Voinea (2013) shows that social simulation models are suitable for analysing social norms and how they shape behaviour. Unlike agent-based models that focus on the system-wide outcomes, social simulation models can be used to study individual decision making. This method, therefore, can be used for both analysing the decision-making of autonomous agents, and representing norms and organisational rules that frame behaviour. Therefore, the second question of this thesis is addressed using social simulation methods.

The third question deals with the application of the general concept of corruption to infrastructure procurement. The research questions in this thesis are addressed at meso level (for the development of the concept of corruption) and at micro level (for the models of behaviour). Therefore, methods such as regressions on macro-level data are unlikely to provide the relevant insights. There is a lack of datasets on corruption at micro or organisational levels due to the clandestine nature of corruption and the particular lack of transparency of the infrastructure sector (as outlined in Chapter 1).

Criminal court case materials submitted in support of prosecutions under the United States' Foreign Corrupt Practices Act (1977) are published online and are accessible to the public free of charge[2]. These materials offer detailed accounts of corruption cases and provide valuable insights into specific instances of corruption in different industries across the world. These materials are chosen as the data source for this thesis and are used to develop case studies. The general concept of corruption developed in this thesis is then applied to these case studies.

To summarise, this thesis looks to address the research questions by first creating a broad concept of corruption at the organisational level, and then applying this concept to the specific questions at the micro level, in the context of infrastructure procurement. The methods chosen are the IAD framework, game theory and social simulation. These methods have been shown in past literature to be particularly applicable to the types of questions that this thesis looks to address.

There is a certain amount of path dependence in the choice of methods, and other methods that have not yet been applied to corruption could have been appropriate. This, however, can bear greater risks of the methods not yielding useful insights or not answering the research questions. Therefore, methods that have been used in past corruption research are chosen, but with a careful consideration of the suitability of each one for the precise questions of the thesis.

---

[2] Foreign Corrupt Practices Act. Related Enforcement Actions
https://www.justice.gov/criminal-fraud/related-enforcement-actions

3.5 Conclusions

This chapter identified research gaps in past literature and set out three research questions for this thesis:

What strategies do bribe-givers use to achieve successful corrupt agreements?

How do social norms affect bribe-takers' choices?

What are the characteristics of corruption specific to the infrastructure sector and what measures of corruption reduction can be effective in this sector?

Section 3.3 then outlined the methods used in past studies and Section 3.4 identified the methods for this thesis. The general concept of corrupt behaviour is developed in this thesis at the organisational level of study. The Institutional Analysis and Development framework is used to organise and link the key components of corruption and two models are then developed. The first is a game theory model focusing on the strategies the bribe-givers use to achieve successful corrupt agreements. The second is a social simulation model that considers how social norms affect the bribe-takers' decisions. Finally, case studies of corruption in the tendering phase of infrastructure projects are analysed to understand how corrupt networks are established, and what factors contribute to corruption.

4 IAD framework and its application to corruption

4.1 Introduction

As discussed in Chapter 3, this thesis seeks to develop a broader concept of corruption within which specific aspects of corrupt behaviour can be analysed. The concept is then used to develop two models of corrupt behaviour, and is applied to case studies of corruption at the tendering phase of infrastructure projects.

The specific analytical tool chosen for the development of the broad concept of corruption is the Institutional Analysis and Development (IAD) framework. It consists of a comprehensive set of building blocks that can be used to parse and analyse social interactions. Section 4.2 of this chapter summarises the key features of the IAD framework, and it is then applied to corruption in Section 4.3.

4.2 Summary of the IAD framework

The Institutional Analysis and Development (IAD) framework was developed by Elinor Ostrom (Ostrom, 2011, Ostrom, 2005) to analyse collective action problems. It is a versatile analytical tool for studying a wide variety of social phenomena. Applications of the IAD framework have mainly been focused on analysing natural resource allocation institutions, and, in particular, developing sustainable management of common-pool resources such as rivers (Heikkila et al., 2011), forests (Mattor and Cheng, 2015) and fisheries (Mulazzani et al., 2013). However, the framework has also found its applications in areas such as interactions within households (Doss and Meinzen-Dick, 2015), institutional rules underlying city charters (Feiock et al., 2016) and investment in waterway transportation infrastructure (Hijdra et al., 2015).

The framework's key strength is in specifying and systematically analysing all relevant variables in a methodologically rigorous, but flexible manner. Its rigour lies in specifying the components common to many social situations and typifying the variables for each one in a clear and self-contained way. Its flexibility is in allowing the analyst to organise a study in as detailed or as general a way as is necessary for the analysis, depending on the phenomenon studied. The framework is a multi-tier conceptual map with each component nested within a wider or more general concept.

The terms in the IAD framework have undergone changes through the years of development. For example, the term "action arena" was used in earlier representations of the framework, but was later abandoned (see Ostrom (2011, p. 9) for more information on "action arena" and why it was abandoned). In earlier works, Ostrom refers to individuals as "participants" (Ostrom, 2005), whereas in later publications they are referred to as "actors" (Ostrom, 2011). The summary in this section uses the more recent versions of the IAD framework's terms and concepts, drawing, in particular, from the 2011 special issue publications on the IAD framework (the Policy Studies Journal Volume 39, Issue 1).

For the purposes of the IAD framework, the term 'institution' is defined broadly: it is "the prescriptions that humans use to organize all forms of repetitive and structured interactions" (Ostrom, 2005, p.3). In this sense, 'institution' encompasses not only formal organisations or establishments, but also markets, social relationships, and communities. Prescriptions refer to norms of behaviour, rules and strategies shared by individuals within institutions (Ostrom, 2010).

According to Ostrom (2011), to investigate any social phenomenon, three analytical tools can be used: frameworks, theories, and models. Frameworks help to identify and organise the most general components or variables of the phenomenon studied. A theory is then developed by focusing on a subset of

these variables and making assumptions about causal relationships between them. Finally, a model presents a set of formal functional relationships between a limited set of variables, and creates predictions of outcomes.

Blomquist and deLeon (2011) offer a set of initial steps for applying the IAD framework. First, the social phenomenon requires a working definition to identify its main components: actors, and the setting. Second, the scale of the problem should be ascertained. This aids in determining the level of aggregation of individual units. That is, the phenomenon may involve interactions between individuals, groups, firms, or countries. Third, the timescales and the level of enquiry or action are chosen. In IAD framework applications, most social phenomena can be analysed at three levels of enquiry, separated by the types of activities involved: operational, collective-choice, and constitutional (Ostrom, 2005, pp. 58-62).

Operational-level activities involve practical everyday decisions, such as allocation and consumption of resources. In the IAD framework, these activities are governed by operational rules. These rules may, for example, dictate how resources are allocated across groups or individuals. Formulation of such rules is carried out through the process of collective-choice activities, which are concerned with construction of institutions and rule development. Collective-choice activities are governed by collective-choice rules, defining who is eligible to participate in the processes of establishing institutions. These rules, in turn, are a product of constitutional activities. Additionally, there are metaconstitutional activities concerned with developing rules governing the constitutional level of activities, but, for the purposes of analysing most social phenomena, three levels are sufficient.

Figure 2 summarises the IAD framework's levels of enquiry. Generally, timescales increase as we move from operational-level to constitutional activities, because the processes of, for example, defining the governmental

makeup, or formulation of policy take longer periods of time than routine policy implementation.


```
Constitutional activities        Defining who is eligible to
                                 participate in establishing
                                 institutions
         |
      output
         |
         v
Collective-choice rules
         |
      input
         |
         v
Collective-choice               Construction of institutions
activities                       and rule development
         |
      output
         |
         v
Operational rules
         |
      input
         |
         v
Operational activities           Practical everyday
                                 decisions
```
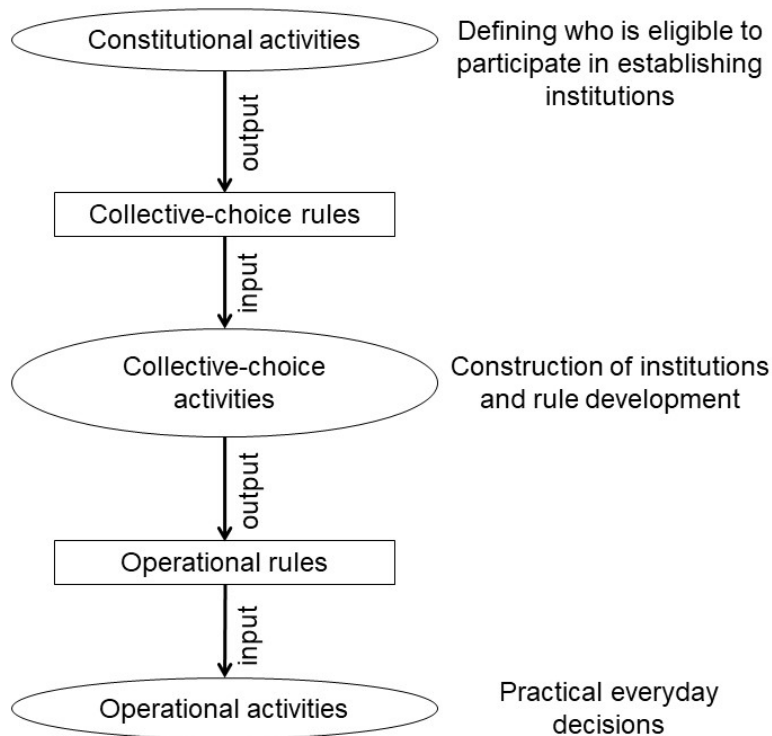
Figure 2 The IAD framework levels of enquiry. Simplified diagram, based on Figure 2.3 in Ostrom (2005, p. 59)

The core unit of analysis in the IAD framework is termed "action situation". It characterises interactions under analysis and contains seven components common to most social phenomena. For each social phenomenon, there is a number of participating actors (component 1), with their attributes. Actors can represent individuals or groups, and their attributes include characteristics such as age, gender, ethnic or cultural background, knowledge and skills. Actors occupy positions (component 2) such as those of an employee of an organisation, or a social network member. In principal-agent theories, the relevant positions are those of a principal and an agent, and sometimes a

monitoring entity, or a supervisor. This separation between an actor and a position is important because an actor can occupy a number of positions, and action choices may be guided by different and even conflicting rules prescribed by various positions.

Actors make choices over sets of available actions (component 3) that lead to potential outcomes (component 4). Each outcome, in turn, is characterised by costs and benefits (component 5) for the actor undertaking the actions, and other actors in the given action situation. Actors have different levels of control (component 6) over how their actions lead to potential outcomes, and may not possess full information (component 7) about how their actions bring about alternative outcomes. For example, in situations of resource allocation, an actor may have control over what proportion of the overall pool of resources is allocated to a particular group, but no control over the distributions of these resources within the group. In cases of investment, an actor can entrust funds to an organisation, but may have incomplete information about how this investment may be used, and, therefore, has limited knowledge of how or whether this decision to invest will lead to an outcome of increased returns over the initial investment. The seven components, therefore, are as follows:

1. Actors

2. Positions

3. Actions

4. Outcomes

5. Costs and benefits

6. Control

7. Information

There are several external variables that act as inputs into an action situation. These are attributes of the community under consideration, the nature of goods or resources involved (termed 'the biophysical conditions' in the IAD framework), and sets of rules applied in action situations. Attributes of the community provide a social or cultural context within which interactions occur. There are seven sets of rules, each set governing one of the seven components of an action situation (see Figure 3 for the links between the sets of rules and the components of an action situation):

1. Boundary rules set out who can participate in an action situation, and define conditions for entering or leaving it

2. Position rules define how an actor takes up a position within an action situation

3. Choice rules identify sets of actions available to each actor

4. Scope rules set out potential outcomes of available actions

5. Payoff rules define costs and benefits for each actor in different outcomes

6. Aggregation rules determine levels of control afforded to actors in their positions

7. Information rules identify information possessed by each actor and how it is shared between actors.
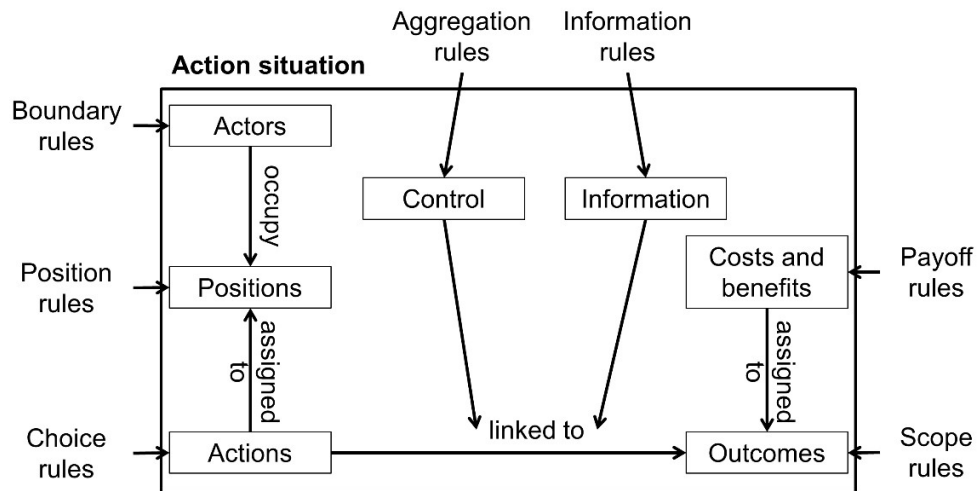
Figure 3 Structure of an action situation. Based on Figure 7.1 in Ostrom (2005, p. 189)

Outcomes can be evaluated according to a number of criteria, such as economic efficiency, i.e. whether resources are allocated in such a way as to maximise the overall benefit. Alternatively, evaluations can focus on whether resources are allocated to meet distributional equity criteria, to satisfactorily provide for the poorest groups. Furthermore, evaluations can be done on the basis of fiscal equivalence, ensuring that every individual's contribution to the common pool of resources is equal to the benefits derived by that individual.

The above criteria (efficiency, equity and fiscal equivalence) can be used to evaluate states of the world resulting from action situations. The relevant outcomes can also include the set of actions taken, and these can be assessed against the criteria of legitimacy, accountability or conformance to norms or values of the community.

Through the process of outcome evaluation, the analyst establishes whether the chosen criteria are met, and whether institutional changes are required to

improve the outcomes of institutional processes and interactions in the future. All the relevant criteria may not be met simultaneously, and trade-offs are necessary in designing institutions and proposing changes to improve the performance of institutions. Table 2 summarises some of the key evaluation criteria used in the IAD framework.

Table 2 Criteria for outcome evaluation. Summary based on texts in Ostrom (2005, pp. 66-67), McGinnis (2011) and Ostrom (2011).

Evaluation criteria	Description
Economic efficiency (allocative efficiency)	Broadly, allocation of resources is efficient if it maximises the net benefit from these resources and minimises waste
Fiscal equivalence	Each individual's benefit from a common resource is either equal to their contribution towards it, or is based on their ability to pay for it
Equity	Distribution of resources to provide for the poorest groups
Sustainability (adaptability, resilience, and robustness)	Flexibility of systems to cope with, and respond to the changing environment
Accountability	The extent to which decision-makers can be held responsible for their actions
Conformance to general morality/ values of local actors	The extent to which actions of decision-makers meet the commonly held norms and values
Legitimacy	The extent to which actions or outcomes conform to legal or normative rules

What is common to most of the analyses using the IAD framework is the emphasis on improving the outcomes for all actors through collective action, or coordination of efforts to achieve a common objective. Development and

implementation of institutional changes to improve the processes and outcomes requires commitment from all actors involved in an activity.

Application of collective action theories for anti-corruption policy development is a relatively recent avenue of research (DfID, 2015, Marquette and Peiffer, 2015). Key recommendations for anti-corruption policy from this research are summarised in Section 2.4.7.

Collier (2002) presents an example of the IAD framework application to corruption. The paper offers causes of corruption based on the levels of corruption tolerance across different political cultures. Conclusions are that anti-corruption policies are likely to be met with resistance from the elite because such policies threaten to destabilise political structures and weaken the elite's position and access to power. The alternatives suggested are grass-root institutional changes and reform of political structures and cultures.

The next section applies the IAD framework to corruption, drawing from literature reviews in Chapter 2.

4.3 Application of the IAD framework to corruption

4.3.1 Overview

This section applies the IAD framework to corruption. This application is general, and looks to identify key components that are common to many cases of corruption. The concept of corruption developed in this section is then used throughout the rest of the thesis to develop two models (Chapters 5 and 6) and to analyse case studies (Chapter 7).

As discussed in Section 2.2.2, there are many types of corruption, and this section focuses on a subset involving interactions between different actors, in settings concerning allocation of some resource or benefit. The IAD framework

was originally created specifically to analyse these types of interactions. Therefore, the analysis excludes certain corruption types such as embezzlement where an individual abuses their position of power to extract benefits for themselves alone.

The section is organised as follows. Section 4.3.2 discusses the settings in which corruption occurs. There is a broad range of settings, and the analysis focuses on the types of activities that corruption can affect or disrupt. These activities are classified according to the IAD framework levels of activities – operational, collective-choice and constitutional (see Figure 2).

Section 4.3.3 identifies key positions occupied by actors in corruption action situations. The focus is on positions occupied by, on the one hand, an actor (e.g. government official) with certain decision-making powers over a process, and, on the other hand, an actor who can benefit if the decision is made in his/her favour. Additional positions are discussed in Section 4.3.5, to set out a concept for analysing corrupt exchanges involving intermediaries. At this stage, the level of aggregation is not defined, and the positions identified can be occupied by organisations, as well as individuals.

Section 4.3.4 sets out corrupt actions. A focus is made on an exchange of benefits, and a quid-pro-quo nature of corrupt agreements (discussed in Section 4.3.6). Section 4.3.7 places the components identified (positions, actions and benefits) into the setting discussed in Section 4.3.2, and Section 4.3.8 summarises.

4.3.2   Activities affected by corruption

As discussed in Section 4.2, an application of the IAD framework begins with defining the phenomenon under investigation, to ascertain the main actors and the setting (Blomquist and deLeon, 2011). However, the commonly-adopted and quoted definitions (see Section 2.2.1) are imprecise in identifying the types

of settings in which corruption occurs because there are many types and manifestations of the phenomenon (see Section 2.2.2), and it is difficult to develop an all-encompassing definition. Corruption can occur in both the public and the private sectors and can impact activities such as routine processes of resource allocation, policy development, or selection of candidates for the positions of power.

The scale of the problem is also context-dependent and can involve isolated corrupt actions of individuals in the positions of power, or coordinated actions of entire companies, organisations or governments (see also Corrupt Organisation (Pinto et al., 2008), Section 2.3.5). This multifaceted nature of corruption makes it difficult to define the general setting and the actors present in most types of corruption.

Instead, activities that constitute corruption can be set aside from activities affected by corruption, with the focus brought on the latter. Activities such as resource allocation, policy development, or selection of candidates for the positions of power each corresponds to a different level of enquiry in the IAD framework – operational, collective-choice and constitutional (Figure 2). Different manifestations and types of corruption affecting these activities can then be arranged according to these three levels of enquiry.

First, allocation of resources or some other benefit corresponds to the operational level of enquiry in the IAD framework. Henceforth, this resource or benefit will be broadly referred to as Valuable Object. This Valuable Object can take different forms, such as a driving licence, a construction contract, or a tax rebate. Corruption occurs where the allocation of a Valuable Object constitutes some form of abuse of a routine implementation or policy, and where this allocation is made for private ends through a subverted due decision-making process (see definitions 11 and 15 in Appendix A). This type of corruption is described as petty or bureaucratic (see Section 2.2.2).

Second, resource allocation processes are generally guided by a set of criteria, rules or regulations, which are developed at the collective-choice level of activities. Corruption at collective-choice level can take forms of state capture, affecting policy formation, or regulatory capture to benefit particular groups or individuals. Corruption in such cases can manifest itself as bribery of officials deciding on policy or regulation.

Third, the composition of institutions responsible for the development of policy or regulation can be affected by corruption, and this corresponds to constitutional-level activities. In this case, actors are assigned to positions of power by corrupt means, such as by bribing the electorate. Once elected, the officials can manipulate policy decisions to benefit the individuals or groups that facilitated the acquisition of power through, for example, financing the party's pre-election operations.

The types of activities that can be affected by corruption and the corresponding IAD framework levels of analysis are summarised in Table 3.

Table 3 Links between the IAD framework's levels of activities and the associated types of corruption

IAD framework's level of activities	Activities	Relevant corruption types/ manifestations
Operational	Allocation of Valuable Object	Bureaucratic/ petty corruption; Facilitation payments
Collective-choice	Development of criteria for Valuable Object allocation	Political corruption (regulatory/ state capture)
Constitutional	Defining participation in collective-choice activities	

4.3.3 General positions in activities affected by corruption

This section identifies key IAD framework positions relevant to activities that can be affected by corruption. Each position can be occupied by a single individual, groups of individuals, or by entire organisations. Therefore, the scale (i.e. the aggregation level of individual units – see Sections 4.2 and 4.3.2) is kept flexible, to be determined for each corruption case.

There are several actors who stand to benefit or bear costs as an indirect result of activities set out in Section 4.3.2. In the case of driving licence allocation, other drivers and pedestrians can face higher levels of injury risks if a driving licence is allocated to an incompetent driver. Where an IT service contract is awarded through a corrupt exchange, the owners of the service purchasing company (shareholders or investors) can bear costs if the service is too expensive, or if poor-quality IT infrastructure leads to the loss of clients and profits. Likewise, the population relies on elected politicians and appointed officials to represent their interests and develop policies accordingly. Henceforth, the group of actors who are not directly or actively involved in the three types of activities set out in Section 4.3.2, but who are affected by the decisions taken, will be referred to as Stakeholders.

There are several actors occupying positions in which they have an input into, or influence over, the activities set out in Table 3: the allocation of a Valuable Object, the development of criteria for such allocation, or the selection of actors to participate in criteria development. This type of a position is most commonly thought of as that of a public official or a politician, but can be a post in any sphere, public or private. Henceforth, this position will be referred to broadly as that of a Decision Maker (DM). DMs do not have a claim of ownership or direct control of the Valuable Object, but are entrusted to allocate it on behalf of the Stakeholders. Likewise, DMs at constitutional and collective-choice levels are expected to make decisions such as policy development in accordance with Stakeholders' interests.

DMs are expected to follow a set of rules in their decision-making processes, such as abiding by criteria set for the allocation of the Valuable Object. For example, politicians are expected to base their resource allocation decisions according to the criteria of improving the public (Stakeholders') welfare (Jain, 1998a, p.6). DMs have certain flexibility or discretion in following these criteria. This discretion is important to ensure that DMs can use their judgement and take actions that lead to better outcomes for the Stakeholders, even if not all the criteria are met. That is, the various relevant criteria may conflict, and because of the context-dependent constraints, trade-offs may be necessary. In using their discretion, DMs are expected to uphold the interests of the Stakeholders, and not take their own personal interests into consideration. In other words, DMs are expected to apply the Arms-Length Principle (ALP) (see Section 2.2.1 for definition) in their decisions. Discretionary powers afforded to the DMs are often identified in past literature as the key precondition for corruption to occur (Rose-Ackerman, 1998, Aidt, 2003) (see also Section 2.4.4).

It has been argued in past literature that a DM must have a monopolistic power over a process for corruption to occur (Jain, 1998c, Rose-Ackerman, 1998) (discussed in Sections 2.3.4 and 2.4.4). However, in cases of corruption involving legislators voting on a statute, there are a number of DMs, with no single actor having complete control over the process (Rasmusen and Ramseyer, 1994). Additionally, in settings such as allocation of permissions for tree logging, corrupt officials from different jurisdictions may compete for bribes from logging companies in return for permits for wood extraction on their sites (Burgess et al., 2012). Therefore, a monopoly power can afford DMs greater (or absolute) control over the process, but it is not a necessary condition for corruption to occur.

Additionally, in activities that can be affected by corruption, there are Candidates who stand to directly benefit as a result of favourable decisions

made by DMs. At operational level, Candidates compete for, or apply for, a Valuable Object, and stand to benefit if it is allocated to them. At collective-choice level, Candidates can benefit from, for example, laxer regulation applied to their industry. Finally, at constitutional level, Candidates compete for positions in, for example, the government, and stand to gain power if elected.

Thus, actors participating in activities that can be affected by corruption occupy three key positions: a Stakeholder, a Decision Maker and a Candidate. The position of a Stakeholder is generally passive, and actors occupying positions of DMs and Candidates take active roles.

4.3.4 Actions constituting corruption

Corruption is often thought of as an exchange involving at least two actors (Appendix A, definitions 15 and 16), occupying positions on either the demand or the supply side of corruption (Tanzi, 1998b). Where corruption occurs, DMs belong on the supply-side of corruption, providing a Candidate belonging on the demand-side of corruption with some Advantage over the process (the nature of Advantage is discussed in more detail below).

If a DM uses his/her discretionary powers in such a way that provides any of the Candidates an undue Advantage over the process or activity, and this is motivated by the DM's self-interest, this constitutes violation of the ALP, and is a Corrupt Act committed by the DM (Section 4.3.3 introduced the Arms-Length Principle as the rule guiding DMs' due decision-making processes). The nature of the undue Advantage is context-specific and can take forms of manipulation of Candidate qualification criteria or disclosure of confidential information, enabling an otherwise ineligible Candidate to compete for, and be allocated, the Valuable Object. Alternatively, an Advantage can take the form of fulfilling a routine function of the DM, which is withheld or delayed in order to extract kickbacks from Candidates. This is the case of facilitation payments type of corruption.

The key observation is that the Advantage helps the Candidate to secure the Valuable Object, but the two are separate. This separation allows the concept developed to be applied to corruption action situations that, for example, require approval of multiple DMs for the Valuable Object to be allocated to the Candidate. The nature of the Advantage from each DM can vary – for example, forging the paperwork or overlooking disqualifying characteristics. The sum of these actions leads to the Valuable Object being allocated inappropriately, with a number of Advantages being traded.

A Candidate, knowing the potential to benefit from DM's violation of the ALP, can offer the DM something of value (an Incentive) in exchange for the Advantage. This offer constitutes a Corrupt Act by the Candidate. This offer does not have to be accepted for it to constitute a Corrupt Act – attempted bribery is still bribery. The Incentive can be financial, such as a bribe, or barter in nature. That is, a Candidate may occupy the position of a DM in another action situation, where he/she has an input into decisions on, for example, allowing club membership, and can exercise his/her discretionary power to provide an undue Advantage to any Candidate. The two actors, therefore, switch their positions of a Candidate and a DM between the two action situations and each provides the other with an Advantage.

Once the offer of an Incentive has been extended, and prior to the violation of the ALP, the DM has a choice of whether to accept the offer. Accepting the offer also constitutes a Corrupt Act by the DM because it indicates the intent to violate the ALP. The actual and intentional ALP violation and provision of an undue Advantage is then a sufficient, but not a necessary condition to have committed a Corrupt Act. The order of Corrupt Acts can also vary, and corruption can be initiated by the DM or the Candidate. In cases of extortion, A DM requests a kickback in return for fulfilling his/her regular function. These variations are often reflected in anti-corruption legislation to indicate that intent is sufficient to have committed an offence of corruption.

4.3.5 Additional positions present in corrupt activities

The Incentive does not necessarily have to be given directly to the DM, but can be provided to a third-party Beneficiary. If the DM has an interest in the welfare of the Beneficiary, he/she obtains an indirect or Derived Benefit, and this motivates the DM to commit Corrupt Acts. By extension, there can be a party who is interested in the Candidate's welfare, and can commit a Corrupt Act on behalf of the Candidate. Henceforth, this party will be referred to as the Candidate's Representative. The Representative can, for example, be a company director, acting on behalf of a company in competition for a contract. If the company wins the contract, the Representative can gain a Derived Benefit from it, such as a company performance-related bonus.

Another party that can be involved in corrupt processes is an Intermediary. For the purposes of this thesis, the role of an Intermediary is defined as facilitation of corrupt exchanges. Intermediary does not necessarily have an interest in the welfare of any other actor within the corrupt action situation. The Intermediary's role is to negotiate and/or transfer the Incentive to the DM. The Intermediary is motivated by a Commission he/she receives in exchange for his/her services. If both the Commission and the Incentive are monetary, the value of the Commission is higher than the value of the Incentive, and the DM receives a proportion of the Commission transferred to the Intermediary.

In some cases, the Intermediary may receive a Commission for the services of negotiating the corrupt exchange, with the Incentive being transferred through another party. The Commission would then be kept in full by the Intermediary, as payment for negotiating services. However, it will be assumed for now that the Commission includes any disbursements the Intermediary may have to make, including providing the Incentive to the DM.

The key difference between a Representative and an Intermediary is in the level of association with the Candidate. For example, in Corrupt Organisations

(CO) (see Section 2.3.5), corrupt actions arise out of the loyalty to the organisation. Using the terms introduced in this chapter, a Representative in the case of a CO type of corruption commits a Corrupt Act for the benefit of the Candidate. The Derived Benefit for the Representative can, in this case, take the form of intrinsic rewards from fulfilling the objectives of the Candidate. Intermediaries fulfil their functions in exchange for a Commission, and they do not obtain a Derived Benefit from Candidate's improved welfare.

4.3.6 Exchanges of benefits in corrupt activities

Figure 4 summarises the various network structures of benefit transfers between corrupt actors occupying positions of a Candidate, a DM, a Beneficiary, an Intermediary and a Representative. The figure diagrammatically illustrates the descriptions of corrupt exchanges set out in Sections 4.3.4 and 4.3.5, and summarised below.

Panel A in Figure 4 shows the basic corrupt exchange discussed in Section 4.3.4 between two actors, occupying positions of a DM and a Candidate. The Candidate provides an Incentive to the DM who in return provides an Advantage to the Candidate. The exchange is carried out directly, without involving third parties. Panels B, C and D include additional positions of a Beneficiary, a Representative and an Intermediary introduced in Section 4.3.5. Panel B shows a case where a Candidate provides an Incentive to a third-party Beneficiary, with the DM deriving some indirect benefit from this. An Intermediary is added to the basic exchange in Panel C, with the Intermediary receiving a Commission and providing an Incentive to the DM on behalf of the Candidate. A Representative deriving some benefit if the Candidate obtains the Advantage is shown in Panel D. The Representative provides the Incentive to the DM in exchange for an Advantage being given to the Candidate.

At this stage, the distinction between the offer and the actual delivery of an Incentive is not made. The purpose is to illustrate the possible transfers of

benefits, with the caveat that there can be more complex systems, involving many actors, occupying the five positions. For example, the functions of Intermediaries (offer, negotiation and delivery of an Incentive) may be split between several actors. Additionally, a Representative may offer the Incentive, and, if it is a bribe, negotiate its size, but the actual transfer may be made directly from the company's (Candidate's) funds, or via an Intermediary. In this case, the Intermediary only fulfils the role of delivering the Incentive. Such detailed analysis is left to Chapter 7 (case studies).
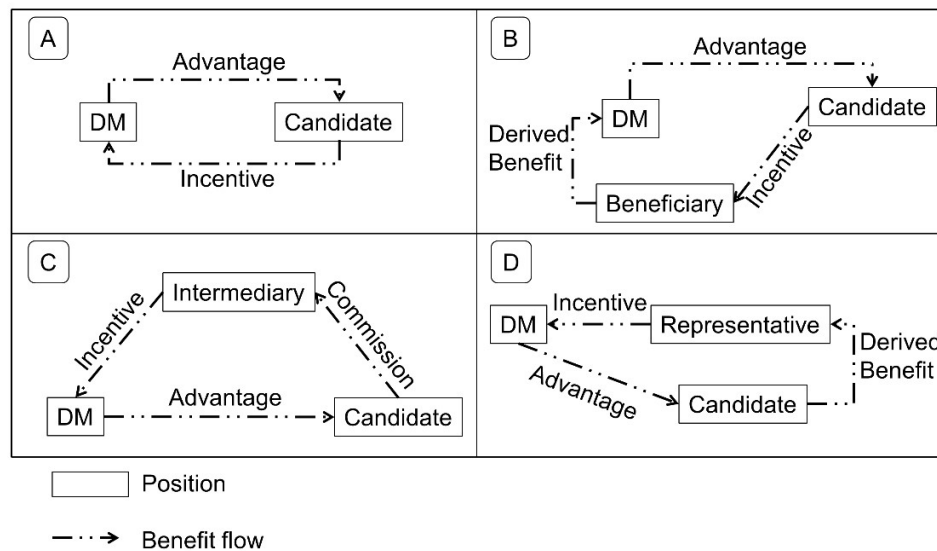
Figure 4 Flows of benefits between actors in corrupt transactions

4.3.7 Corruption phenomenon

With the key IAD framework components of corruption set out in Sections 4.3.3 to 4.3.6, this section returns to the three levels of enquiry discussed in Section 4.3.2 and places the components in the setting of activities affected by corruption.

Corruption, as a phenomenon occurring in action situations across the three levels of activities (operational, collective-choice and constitutional), can be interpreted in two ways. On the one hand, corruption at each level can take the form of independent corrupt action situations, and can be thought of as discrete separate occurrences. In this case, all basic components remain the same across the three levels (static positions, the exchange of benefits kept within the specific action situation, not extending to other action situations). For example, a constitutional-level action situation involving corruption might be concerned with selection of a Candidate for a government position. The Valuable Object in this case is the government position. Each individual voter simultaneously occupies two positions: that of a Stakeholder and that of a DM. The Advantage provided by each DM is a single vote, and winning the election and obtaining the government position is the ultimate goal of the Candidate. As a Stakeholder, the individual wishes particular policies to be implemented, and one of the Candidates may support these policies. However, as a DM, the individual may be tempted to vote for the Candidate willing to pay for the vote. Therefore, as a DM, the individual may cast their vote for the Candidate in exchange for a bribe (an Incentive). As a Stakeholder, the individual then faces consequences of undesirable policies being implemented until the next electoral period.

Similarly, at collective-choice level, an action situation could be concerned with industry regulation. Lax regulation represents the Valuable Object desired by the industry (the Candidate in this case). In exchange for the elected politicians' (DMs') support of liberal regulations, the Candidate can offer Incentives in the form of bribes.

An alternative representation of corruption as a phenomenon is made by linking action situations across the three levels. A Candidate competing for a Valuable Object at the operational level can attempt to influence the development of criteria applied in the allocation process. For example, an operational-level

Candidate can supply finance to the constitutional-level Candidate to support him/her in government elections. This finance can represent an Incentive for the constitutional-level Candidate to support laxer regulation once he/she is elected and enters the collective-action level activities.

4.3.8 Summary of corruption components

In this section, the general components of corruption action situations are identified and discussed. These components are further elaborated on and used in Chapters 5 and 6 to develop models of actors' decision-making processes in corrupt agreements. In Chapter 7, case studies are analysed by parsing the relevant factors and organising them according to the components identified.

Section 4.3.2 identified the three types of activities that can be affected by corruption: resource allocation, policy development, and selection of candidates for the positions of power.

Sections 4.3.3 to 4.3.6 then introduced the five positions occupied by actors in corruption action situations: a Decision Maker, a Candidate, a Representative, a Beneficiary and an Intermediary. Additionally, Stakeholders play a passive role in activities affected by corruption. However, Stakeholders can take on an active role in initiating institutional changes to improve the processes and outcomes, and addressing corruption.

Decision Makers are endowed with power, control, discretion or influence over an activity. In their decisions, DMs are expected to follow the ALP, and act in accordance with the interests of the Stakeholders. The level of control over activities and the ability to provide an undue Advantage that leads to Valuable Object being allocated to a particular Candidate depends on the number of DMs and the function fulfilled by each DM in the relevant activity.

There are two actions that constitute a Corrupt Act by a DM:

1. Request, agree to receive, or accept an Incentive. This Incentive can be provided directly to the DM, or to a third-party Beneficiary, in which case the DM receives a Derived Benefit.

2. Provide the Candidate with an Advantage.

An action constituting a Corrupt Act carried out by the Candidate, the Representative, or the Intermediary is to offer, promise or provide an Incentive to the DM or a third-party Beneficiary. As a result of corrupt exchanges, the Candidate receives an Advantage in an activity; the Representative obtains a Derived Benefit from the Candidate's improved welfare; and the Intermediary receives a Commission for his/her services (less the value of the Incentive passed along to the DM or a third-party Beneficiary).

5 Model 1. Triad-based corruption games under uncertainty: bribes or gifts?

5.1 Introduction

Corruption is a complex phenomenon, and its manifestations are varied in nature. What is common to most cases is the importance of trust between corrupt partners. Social network ties facilitate information exchange that fosters trust, which is an important factor in establishing and sustaining corruption. This chapter looks to address the first question of the thesis set out in Section 3.2, and explores how bribe-givers may strategically use pre-existing social network connections to improve their chances of achieving successful corrupt agreements.

In the broader sense of "institutions" the informal social institutions of social networks are important phenomena in understanding corruption. Network ties are pathways for flows of tangibles (e.g. goods) and intangibles (e.g. information, beliefs, norms, etc.) (Borgatti et al., 2013, p.3). Different types of networks allow formation of different types of beliefs about the characteristics of other individuals. As such, social network ties allow exchanging the type of information that fosters "goodwill" trust (trust that the other individual intends to perform according to agreements), whereas economic ties foster "competence" trust (trust in individual's ability to perform according to agreements) (Ferriani et al., 2013). If two individuals do not have a direct connection, they may both have an acquaintance in common (an Intermediary), creating a path for flows.

This chapter develops a game theory model of decision-making processes in corrupt agreements, linking economic and social network ties with formation of subjective probabilities over the likely actions of other actors in a corruption action situation. The decision-making processes are formulated under conditions of uncertainty. The actor is unable to assign exact cardinal

probabilities to the outcomes or events, but can assign ordinal probabilities and say which outcome is believed to be more likely to occur than another (see Four Cognitive Attitudes in Elster (2007, Ch. 7)).

A sequential game with three actors (a Decision Maker (an official), a Representative and an Intermediary) is presented. A company Representative seeks to obtain an unfair Advantage over the competitors in an infrastructure project bidding process. The Representative chooses how to frame the offer to the Decision Maker (a gift or a bribe) and the method of offer delivery (directly, or via an Intermediary).

Game theory models usually represent agents as utility- or payoff-maximising, following the assumptions of Rational Choice models. Such models largely ignore intrinsic motivations and social incentives to reciprocate or to avoid social disapproval (Fehr and Falk, 2002). As revealed by several psychological experiments, individual behaviour often deviates from payoff-maximising strategies. Participants of such experiments choose costly punishment in one-shot games that reduce both players' payoffs (Abbink et al., 2000, Lambsdorff and Frank, 2010). Hodgson and Jiang (2007) suggest that Rational Choice models may not be applicable in contexts where norms and morals play a key role in decision making. An alternative is to represent individuals as objective- or rule-driven.

Therefore, version 1 of the model proposed in this chapter explores how a company Representative makes choices over alternative means of fulfilling an objective of obtaining an Advantage for the Candidate from the DM. A corrupt offer framed as a gift can be more readily accepted by the DM than if the offer is framed as a bribe. However, the expectation of reciprocity is less apparent if the offer is framed as a gift. If an Intermediary is used, the DM may be more likely to accept a bribe. However, a successful corrupt agreement depends on whether the Intermediary can be trusted to deliver the bribe to the DM. Version 1 of the model provides an insight into the content of network connections

between the Representative and the Intermediary necessary for the latter to be trusted and employed. However, Version 1 includes parameters which are difficult to estimate and provides little insight into the choice between the gift and the bribe frames.

Version 2 of the model in this chapter is based on payoff-maximising rationale for the Candidate and focuses on the choice between the gift and the bribe frames. The assumptions made are the same as in Version 1. However, whereas the objective of the Representative in Version 1 is to maximise the likelihood of the preferred outcome without weighing up the payoffs, Version 2 introduces payoffs: the value of the contract, less the size of the bribe or the gift given to the DM. Version 2 allows the comparison of the sizes of bribes and gifts and shows that the value of the bribe is larger than the value of the gift under the model assumptions.

The chapter is structured as follows. Section 5.2 provides a review of literature and uses the same terms as in the studies reviewed, such as agent, briber, bribe-taker and intermediary. Then, from Section 5.3 on, in developing the model, the terms introduced in Chapter 4 are used. Version 1 of the model is presented in Section 5.3. Version 2 of the model is presented in Section 5.4 and Section 5.5 concludes.

5.2   Review of literature

5.2.1   Framing of a corrupt offer

In order to disguise corrupt transactions from enforcement agencies, monetary transfers can be processed under the guise of legitimate payments for services. In cases of extortion or demanded kickbacks, officials can make contract allocations to companies conditional on payments of 'fees' or 'concessions'. In the Iraqi Oil-for-Food contracts, such payments were termed "after sales service fees" and were fixed at 10% of the awarded contract value

(Independent Inquiry Committee into the United Nations Oil-For-Food Programme, 2005). In briber-initiated corruption, payments are sometimes offered as gifts, donations or loans (Boehm and Lambsdorff, 2009).

The difference between a gift and a bribe is in the framing. Bribes are generally negotiated payments (Oldenburg, 1987) with reciprocity expectations. The frame of a "gift" is more subtle. The choice of the corrupt offer frame is strategic. The responses to the survey of Norwegian firms discussed in Søreide (2007) suggest that the gift frame is sometimes used by companies competing for public contracts, and the intention behind such offers is "similar or identical" to that behind bribes. Under conditions of uncertainty over the type of an official faced (honest or corrupt), an indirect or veiled offer (i.e. a gift rather than a bribe offer) provides plausible deniability in case the person is not corrupt (Lee and Pinker, 2010).

However, the choice of a more subtle offer frame bears risks of the expectation of reciprocity not being understood as such. In the laboratory-based experimental corruption games with the choice of the corrupt offer frame (bribe or gift) left to the participants (Lambsdorff and Frank, 2010, Lambsdorff and Frank, 2011), the choice is guided by the anticipation of how the frame is received by the other person. The gift frame is perceived to be less offensive to the potential corrupt partner, but at a cost of a less apparent quid-pro-quo.

The participants of the Lambsdorff and Frank (2010) study who chose the bribe frame are thought to be more risk-loving and their choice is guided by clearer expectations of quid-pro-quo. There is also a slight tendency in the Lambsdorff and Frank (2010) study for bribe offers to be smaller in size compared to gift offers. There are no significant differences in the choices of the participants playing the roles of officials between the two frames. That is, both bribe and gift offers evoked responses of opportunism, whistleblowing and reciprocity. There is, however, a slight tendency to reciprocate more when bribed than when offered a gift.

The model presented in this chapter analyses the decision-making processes of a bribe-giver choosing how to frame a corrupt offer. The studies discussed above do not suggest that the responses of individuals playing the roles of officials can be predicted based on the frame used. However, the participants playing the roles of bribe-givers expressed beliefs that gifts are more likely to be accepted than bribes, but are less likely to be reciprocated. Therefore, these beliefs will be used to develop the bribe-giver's decision-making processes.

5.2.2 Intermediaries in corruption

In formal models of corruption, the intermediaries' role is in reducing risks associated with proposing a corrupt agreement. Lambsdorff (2002) and Hasker and Okten (2008) suggest that corrupt officials have a preference for acting via intermediaries because of the reduced risks of exposure. An official seeking to extract economic rents (bribes) can enter into an agreement with an intermediary, who then purports to provide a service to the population of cutting through the red tape and helping clients to obtain a service from the government official. In the model presented in Bayar (2009), the "service charge" is then split between the official and the intermediary. Alternatively, in corruption initiated by the "briber", the intermediary is represented as being better informed about the types of officials, whether they are likely to accept bribes, and their appropriate amounts (Bayar, 2005).

However, an experimental game of corruption with intermediaries in Drugov et al. (2014) shows that even when there is no uncertainty over the minimum bribe required to establish an agreement with an official, the number of accepted bribes when an intermediary is involved increases. This suggests a reduction in psychological costs of corruption through distancing the bribe-takers from the bribe-givers. The sizes of minimum-acceptable bribes set by participants playing the roles of officials are also somewhat smaller with an intermediary compared with the no-uncertainty setting (that is, when the minimum bribe is disclosed to the bribe-givers, with no intermediary being involved).

Despite the advantages of using intermediaries in corrupt transactions, there are some additional risks. For example, claims that intermediaries are better-informed about government officials' corruptibility through their network ties in some cases are false. Where institutions have a reputation for high levels of corruption, alleged intermediaries or middlemen can offer their services to a large number of individuals, promising to return the value of the bribe if the result is not satisfactory. In fact, the middlemen may keep the bribe, collecting a risk-free rent, as in some cases the desired outcome is achieved without any actions taken by the purported intermediary (Oldenburg, 1987). Some level of trust in the intermediary's ability and willingness to act on behalf of the briber is, therefore, necessary (Zanella, 2013).

5.2.3   Social networks and trust

There is a large and growing literature on trust in social networks. In trust games, agents' decisions on whether to place trust are determined by temporal and network embeddedness (Buskens, 2003). Temporal embeddedness refers to repeated interactions between the same pair of agents (a dyad) in a network. Such repeated interactions provide opportunities for dyadic and network learning, and control, or, in other words, punishment for breaking trust in past interactions (Buskens et al., 2010). Network embeddedness means the existence of third parties within a network, who possess information about past behaviour of agents. Information flows between agents then allow reputational sanctions by disclosing past actions (Buskens, 1998).

Because of the illegal and, therefore, clandestine nature of corruption, information channels for learning about agents' past actions are limited, if available at all. Sanction options, such as cancelling legally-obtained contracts if a company declines to pay a promised bribe, may not be exercised because of the risks of disclosure and punishment for attempted corruption. Although social networks enable the establishment of corrupt relationships lasting decades (Boehm and Lambsdorff, 2009) and taking the form of a futures

market in favours (Cartier–Bresson, 1997), it is poorly understood how social networks facilitate the development of corrupt networks.

In the absence of credible channels for information about corruptibility of an official, the briber faces an identification problem, i.e. uncertainty over the official's preferences over entering into a corrupt agreement. Strategic framing of the corrupt offer can aid in solving this problem, by sending an indirect signal such as framing the offer using innuendos hinting at a bribe (Lee and Pinker, 2010). In the presence of high risks of being reported, or bribery being detected, and facing punishment, however, using social network channels allows bribers to extricate themselves from the act of bribing, and to separate the actions of bribing and the reciprocal provision of an unfair advantage. This further reduces the risks of getting caught.

The perceived likelihood of a successful corrupt agreement made via an intermediary relies on high levels of trust in the intermediary's ability and willingness to deliver the offer. An intermediary's willingness to act on behalf of the briber, among other things, depends on how well his interests are aligned with the interests of other agents involved in the deal (the briber or the bribe-taker). Intermediaries may charge for the service of providing a channel of bribe delivery. This, however, does not ensure that the intermediary is 'honest' and actually delivers the bribe to the intended official. Intrinsic motivations are more likely to produce cooperative behaviour from intermediaries than financial incentives (Bravo et al., 2012).

The content of network ties between the briber and the intermediary is important in gauging whether the intermediary can be trusted to: 1) ensure that the bribe is accepted, and 2) not keep the money. The first requires for the briber to possess the knowledge of the level of competence of the intermediary, the second means relying on the goodwill of the intermediary towards the briber. Ferriani et al. (2013) suggest that social network (or expressive) ties allow the development of goodwill trust, whereas economic network (or

instrumental) ties create channels for information exchange that fosters competence trust. The study suggests that social ties have a stronger impact than economic ties on the development of multiplex ties (i.e. ties between individuals interacting with each other in multiple social contexts).

5.3   Model Version 1

5.3.1   Model assumptions

The setting of the model is an infrastructure procurement process. An infrastructure company competes for a project contract. This company is the Candidate, and appoints a Representative to work on the bid and win the contract. There is one Decision Maker (DM) responsible for the tendering process and allocating the contract to the best bidder. The Candidate has several competitors, and the Candidate's bid has a number of disadvantages compared to the competitors' bids. The Candidate, therefore, is unlikely to win the contract without the DM's support. The Representative is charged with securing the DM's support and ensuring that the DM provides the Candidate with an Advantage over the competitors. The Representative may use an Intermediary to deliver an Incentive (a bribe) to the DM in exchange for an Advantage for the Candidate.

Payoff structures are not considered in Version 1 of the model. The Representative evaluates potential outcomes of attempted bribery under different frames and seeks to maximise the likelihood of the preferred outcome. The benefits associated with corruption are not necessarily obtained by the actors directly involved in the transaction and, in some cases, are unspecified. The company Representative looks to obtain an Advantage for the infrastructure company (the Candidate) and they may derive an Indirect Benefit, such as a possibility of promotion or a bonus, contingent on a successful contract negotiation. In other cases, payoffs are not necessarily

tangible, such as a possibility of network connections development by entering into trust relationships. The model, therefore, considers the realm of assessing risks and using different means to achieve the preferred outcome.

One of the key components of the model is goodwill trust – or the Representative's trust that the Intermediary will not behave opportunistically. The extent of the Representative's goodwill trust in the Intermediary depends on the strength of the social connection between the two. It is assumed that the strength of the connection increases with the period of time the two have known each other, combined with the frequency of interactions. Increasing trust with increasing strength of a social connection assumes that the Intermediary is, in fact, inherently trustworthy. Otherwise, if the Intermediary repeatedly breaks promises, the repeated interactions would reveal to the Representative the inherent opportunistic nature of the Intermediary. For the purposes of the model, however, it is assumed that the Intermediary is trustworthy; otherwise the Representative would have broken the tie, reduced the frequency of interactions, and, simply, would not have considered this Intermediary for the role in the corrupt agreement.

5.3.2 Model formulation

The proposed model unifies existing knowledge and results from experimental games on how individuals make choices of frames and delivery methods of corrupt offers, and assesses the importance of social connections between individuals. The model shows the Representative's decision-making processes. The basic structure of the game is shown in Figure 5. When the Representative offers the DM an Incentive, the DM has two choices: to accept or to reject the offer. If the offer is rejected, the game ends. If, however, the offer is accepted, the DM chooses whether to provide the Advantage for the Candidate. Alternatively, they may keep the Incentive and do nothing in return.

Decision taken by:

■ Representative

● Decision Maker

⬡ Intermediary

Frame and method decisions:
- gift/bribe
- direct/via intermediary

Directly (d) via Intermediary (i) Keep incentive (K)

Reject (R) Accept ($\bar{R}$) Pass on Incentive ($\bar{K}$)

Provide Advantage (A) No Advantage ($\bar{A}$)

Reject (R) Accept ($\bar{R}$)

Provide Advantage (A) No Advantage ($\bar{A}$)

Successful corrupt contract (S). Representative's preferred outcome.

Successful corrupt contract (S). Representative's preferred outcome.

Figure 5 Model Version 1 decision tree

The Representative forms a belief over the likelihood that the DM rejects the offer of an Incentive framed as a bribe (b) and delivered directly (d) by the Representative to the DM. This belief is represented as a subjective probability $P(R_{b,d})$, which can take any value between 0 and 1. Provided that the offer is accepted (denoted $\bar{R}_{b,d}$, and $P(\bar{R}_{b,d}) = 1 - P(R_{b,d})$), the Representative forms a belief of whether the DM is likely to reciprocate with an Advantage for the Candidate: $P(A_{b,d}|\bar{R}_{b,d})$. Therefore, the subjective probability of a successful corrupt contract $P(S_{b,d})$, where the direct bribe offer is accepted by the DM, and they reciprocate with an Advantage is:

$$P(S_{b,d}) = P(A_{b,d} \cap \bar{R}_{b,d}) = P(A_{b,d}|\bar{R}_{b,d}) * P(\bar{R}_{b,d}) \tag{E5.3.1}$$

Similarly, if the Representative decides to offer the Incentive under the frame of a gift (g), the subjective probability of a successful corrupt contract is denoted $P(S_{g,d})$:

$$P(S_{g,d}) = P(A_{g,d} \cap \bar{R}_{g,d}) = P(A_{g,d}|\bar{R}_{g,d}) * P(\bar{R}_{g,d}) \tag{E5.3.2}$$

The Representative may choose an Intermediary to deliver the bribe instead of offering it directly to the DM. $P(K_{b,i})$ represents the subjective probability that the Intermediary does not pass the bribe along to the DM. A successful corrupt contract, in this case, is established if the Intermediary passes the bribe along to the relevant DM ($\bar{K}_{b,i}$), the DM accepts the offer ($\bar{R}_{b,i}$) and provides an Advantage to the Candidate ($A_{b,i}$). The subjective probability of this outcome is denoted $P(S_{b,i})$:

$$P(S_{b,i}) = P(A_{b,i} \cap \bar{R}_{b,i} \cap \bar{K}_{b,i}) = P(A_{b,i}|\bar{R}_{b,i} \cap \bar{K}_{b,i}) * P(\bar{R}_{b,i}|\bar{K}_{b,i}) * P(\bar{K}_{b,i})$$

$$\tag{E5.3.3}$$

As discussed in Section 5.2.2, using an Intermediary reduces the perceived risk of exposure, and reduces the psychological costs of engaging in corrupt agreements for both the Representative and the DM. Therefore, an assumption is made that the Representative believes that the likelihood that the bribe offer is accepted by the DM when the Intermediary (i) is used is larger than if the offer is made directly: $P(\bar{R}_{b,i}|\bar{K}_{b,i}) > P(\bar{R}_{b,d})$.

Let x_1 represent the difference in how likely the Representative believes the bribe offer is to be accepted if it is provided via an Intermediary compared with a direct offer: $P(\bar{R}_{b,i}|\bar{K}_{b,i}) = P(\bar{R}_{b,d}) + x_1$. There is no opportunism (i.e. no possibility of the Intermediary keeping the bribe) in the case where the bribe is offered directly, and the offer always reaches the DM: $P(\bar{K}_{b,d}) = 1$. Opportunism from the side of the Representative can also be included in the model by setting $P(\bar{K}_{b,d}) \leq 1$. In this case, the Candidate's perception of the Representative's trustworthiness can be included. This, however, is outside the scope of this model. The focus here is on the Intermediaries and their roles in corrupt agreements.

Variable x_1 is assumed to be positive, and its magnitude depends on the perceived characteristics of the Intermediary. An offer of a bribe requires tact, so as not to cause an insult to the receiving party (Boehm and Lambsdorff, 2009). Therefore, x_1 depends on the Representative's trust in the Intermediary's competence to perform the role of offering the bribe. Ferriani et al. (2013) suggest that economic connections allow the exchange of information that fosters competence trust. Assuming that the Intermediary is, in fact, inherently competent in performing this role, the Representative's level of trust in the Intermediary's ability is a function of the economic connection strength between the Representative and the Intermediary. Thus, x_1 is assumed to be proportional to economic connection strength.

However, if the Intermediary is used, and even if they are perceived as competent, they may keep the bribe and not pass it along to the intended DM. The Representative forms a belief over the likelihood that the Intermediary keeps the bribe. The perceived likelihood of the Intermediary not behaving opportunistically relies on Representative's goodwill trust in the Intermediary. Again, drawing from Ferriani et al. (2013), goodwill trust relies on a social connection between the Representative and the Intermediary. Henceforth, the subjective probability that the Intermediary will not behave opportunistically $(x_2 = P(\bar{K}_{b,i}) = 1 - P(K_{b,i}))$ is assumed to be proportional to the social connection strength between the Intermediary and the Representative.

Substituting $P(\bar{K}_{b,i}) = x_2$ and $P(\bar{R}_{b,i}|\bar{K}_{b,i}) = P(\bar{R}_{b,d}) + x_1$ into equation (E5.3.3):

$$P(S_{b,i}) = P(A_{b,i}|\bar{R}_{b,i} \cap \bar{K}_{b,i}) * (P(\bar{R}_{b,d}) + x_1) * x_2 \qquad \text{(E5.3.4)}$$

Assuming that the bribe is equally likely to be reciprocated with an Advantage by the DM, whether it is offered via an Intermediary or directly, $P(A_{b,i}|\bar{R}_{b,i} \cap \bar{K}_{b,i}) = P(A_{b,d}|\bar{R}_{b,d})$. Making this substitution in (E5.3.4):

$$P(S_{b,i}) = P(A_{b,d}|\bar{R}_{b,d}) * (P(\bar{R}_{b,d}) + x_1) * x_2 \qquad \text{(E5.3.5)}$$

The Representative would consider using the Intermediary if the likelihood of a successful corrupt agreement is greater or equal to its likelihood if the bribe is offered directly:

$$P(S_{b,i}) \geq P(S_{b,d}) \qquad \text{(E5.3.6)}$$

Substituting (E5.3.5 and E5.3.1) into (E5.3.6):

$$P(A_{b,d}|\bar{R}_{b,d}) * (P(\bar{R}_{b,d}) + x_1) * x_2 \geq P(A_{b,d}|\bar{R}_{b,d}) * P(\bar{R}_{b,d}) \qquad \text{(E5.3.6)}$$

Simplifying (E5.3.6):

$$\left(P(\bar{R}_{b,d}) + x_1\right) * x_2 \geq P(\bar{R}_{b,d}) \tag{E5.3.7}$$

The implications of (E5.3.7) are discussed in Section 5.3.3. First, a comparison of the perceived likelihoods of a successful corrupt contract under the gift and bribe frames is made.

As discussed in Section 5.2.1, a gift frame is perceived to be more subtle and less offensive than a bribe frame of a corrupt offer, at the cost of a less apparent quid-pro-quo. Accepting an Incentive framed as a gift might provide the DM with plausible deniability in the event the corrupt agreement is discovered. Therefore, it is assumed that the Representative believes that a gift offer is more likely to be accepted than a bribe offer: $P(\bar{R}_{g,d}) > P(\bar{R}_{b,d})$. Let y_1 represent the difference in how likely the Representative believes the gift offer is to be accepted by the DM compared with the bribe offer: $P(\bar{R}_{g,d}) = P(\bar{R}_{b,d}) + y_1$.

The Lambsdorff and Frank (2010) experiment shows that bribe offers are slightly more likely to be reciprocated than gift offers. Therefore, the perceived likelihood of the DM providing an Advantage to the Candidate is assumed to be higher under the bribe frame: $P(A_{b,d}|\bar{R}_{b,d}) > P(A_{g,d}|\bar{R}_{g,d})$. Let y_2 represent the difference in how likely the DM is thought to provide an Advantage under the bribe and the gift frames: $P(A_{g,d}|\bar{R}_{g,d}) = P(A_{b,d}|\bar{R}_{b,d}) - y_2$.

Substituting $P(\bar{R}_{g,d}) = P(\bar{R}_{b,d}) + y_1$ and $P(A_{g,d}|\bar{R}_{g,d}) = P(A_{b,d}|\bar{R}_{b,d}) - y_2$ into (E5.3.2):

$$P(S_{g,d}) = (P(A_{b,d}|\bar{R}_{b,d}) - y_2) * (P(\bar{R}_{b,d}) + y_1) \tag{E5.3.8}$$

Similarly to the choice made between involving an Intermediary and offering a bribe directly to the DM, the Representative chooses to use a gift frame if the subjective probability of a successful corrupt agreement is at least as high as with the bribe frame:

$$P(S_{g,d}) \geq P(S_{b,d}) \tag{E5.3.9}$$

Substituting E5.3.8 and E5.3.1 into E5.3.9:

$$(P(A_{b,d}|\bar{R}_{b,d}) - y_2) * (P(\bar{R}_{b,d}) + y_1) \geq P(A_{b,d}|\bar{R}_{b,d}) * P(\bar{R}_{b,d}) \tag{E5.3.10}$$

If the Representative makes a choice between the gift delivered directly and a bribe delivered via an Intermediary, the bribe-Intermediary choice will be made if:

$$P(S_{b,i}) \geq P(S_{g,d}) \tag{E5.3.11}$$

Substituting (E5.3.5) and (E5.3.8) into (E5.3.11):

$$P(A_{b,d}|\bar{R}_{b,d}) * (P(\bar{R}_{b,d}) + x_1) * x_2 \geq (P(A_{b,d}|\bar{R}_{b,d}) - y_2) * (P(\bar{R}_{b,d}) + y_1)$$
$$\tag{E5.3.12}$$

The next section discusses the implications of Version 1 of the model.

5.3.3   Model Version 1 Analysis

This section discusses Version 1 of the model. In this section, if the Representative has high goodwill trust in the Intermediary, this Intermediary will henceforth be referred to as trustworthy. If the Representative has high competence trust in the Intermediary, they will be referred to as competent.

Re-arranging (E5.3.7) to make x_2 the subject:

$$x_2 \geq \frac{P(\bar{R}_{b,d})}{(P(\bar{R}_{b,d})+x_1)} \qquad\qquad \text{(E5.3.13)}$$

As set out in Section 5.3.2, x_2 represents the subjective probability estimated by the Representative that the Intermediary will not keep the Incentive. That is, it represents the belief as to what extent the Intermediary can be trusted. The strength of this goodwill trust depends on the strength of the social connection between the Intermediary and the Representative. x_2 is an ordinal variable, and can take any value is between 0 and 1. That is, if the Representative perceives the Intermediary to be completely untrustworthy, x_2 takes the value 0. This means that the Representative expects the Intermediary to keep the Incentive and not pass it along to the DM. The values of 0.2, 0.4, 0.6, 0.8 and 1 represent, respectively, the following levels of trust: low, low to medium, medium to high, high, and complete trust.

x_1 in the denominator of equation E5.3.13 represents the difference in how likely the Representative believes the bribe offer is to be accepted if it is provided via an Intermediary compared with a direct offer. If $x_1 = 0$, the Representative believes that the DM is equally likely to accept the Incentive offer if it is extended directly by the Representative or via an Intermediary. According to equation E5.3.13, if $x_1 = 0$, $x_2 \geq \frac{P(\bar{R}_{b,d})}{P(\bar{R}_{b,d})} = 1$. That is, the Representative would in this case require complete trust that the Intermediary would indeed deliver the offer, for the Representative to consider using an Intermediary.

If the Representative believes that the Intermediary can increase the chances of the Incentive being accepted, there is a trade-off between the two types of trust. Figure 6 shows the minimum levels of goodwill trust required for the Representative to choose the Intermediary to deliver the Incentive to the DM. In this figure, $x_1 = 0.2$, meaning that the Representative believes that the Intermediary can increase the chances of the offer being accepted by a small

amount, such as 20%. The x-axis shows the probability of the direct bribe offer being accepted $(P(\bar{R}_{b,d}))$. The indifference line (the line separating the two areas) shows the minimum levels of goodwill trust required for the Representative to use the Intermediary.

Figure 6 Minimum levels of goodwill trust required for the Representative to choose the Intermediary to deliver the Incentive (x_1=0.2)

Figure 6 shows that, as the subjective probability of a direct offer acceptance increases, the minimum level of goodwill trust also increases. In low corruption environments, where the probability of the corrupt offer being accepted is close to 0, the Representative is prepared to employ an Intermediary whose trustworthiness is low (level of minimum goodwill trust is close to 0). However, in high-corruption environments, where bribe acceptance rates are high, the Representative would choose trustworthy Intermediaries to deliver the bribe.

There is a kink in the curve in Figure 6 in the top right-hand corner. This is because the denominator in equation E5.3.13 cannot be greater than 1. That is, the subjective probability that the bribe offer is accepted if it is provided via an Intermediary $(P(\bar{R}_{b,d}) + x_1)$ is less than or equal to 1. This means that, if the likelihood of acceptance of a bribe offered directly is already high $(P(\bar{R}_{b,d}) \geq 0.8)$ and the Intermediary can increase this likelihood by a small amount $(x_1 \leq 0.2)$, the Intermediary's role is to make an already highly likely event almost certain in the Representative's assessment. This increases the minimum levels of goodwill trust required for the Intermediary to be used.

Figure 7 shows minimum levels of goodwill trust required for the Representative to choose the Intermediary to deliver the Incentive for varying levels of competence trust. As x_1 increases, the Representative perceives the Intermediary to be more competent in delivering the Incentive in such a way that it is accepted by the DM. Therefore, there is some substitutability between competence and goodwill trust. However, the two are not perfect substitutes, and substantial goodwill trust levels are required for the Representative to use the Intermediary in highly-corrupt environments, even if they are perceived as highly competent.
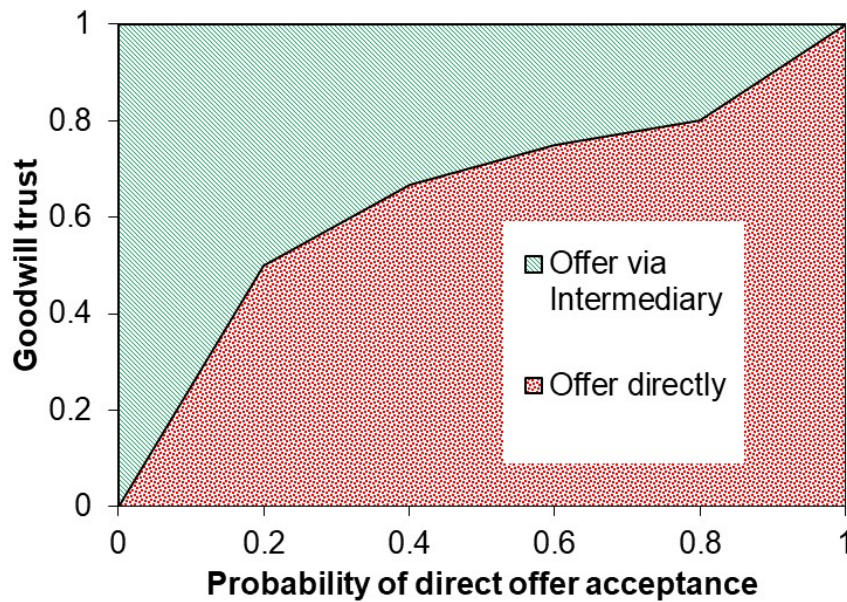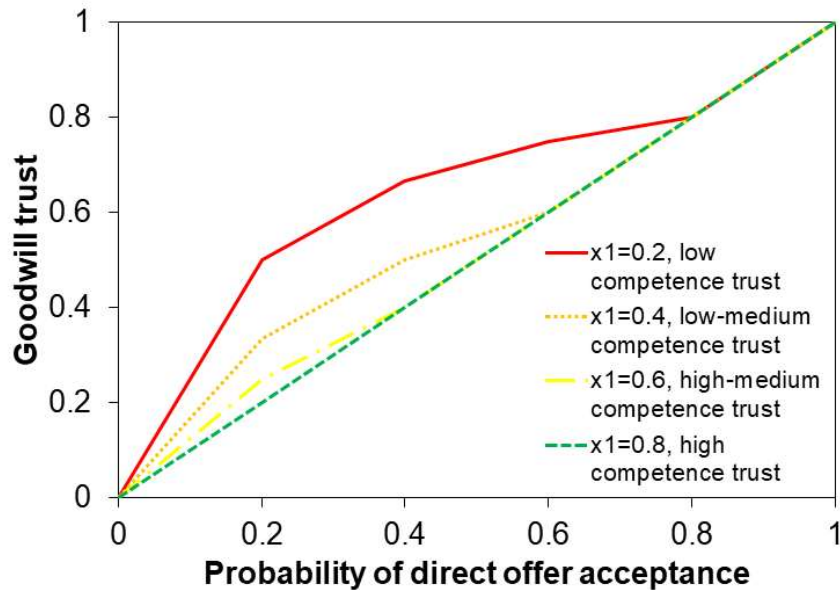
Figure 7 Minimum levels of goodwill trust required for the Representative to choose the Intermediary to deliver the Incentive for varying levels of competence trust.

Unlike E5.3.7, equations E5.3.10 and E5.3.12, where the gift frame is considered, do not yield to the same level of simplification. That is, even after the equations are re-arranged and simplified, they consist of more than three variables, which makes the analysis and drawing any conclusions difficult.

The next section provides discussion of Version 1 of the model.

5.3.4   Discussion of Version 1 of the Model

Version 1 of the model is based on comparisons of subjective probabilities of a successful corrupt contract under different frames and methods of Incentive delivery. It relies on the ability of the Representative to rank the likelihoods of key events: corrupt offer acceptance by the DM, DM's reciprocation with an Advantage for the Company, and opportunistic behaviour by the Intermediary.

Although the Model offers an insight into the importance of the Representative's goodwill and competence trust in the Intermediary, it is difficult to gain similar insights for the importance of the gift frame.

Variables x_1, x_2, y_1 and y_2 are difficult to estimate. Although the concepts of social and economic network connections creating channels for information exchange fostering goodwill (x_2) and competence (x_1) trust have been discussed in past literature (Ferriani et al., 2013), both the strength of the different network ties and the level of trust are difficult to quantify or even order. In reality, multiplex ties are likely to evolve, and the separation between the different types of ties is not always feasible (multiplex ties mean that individuals interact with each other in multiple social contexts).

Version 1 of the model requires data on how individuals estimate the likelihood of Incentive acceptance and reciprocity if the offer is framed as a gift or a bribe. Although studies such as Lambsdorff and Frank (2010) provide some insight into how participants respond to different frames, it does not allow extrapolation to, for example, how 'bribe-givers' compare the likelihoods of gift or bribe acceptance. There are no known studies estimating such subjective probabilities.

As outlined in Section 5.3.1, the model relies on the assumption that competence trust and goodwill trust increase as the strength of the economic and social connections increase. Repeated interactions between individuals can reveal negative as well as positive characteristics. Therefore, if the Intermediary is inherently incompetent or untrustworthy, this will be revealed to the Representative through past interactions. It can be assumed, however, that the Representative would not keep the connections with such an Intermediary and would not consider them for setting up a new corrupt agreement.

Although it is recognised that individuals can act contrary to payoff-maximising interests, disregarding expected payoffs in the model provides limited insight.

Therefore, the second version of the model takes into consideration expected payoffs. As the Representative's payoff can be thought to be proportional to the company's (Candidate's) payoff, the second version of the model is based on maximisation of the Candidate's profits, assuming that the Representative receives some fraction α of the payoff π.

Considering expected payoffs from any action requires listing payoffs and probabilities of every outcome. Therefore, Version 2 of the model cannot be limited to considering only the probabilities of the most-preferred outcome, as has been done for Version 1 of the model.

5.4 Model Version 2

The second version of the model focuses on the framing of the corrupt offer. The model considers only direct Incentive offers by the Representative, without the involvement of an Intermediary. It is assumed that, if the Representative does not attempt to offer a corrupt Incentive to the DM, the Candidate stands a chance of being allocated the contract with probability P(S), but this probability is small, and close to 0. Figure 8 shows the model's decision tree.

This section first separately considers two subgames and evaluates: a) the choices of the Representative to increase the chances that the DM reciprocates with an Advantage, assuming that the corrupt offer has already been accepted; and b) the choices of the Representative to increase the chances that the DM accepts the Incentive, assuming that the Advantage will be forthcoming. That is, the Candidate's expected payoffs are considered assuming that the DM accepted the offer, but it is not certain whether they will reciprocate with the Advantage (a). Then, separately, the payoffs are considered assuming that the Advantage will be forthcoming with certainty if the DM accepts the offer (b). The two subgames are then considered together.

Figure 8 Model Version 2 decision tree

Decision taken by:

■ Representative

● Decision Maker

π Candidate's payoff
C Contract Value
B Bribe Value
G Gift Value
$P(S)$ Probability the Candidate is awarded the contract without corruption

Do not offer an Incentive → $\pi = (P(S) * C)$

Frame offer as a gift

Frame offer as a bribe

Reject (R_g)

Accept ($\overline{R_g}$)

Reject (R_b)

Accept ($\overline{R_b}$)

$\pi = P(R_g) * (P(S) * C)$

Provide Advantage (A_g)

No Advantage ($\overline{A_g}$)

$\pi = P(R_b) * (P(S) * C)$

Provide Advantage (A_b)

No Advantage ($\overline{A_b}$)

$\pi = P(A_g | \overline{R_g}) * (P(S) + \beta) * C - G$

$\pi = P(\overline{A_g} | \overline{R_g}) * (P(S)) * C - G$

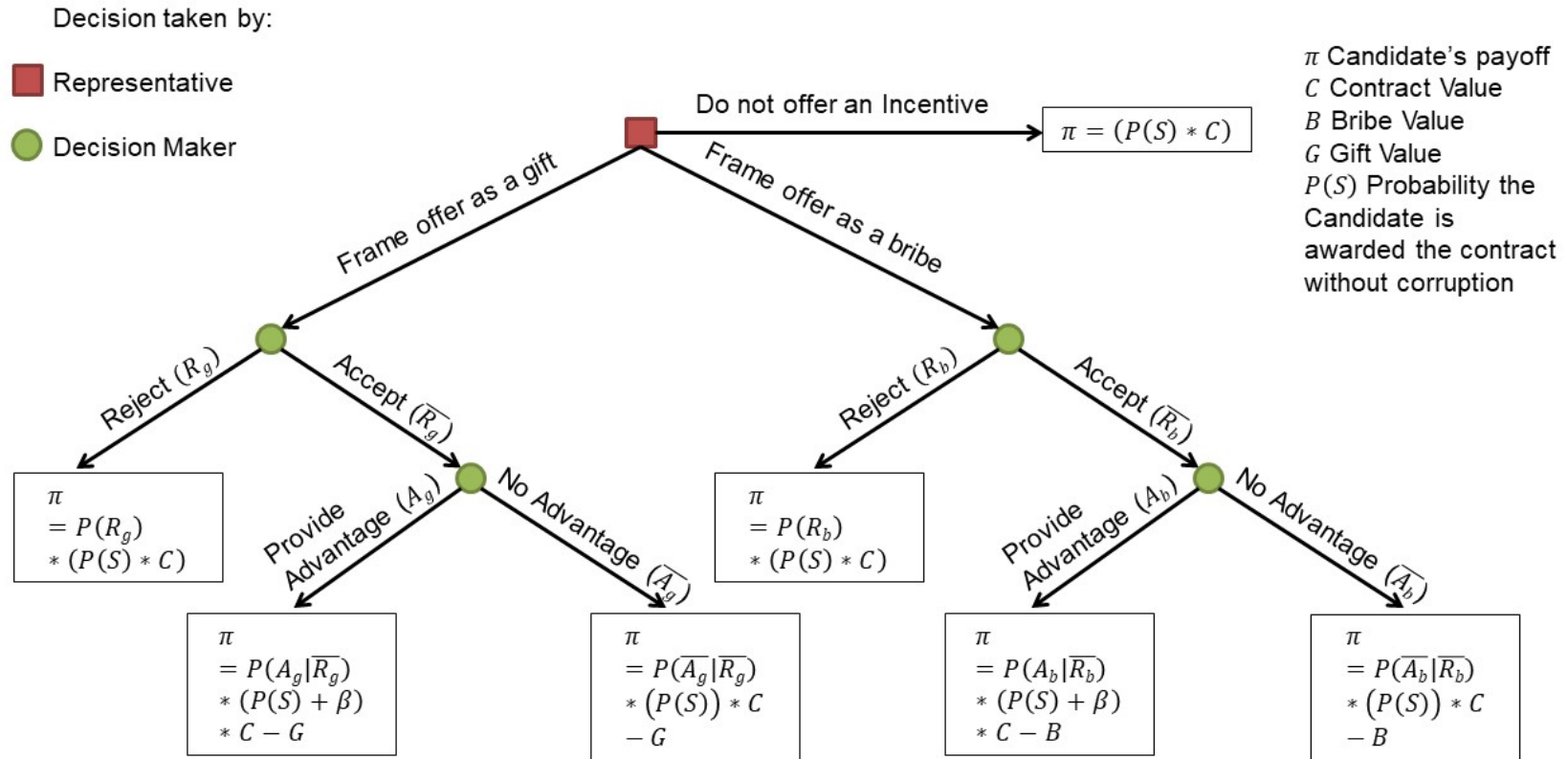$\pi = P(A_b | \overline{R_b}) * (P(S) + \beta) * C - B$

$\pi = P(\overline{A_b} | \overline{R_b}) * (P(S)) * C - B$

Let the contract value to the Candidate equal £C, which represents the profits the company expects to make from the contract. The Representative estimates the probability of a successful contract acquisition as *P(S)*. If the Representative does nothing, and awaits the decision of the tendering committee, the expected payoff is $\pi = P(S) * C$. $P(S)$ is assumed to be small, and close to 0. Alternatively, the Representative may offer one of the key Decision Makers (DMs) an Incentive to manipulate the tendering procedure in such a way that increases the Candidate's chances of winning the tender. The Incentive can be framed as a gift of size £*G* or a bribe of size £*B*. In return, the DM can increase the likelihood of the Candidate obtaining the contract by some margin β, such that $P(S_m) = P(S) + \beta$, where $P(S_m)$ stands for probability of a successful contract acquisition where the DM manipulates the tendering procedures in favour of the Candidate. Assuming that the DM does not have full control over the tendering process, even with DM's support, a successful contract acquisition may not be certain: $P(S_m) \leq 1$.

If the Representative decides to offer the Incentive as a gift, the Candidate's expected payoff is:

$$\pi_g = (P(S) + \beta) * C - G \tag{E5.4.1}$$

Alternatively, if the Incentive is framed as a bribe, the payoff is:

$$\pi_b = (P(S) + \beta) * C - B \tag{E5.4.2}$$

Equations (E5.4.1) and (E5.4.2) hold true if the DM always accepts the offer of an Incentive and always reciprocates with an Advantage β. That is, $P(\beta > 0) = 1$. However, even after receiving the Incentive, the DM may not reciprocate with an Advantage. With probability $P(A)$ the DM provides the Advantage, and $\beta > 0$, and with probability $1 - P(A)$, $\beta = 0$.

If the Representative decides to offer a bribe, the Candidate's expected payoff is:

$$\pi_b = P(A) * \big((P(S) + \beta) * C - B\big) + \big(1 - P(A)\big) * (P(S)C - B) \qquad \text{(E5.4.3)}$$

The Representative would only consider offering a bribe if the expected payoff is non-negative: $\pi_b \geq 0$. Equation E5.4.3 simplifies to (Appendix B1 shows the re-arrangement and simplification of Equation E5.4.3):

$$\beta \geq \frac{B/_C - P(S)}{P(A)} \qquad \text{(E5.4.4)}$$

Likewise, when the gift frame is used, the payoff function

$$\pi_g = P(A) * \big((P(S) + \beta) * C - G\big) + \big(1 - P(A)\big) * (P(S)C - G) \qquad \text{(E5.4.5)}$$

Simplifies to:

$$\beta \geq \frac{G/_C - P(S)}{P(A)} \qquad \text{(E5.4.6)}$$

For the Representative to consider offering the relevant DM a bribe or a gift, the lowest value of the expected payoff is 0: $\pi_b = \pi_g = 0$. Therefore, the minimum values of β are:

$$\beta = \frac{B/_C - P(S)}{P(A)} \qquad \text{(E5.4.7)}$$

$$\beta = \frac{G/_C - P(S)}{P(A)} \qquad \text{(E5.4.8)}$$

$$\frac{B/_C - P(S)}{P(A)} = \frac{G/_C - P(S)}{P(A)} \qquad \text{(E5.4.9)}$$

116

Equation (E5.4.9) simplifies to $B = G$, suggesting that the values of a gift or a bribe would be the same. However, this relies on the assumption that the official is equally likely to provide an Advantage whether the Incentive is framed as a gift or a bribe. As discussed in Lee and Pinker (2010) (Experiment 2), the overt rather than veiled offer of a bribe was chosen by the experiment participants because of the directness and the clarity this option offers. That is, it is perceived as being clearer that the party offering a bribe is seeking something in return. In Lambsdorff and Frank (2010), there was a slight tendency to reciprocate more often under the bribe frame than the gift frame. Therefore, if the probability of the DM to provide an Advantage is higher with the bribe frame,

$$P(A_b) > P(A_g) \hspace{3cm} \text{(E5.4.10)}$$

Equation (E5.4.9) then simplifies as follows:

$$\frac{B/_C - P(S)}{P(A_b)} = \frac{G/_C - P(S)}{P(A_g)}$$

$$\frac{B/_C - P(S)}{G/_C - P(S)} = \frac{P(A_b)}{P(A_g)}$$

From equation E5.4.10, it follows that $\frac{P(A_b)}{P(A_g)} > 1$. Therefore:

$$\frac{B/_C - P(S)}{G/_C - P(S)} > 1$$

$$B/_C - P(S) > G/_C - P(S)$$

$$B > G$$

This suggests that, if the bribe is more likely to be reciprocated with an Advantage, the value of the bribe is likely to be larger than the value of the gift.

The above discussion relies on the DM always accepting the offer of an Incentive. However, the DM may reject the offer outright with probability $P(R)$. The discussion that follows below focuses on the expected payoff of the Candidate assuming that the DM always reciprocates with an Advantage if they accept the offer of a gift or a bribe. Therefore, the focus is on the likelihood of offer acceptance.

An assumption is made that, if the offer of a bribe is rejected, the Candidate does not pay out the value of the bribe £B. Additionally, the DM does not report the corrupt offer to the authorities and the Candidate is allowed to continue participating in the tendering process. Then, the Candidate's expected payoff is:

$$\pi_b = \left(1 - P(R)\right) * ((P(S) + \beta) * C - B) + P(R)P(S)C \tag{E5.4.11}$$

Similarly to the discussion above, the Representative would consider offering a bribe if $\pi_b \geq 0$:

$$\left(1 - P(R)\right) * ((P(S) + \beta) * C - B) + P(R)P(S)C \geq 0 \tag{E5.4.12}$$

Equation E5.4.12 simplifies to (Appendix B2 shows the re-arrangement and simplification of equation E5.4.12):

$$\beta \geq \frac{B}{C} - \frac{P(S)}{1 - P(R)} \tag{E5.4.13}$$

Likewise, if the gift frame is used:

$$\pi_g = \left(1 - P(R)\right) * ((P(S) + \beta) * C - G) + P(R)P(S)C$$

$\pi_g \geq 0$

$$\big(1 - P(R)\big) * \big((P(S) + \beta) * C - G\big) + P(R)P(S)C \geq 0 \tag{E5.4.14}$$

Equation E5.4.14 simplifies to:

$$\beta \geq \frac{G}{C} - \frac{P(S)}{1 - P(R)} \tag{E5.4.15}$$

Again, the Representative would consider using a bribe or a gift if the expected payoff at least 0: $\pi_b = \pi_g = 0$. Therefore, the minimum values of β are as follows:

$$\beta = \frac{B}{C} - \frac{P(S)}{1 - P(R)}$$

$$\beta = \frac{G}{C} - \frac{P(S)}{1 - P(R)}$$

$$\frac{B}{C} - \frac{P(S)}{1 - P(R)} = \frac{G}{C} - \frac{P(S)}{1 - P(R)} \tag{E5.4.16}$$

If the subjective probability of gift acceptance is the same as the subjective probability of bribe acceptance, the values of the bribe or the gift would be the same, $B = G$. However, assuming that gifts are more likely to be accepted:

$$1 - P(R_b) < 1 - P(R_g) \tag{E5.4.17}$$

Equation E5.4.16 then simplifies as follows:

$$\frac{B}{C} - \frac{P(S)}{1 - P(R_b)} = \frac{G}{C} - \frac{P(S)}{1 - P(R_g)} \tag{E5.4.18}$$

From equation E5.4.17, it follows that $\frac{1}{1 - P(R_b)} > \frac{1}{1 - P(R_g)}$. Then,

$$\frac{P(S)}{1 - P(R_b)} > \frac{P(S)}{1 - P(R_g)}$$

$$-\frac{P(S)}{1 - P(R_b)} < -\frac{P(S)}{1 - P(R_g)}$$

For the equality in equation E5.4.18 to hold,

$$\frac{B}{C} > \frac{G}{C}$$

$$B > G$$

Thus far, it has been shown that the sizes of bribes are expected to be higher than the values of gifts under two separate assumptions. The first assumption is that gifts are less likely to be reciprocated with an Advantage than bribes. The second assumption is that gifts are more likely to be accepted than bribes. Next, the two assumptions are put together. That is, if the Representative offers the DM a bribe, there are three possible outcomes. The DM rejects the offer with probability $P(R)$, accepts the offer and provides an advantage with probability $(1 - P(R)) * P(A)$, and accepts the offer but provides no advantage with probability $(1 - P(R)) * (1 - P(A))$. The Candidate's expected payoff is as follows:

$$\pi_b = P(R)(P(S)C) + (1 - P(R)) * P(A) * ((P(S) + \beta)C - B) + (1 - P(R)) *$$
$$(1 - P(A)) * (P(S)C - B) \tag{E5.4.19}$$

Equation (E5.4.19) simplifies to (Appendix B3 shows the re-arrangement and simplification of equation E5.4.19):

$$\pi_b = (P(A)\beta C - B) * (1 - P(R)) + P(S) \tag{E5.4.20}$$

Similarly, the Candidate's expected payoff if the corrupt Incentive is offered to the DM as a gift is as follows:

$$\pi_g = P(R)(P(S)C) + \big(1 - P(R)\big) * P(A) * \big((P(S) + \beta)C - G\big) + \big(1 - P(R)\big) * \big(1 - P(A)\big) * (P(S)C - G)$$ (E5.4.21)

Equation (E5.4.21) simplifies to

$$\pi_g = (P(A)\beta C - G) * \big(1 - P(R)\big) + P(S)$$ (E5.4.22)

As above, subscripts $_b$ and $_g$ are included in equations E5.4.20 and E5.4.22 to differentiate between the probabilities of offer acceptance $(1 - P(R_b)$ and $1 - P(R_g))$ and reciprocation $(P(A_b)$ and $P(A_g))$ under the bribe and gift frames:

$$\pi_b = (P(A_b)\beta C - B)(1 - P(R_b)) + P(S)C$$ (E5.4.23)

$$\pi_g = (P(A_g)\beta C - G)(1 - P(R_g)) + P(S)C$$ (E5.4.24)

As before, it is assumed that the Representative would consider offering a bribe or a gift if the expected payoffs are non-negative: $\pi_b \geq 0$; $\pi_g \geq 0$. Equation E5.4.23 is re-arranged to make β the subject (Appendix B4 shows the re-arranging of equation E5.4.23):

$$\beta \geq \frac{\dfrac{B}{C} - \dfrac{P(S)}{\big(1 - P(R_b)\big)}}{P(A_b)}$$

Equation E5.4.24 is re-arranged to make β the subject:

$$\beta \geq \frac{\dfrac{G}{C} - \dfrac{P(S)}{\big(1 - P(R_g)\big)}}{P(A_g)}$$

The Representative would consider using a bribe or a gift if the expected payoff is at least 0: $\pi_b = \pi_g = 0$. Therefore, the minimum values of β are:

$$\beta = \frac{\frac{B}{C} - \frac{P(S)}{(1 - P(R_b))}}{P(A_b)}$$

$$\beta = \frac{\frac{G}{C} - \frac{P(S)}{(1 - P(R_g))}}{P(A_g)}$$

$$\frac{\frac{B}{C} - \frac{P(S)}{(1 - P(R_b))}}{P(A_b)} = \frac{\frac{G}{C} - \frac{P(S)}{(1 - P(R_g))}}{P(A_g)}$$

$$\frac{\frac{B}{C} - \frac{P(S)}{(1 - P(R_b))}}{\frac{G}{C} - \frac{P(S)}{(1 - P(R_g))}} = \frac{P(A_b)}{P(A_g)}$$

Because the probability that the DM will provide an advantage under the bribe frame is assumed to be higher than under the gift frame ($P(A_b) > P(A_g)$), $\frac{P(A_b)}{P(A_g)} > 1$,

$$\frac{\frac{B}{C} - \frac{P(S)}{(1 - P(R_b))}}{\frac{G}{C} - \frac{P(S)}{(1 - P(R_g))}} > 1$$

$$\frac{B}{C} - \frac{P(S)}{(1 - P(R_b))} > \frac{G}{C} - \frac{P(S)}{(1 - P(R_g))}$$

$$\frac{B - G}{C} > \frac{P(S)}{\left(1 - P(R_b)\right)} - \frac{P(S)}{\left(1 - P(R_g)\right)}$$

Because the probability of a bribe offer being accepted is assumed to be lower than that of a gift offer $(1 - P(R_b) < 1 - P(R_g))$, $\frac{1}{1-P(R_b)} > \frac{1}{1-P(R_g)}$. Therefore,

$$\frac{P(S)}{1 - P(R_b)} > \frac{P(S)}{1 - P(R_g)}$$

$$\frac{P(S)}{1 - P(R_b)} - \frac{P(S)}{1 - P(R_g)} > 0$$

$$\frac{B - G}{C} > 0$$

$$B - G > 0$$

$$B > G$$

Therefore, the sizes of bribes are expected to be higher than the sizes of gifts.

5.5 Discussion and conclusions

This chapter presented two versions of the Representative's (bribe-giver's) decision-making model. The model is based on subjective probabilities (beliefs) of the Representative over the chances of securing a successful corrupt contract with the DM when using different frames of the offer, and different methods of offer delivery. The model proposes a method of representing how pre-existing networks facilitate the development of corrupt networks. It also shows how company Representatives can strategically use bribe or gift frames to offer corrupt Incentives to the Decision Makers.

In version 1 of the model, the Representative is driven by the objective of obtaining an unfair Advantage for the Candidate in the project bidding process. Version 1 provides an insight into the content of network connections between the Representative and the Intermediary necessary for the latter to be trusted and used to facilitate a corrupt transaction. It suggests that in high-corruption environments, Representatives would choose an Intermediary they have high levels of trust in (who can be trusted to deliver the bribe to the DM and not keep it). In the absence of this trust, the Representatives would choose to deliver the bribe directly to the DM without the use of an Intermediary.

Version 1 of the model is based on the assumption that the DM is more likely to accept a bribe via an Intermediary than directly from the Representative. If the Representative believes that the offer is equally likely to be accepted delivered directly or via an Intermediary, the Representative would require complete trust that the Intermediary will deliver the bribe to the DM.

However, version 1 of the model includes parameters which are difficult to estimate and it provides little insight into the choice between the gift and the bribe frames. The payoff structures for the Candidate are introduced into the model to develop Version 2. This version focuses on the choice between a gift and a bribe frame of the corrupt offer. Under the assumptions of the model, the value of the bribe offer is expected to be larger than the gift offer. This is contrary to the results of Lambsdorff and Frank (2010), where the sizes of bribes offered in laboratory experiments were slightly smaller than the sizes of gifts. The reason for this difference in results could be that another social cue affected the decisions of the bribe-givers in the experimental study that did not form a part of the model in this chapter. This cue could be, for example, offering a larger proportion of the resource to the party one is attempting to create an affective tie with through the offering of a gift.

The model in this chapter was developed with a view to represent the bribe-givers as objective- or rule-driven. This was done because the payoff-

maximising assumptions of Rational Choice models may not be applicable to situations where social cues, expectations and norms play an important part in decision making. However, developing a model based on objective-driven behaviour using game-theory techniques has proven difficult. Version 1 of the model yielded functions that could not be reduced to less than three variables, and it proved difficult to gain an insight into the strategic choices of corrupt offer frames.

Introducing payoff functions for version 2 has produced unwieldy equations. Although they could be reduced to gain an insight into the differences in the sizes of bribe and gift offers, managing such models is challenging, and testing new assumptions requires lengthy calculations.

Therefore, game theory techniques may not be the optimal method of analysing interactions between individuals guided by social cues, norms and expectations. Simulation models can be a better fit for such analyses. Therefore, the analysis of the decision making processes of DMs in the next chapter will be carried out using social simulation modelling techniques.

The insights of this chapter and the strategies of the bribe-givers are further discussed later in this thesis. Section 8.2 discusses the methods used to develop the model in this chapter. The possible strategies that can be used by the bribe-givers discussed in this chapter are then revisited in Section 8.3 and assessed against the insights developed through the case studies analysis.

6 Model 2: Social norm-based simulation model of decision-making processes in corrupt agreements

6.1 Introduction

Despite the large amount of attention received by the topic of corruption and the international efforts to combat it, the phenomenon is persistent (Mishra, 2006). There remain puzzles about corrupt behaviour that cannot be fully explained by theories focusing on individual behaviour in isolation from its institutional and normative context. For example, the sizes of political bribes are well below the value of "rents" collected by the bribe-payers (the Tullock paradox (Tullock, 1980, Rasmusen and Ramseyer, 1994)). Although economic motives are thought to be at the core of corrupt transactions, it has been noted that social norms can also help explain such behaviour (Rose-Ackerman, 2010a). This chapter addresses the second question of the thesis set out in Section 3.2: How do social norms affect bribe-takers' choices?

With a few exceptions, existing models of corruption represent agents' decisions as a monetary utility- or benefit-maximising problem, following the assumptions of Rational Choice models. Such models largely ignore intrinsic motivations and social incentives to reciprocate or to avoid social disapproval (Fehr and Falk, 2002). Norms against corruption are rarely taken into consideration, and there are few formal models that show how monetary payoffs interact with the costs associated with breaking social norms.

Corruption researchers have called for ideas, norms and culture to be taken more seriously in explaining corruption (Hopkin, 2002). As discussed in Section 2.3.4, where moral costs of engaging in corruption are referred to in formal models, they are either not formally represented (Bayar, 2005, Situngkir, 2003), or, if represented, then only as one additional cost parameter in the payoff functions, without specifying the content and sources of these costs

(Groenendijk, 1997). A method of conceptualising norms against corruption common in past literature is through the level of honesty. This has been implemented by randomly separating actors into honest or dishonest groups, with corrupt partners making decisions based on the probability of facing an honest partner (Aidt, 2003, Uribe, 2012, Bayar, 2005, Bayar, 2009). Alternatively, a degree of honesty on some scale has been used (Situngkir, 2003, Lui, 1986).

This chapter presents a model of decision-making processes in corrupt agreements based on a conflict of social norms of behaviour. The model is similar in structure to Model 1 in Chapter 5, but this time the choices of the DM (the official) are explored in more detail. The model proposes a method of linking legitimacy of institutions, group behaviour status quo, and social network connections with self-seeking behaviour. This chapter explores the mechanisms left as a 'black box' in past modelling efforts (Boehm and Lambsdorff, 2009). It explores the norms of behaviour triggered in corrupt agreements and proposes a method of representing social norm conflict and its resolution. That is, an individual in the model is not only guided by narrow self-interest, but also by observed behaviour of others and cultural and social expectations towards his/her behaviour.

This chapter is organised as follows. The next section provides a literature review. Section 6.3 sets out the model formulation. The model was then coded in Matlab and Section 6.4 shows the results of model simulations. Section 6.5 discusses how the model can be used to analyse repeated corrupt interactions, and Section 6.6 concludes.

6.2 Review of literature

6.2.1 Economic interests and temptation

Authors from the field of economics, including Rose-Ackerman, concede that social norms can be an important factor in corrupt agreements, but maintain that economic interests remain central to motivations behind corruption (Rose-Ackerman, 2010a). This section reviews literature on how economic interests motivate corrupt behaviour and how the bribe amount is decided upon.

According to corruption models based on Rational Choice Theory, an individual chooses corrupt actions if the rewards of doing so outweigh the costs (see Sections 2.3.1 and 2.3.4). Higher penalties for corruption and improved monitoring increase the risks corrupt officials are exposed to, leading to higher costs and lower expected rewards of corruption. This can reduce individual propensity to engage in corruption if bribe sizes are assumed to be fixed (Banuri and Eckel, 2012). On the other hand, it can also lead officials to increase the minimum bribe size they are willing to accept (Boehm and Lambsdorff, 2009), thus incorporating the costs of higher risks associated with corruption within the higher demanded bribe. Therefore, the bargaining power of officials in corrupt agreements plays an important role in determining the effectiveness of monitoring and punishment interventions.

Bribe payments can be thought of as compensation of officials for an illicit service they provide. Sizes of bribes, then, can be determined by a combination of the type of service provided and the service beneficiaries' willingness to pay for it. There is some evidence that the bribe size is dependent on the type of service provided by the official. For example, for some routine government functions, the bribes are relatively stable, and "price schedules" for bribes have been revealed through surveys and even published in newspapers (Rose-Ackerman, 1998). Kaufmann and Kaliberda (1996) report that in 1994 in Ukraine, the unofficial "fees" to obtain export and import licences averaged

$217 for export and $108 for import licences. The survey shows that over 90% of respondents paid these fees. Such routine nature of payoffs suggests a well-functioning and well-routed corrupt market, with each service having a stable price. In cases of infrastructure delivery contracts, the bribe is likely to be fixed to the value of the contract. For example, in Pakistan, contractors reported paying 7% "commissions" (Rose-Ackerman, 1998).

On the supply side of bribes, higher risk of corruption detection leads firms to expect higher returns on bribes paid, thereby reducing bribe sizes where the value of the illicit service is fixed (Warner, 2007, p.129). This factor can help explain what is often referred to as the Tullock paradox (Rasmusen and Ramseyer, 1994, Tullock, 1980): the values of advantages provided by officials are often disproportionately higher than the bribe sizes received. Rasmusen and Ramseyer (1994) focus on the example of lobbyists bribing legislators in return for their favourable vote on a statute. The authors suggest that one of the reasons behind small bribes in this case is the disadvantaged bargaining position of the legislators, with the lobbyists adopting a "take it or leave it" approach to offering a bribe.

In behavioural game theory, the Ultimatum game is an example where this "take it or leave it" factor in dividing some resource is analysed. The Nash equilibrium strategy of this game is to accept an offer of even the smallest proportion of the resource. Experimental results, however, reveal strong equal-payoff preference, with offers substantially smaller than half of the resource being rejected. This result is shown to be robust across different cultures (Bicchieri, 2006, p.104), with the exception of some cultures in Africa, the Amazon, Papua New Guinea, Indonesia, and Mongolia (Camerer, 2003, p.11), where fairness in division did not appear to be the guiding principle.

An experiment carried out by Gonzalez et al. (2007) applied the Ultimatum game to a bureaucratic corruption example, albeit the wording of the instructions was neutral, avoiding corruption terms. In this experiment, one

participant allocates shares of the profit between himself and another two participants. Either of the two respondents can decline the offer, and one of them has the additional power to cause delays and, therefore, impose costs on the profit distributor. Results of the study show a preference for equal sharing. Most frequent division choice was for an equal share of the profit to be allocated between the three participants. 40% chose to give a higher share to the participant with additional delay powers than to the other respondent. In 90% of cases where an equal share between the three participants was offered, it was accepted without any delay imposed.

Results of other experimental corruption games do not show the same level of inequality aversion as results of Ultimatum games. Drugov et al. (2014), Barr and Serra (2009) and Barr and Serra (2010) carried out an experiment with the same core structure, where participants playing the roles of officials were asked to state their Minimum Acceptable Bribe (MAB) in experimental monetary units. The mean stated MABs are below the payoff-equalising values for all three studies. The officials faced a cost for accepting a bribe. Drugov et al. (2014) report that 11% of participants stated MAB values below this cost, which means that they would accept a bribe that results in a lower payoff compared to if they rejected it. The authors explain this observation as a mistake on the part of the participants and omit the erroneous values from their statistical analysis. Barr and Serra (2009), Barr and Serra (2010) do not report such errors.

The ability of officials to correctly calculate the payoffs and establish the correct 'price' of the corrupt service is, therefore, questionable. Even when the payoffs from different strategies are known precisely, experimental participants can still set a minimum bribe value below their costs (Drugov et al., 2014). In repeated games with each round carrying a small (but known) probability of corrupt choices being detected, Abbink et al. (2002) show that participants significantly underestimate the overall probability of being caught. In reality, the risks, costs and benefits from corrupt agreements are not known.

6.2.2   Conflicting norms

According to Ostrom, norms of behaviour are prescriptions for individuals, defining required, acceptable or permissible actions, and such norms are the attributes of the community under investigation (McGinnis, 2011, Ostrom, 2005). For example, the norm of reciprocity is an important component of the collective action theory. Views on whether norms are reinforced through punishment vary across researchers. To Ostrom, norms do not contain a punishment clause. Instead, following a norm is intrinsically motivated, through feelings of guilt or shame for transgressions, and pride for adhering to it. On the other hand, Bicchieri posits that, for a social norm to exist, it requires for a sufficiently large number of people to adhere to it, and there is an expectation that an individual will follow the norm, or face punishment for transgressions (Bicchieri, 2006, p. 11).

Elster distinguishes between four types of norms, depending on what motivates norm conformity (Elster, 2007). Legal norms are enforced by specialised agents such as the police, and transgression carries risks of a tangible punishment (e.g. a fine in case of littering). Social norms, in contrast, are enforced through informal sanctions (e.g. ostracism for disobeying the rules of etiquette). Both legal and social norms are triggered when others can observe the actions of an individual, and compliance is motivated by the threat of formal or informal punishment. Moral norms are intrinsically motivated, and do not rely on individual's actions to be observed by others to create compliance. For example, the norm of helping others in distress is enforced by the individual's belief that it is the right thing to do. Finally, quasi-moral norms are triggered by an individual observing the actions of others. This type of norms includes reciprocity and cooperation.

An individual may face conflicting norms of behaviour. In cases leading to corruption, impartiality and the application of the arm's-length principle (see Section 2.2.1) required of public officials might conflict with their cultural

background, which might dictate that the interests of the closely-knit community take precedence over the interests of the wider population (Section 2.3.3). In such cases of norm conflict, the action will be chosen based on which norm of behaviour is supported by the strongest motivation (Elster, 2007, pp.89-93).

In formal models, norms can be incorporated into utility or payoff functions using a delta parameter, representing costs or benefits of following a norm (Ostrom, 2005, p. 212). Alternatively, a negative moral utility term can be added to the total utility function (Kuran, 1998). This method is used in micro-level models of corruption discussed in Section 2.3.4. An additional parameter often represents moral costs of engaging in corruption, but the source and the content of such costs are generally not explored further.

6.2.3   Negative externalities of corruption

Corruption creates an array of negative externalities. In cases of a corrupt acquisition of an infrastructure delivery project contract, for example, the more immediate costs are borne by the company which does not win the contract despite being the best candidate for the project. As outlined in Chapter 1, corruption in construction projects can exacerbate or even cause earthquake-precipitated disasters (Green, 2005) through lack of adequate engineering, industry inspection or quality assurance (Olson et al., 1999). In the longer term, corruption contributes to an increase in inequality and poverty (Gupta et al., 2002), it stifles economic growth (Mauro, 1995) and has been found to reduce expenditure on education and health (Mauro, 1998).

Social norms evolve through human interactions, experimentation and adaptation (Young, 2015). They are not designed specifically to regulate certain behaviour that causes harm to others. When it is established that certain behaviour causes a negative externality (imposes economic costs on others), social norms against this behaviour are unlikely to develop without prior intervention of specialist public organisations (Elster, 2007, p.359). First, legal

norms are created, enforceable by law, and then social norms can develop, ensuring compliance even in the absence of public law enforcement. For example, prohibition of smoking in public places is enforced by law in a number of countries across the world. Even if the law is repealed or is no longer enforced by public organisations, the social norms that developed can ensure continued compliance.

The effect of negative externalities on individuals' propensity to engage in corruption has been tested in psychological experiments. Abbink et al. (2002) test this effect in the context of cooperation and reciprocity between participants playing the roles of bribers and officials. Officials choose whether to accept a bribe, and whether to reciprocate with a favourable decision for the briber. The decision to reciprocate imposes a cost on all other experiment participants. The results show no effect of negative externalities on the proportion of officials choosing to reciprocate.

In contrast, Barr and Serra (2009) found that an increase in costs imposed on others reduced the number of participants choosing corrupt actions. Their experimental design differs from that of Abbink et al. (2002) in a number of ways. Firstly, Abbink et al. (2002) focus on the importance of trust and reciprocity in corrupt agreements, with negative externalities playing a lesser role. Barr and Serra (2009) simplify the game by reducing the choices of officials to acceptance or rejection of bribe offers only. If the bribe is accepted, it means that the favourable decision is provided automatically. Secondly, the participants in Abbink et al. (2002) study could both impose negative externalities and suffer them as a consequence of decisions made by other participants. Therefore, participants arguably had no reason to abstain from corrupt choices unless they believed that other participants would choose to abstain as well. Barr and Serra (2009) add a role of a passive member of society in their experiment, who cannot impose costs, but suffer negative externalities as a result of the choices made by officials and bribers.

Although Barr and Serra (2009) suggest that higher negative externalities are effective in reducing the incidence of corrupt choices, this effect is only significant for the bribers, not the officials. The experiment is run under two frames. One used neutral language; the other framed the game as corruption, using loaded terms, to elicit the framing effect on individual choices. Under the neutral frame, higher negative externalities led to a somewhat smaller proportion of officials choosing to accept bribes (reduction significant at 10% confidence level). When the corruption frame was used, an increase in the negative externality did not have an effect on the choices of officials.

The above studies suggest that negative externalities alone do not create strong motivations for individuals playing the role of officials to avoid corruption in experimental settings. This result supports the theory that negative externalities are not effective in creating self-motivation to avoid behavioural choices that harm others (Elster, 2007, p.359). That is, an external intervention is necessary to establish a system of legal norms, monitoring and punishment to regulate behaviour. Therefore, although negative externalities and social harm caused by corrupt agreements might logically be an important component for a social norm-based model of corruption, the above studies suggest that these factors do not play a significant role in decision making in corruption.

6.2.4   Separating the two corrupt acts

Chapter 4.3.4 outlined the two actions that constitute corruption by the public official (Decision Maker) in this thesis: 1) accepting an Incentive to violate the ALP; and 2) violating the ALP and providing an undue Advantage to the Candidate. The two actions are often perceived as linked and inseparable. However, the motivations behind the two actions – accepting a bribe, and providing something in return – are different. In its simplest form, the motivation behind accepting a bribe is self-interest, guided by economic considerations (discussed in Section 6.2.1). Providing an undue Advantage can be motivated by the norm of reciprocity in social exchanges (Abbink et al., 2002),

expectations of future lucrative agreements (Abbink, 2004), or fear of retaliation by the briber for reneging on the corrupt deal (Boehm and Lambsdorff, 2009).

The extent to which accepting bribes is considered inappropriate varies across countries and cultures. In some cases, traditional practices are given as a defence for accepting payments or gifts by officials. For example, in Korea, it is customary to give "chonji" (a token of appreciation) in business transactions (Sohail and Cavill, 2008). Officials can come under considerable pressure to accept payments (Oldenburg, 1987), creating an internal personal conflict. The civil servants' training may require them to decline offers of payments to uphold the public officials' professional legitimacy, but local cultural rules and practices may dictate that accepting such offers is necessary for the individual official's actions to be considered socially legitimate (Rose-Ackerman, 2010a).

Accountability rules and monitoring systems can be established, but their effectiveness can be undermined by tacit institutional approval of accepting bribes, supported by strong informal secretive practices (Sole, 2005). In some extreme cases, a social phenomenon of amoral familism may prevail, with the development of social norms against complying with the law (Elster, 2007, p. 99).

On the other hand, despite the cultural and institutional pressures to accept bribes, an individual official may have strong intrinsic motivation to avoid corruption. This raises the question of what the source of this intrinsic motivation is. The laboratory experiment in Barr and Serra (2010) suggests that cultural background plays an important role in decisions involving corruption. The study concluded that individuals from countries with high prevalence of corruption are more likely to accept bribes. However, socialisation into the adoptive culture with low levels of corruption also played an important role, with the propensity to accept bribes reducing as the number of years spent in the low-corruption country increased.

Barr and Serra (2010) argue against holding preconceptions regarding individuals' propensity to be involved in corruption based solely on their cultural background. The study points to the importance of assimilation effects in reducing individual's propensity for corruption. However, this effect can also account for the reverse tendency. That is, an individual with strong intrinsic motivation against accepting bribes placed in a high-corruption environment can be expected to adjust to the new status quo. Indeed, the importance of the assimilation effect revealed by the study supports the view that corruption can only be poorly explained by rational utility- (or payoff-) maximising agents. Examples of alternative models of behaviour that may be better-suited are based on interactions between rule-driven individuals (Hodgson and Jiang, 2007, p.1051) or imitative behaviour (Cartier–Bresson, 1997, p.470).

This rule-driven or imitative behaviour mechanism is adopted in this chapter for modelling decisions of whether to accept a bribe. Group behaviour status quo and the pressure to conform can play a large part in determining individual choices. In the model developed in Section 6.3, the assumption is made that a large proportion of the group must comply (or thought to comply) with certain expected norm of behaviour for an individual to choose to comply. However, other factors can tip the balance in favour of an action contrary to the group behaviour status quo. This is discussed further in Section 6.3.

Turning to the choice of whether to reciprocate the bribe with an undue Advantage, analyses offered in past literature often focus on three main factors. The first is the possibility of retaliation if the official decides to accept the bribe and provide nothing in return. Corrupt agreements are illicit, and parties cannot turn to legal means of enforcement. However, credible threat of violence can be used to ensure that the other party fulfils their side of the agreement (Boehm and Lambsdorff, 2009). For example, criminal organisations with reputation for violence might act as enforcement agencies of corrupt agreements.

The second factor is the reputation for reneging on a deal. Although reputation is difficult to establish in bribery markets because they are secretive in nature, with past actions of individuals rarely known by others (Rose-Ackerman, 1998), it is an important factor in repeated interactions. If the DM reneges on a corrupt deal, future lucrative corrupt offers are unlikely to be forthcoming from the same bribe-giver.

The third factor is expectations of reciprocity and the importance of trust relationships. Corrupt agreements are often based on trust and rely on goodwill of the corrupt partner to uphold their end of the deal. In experimental bribery games, participants who received transfers from their partners in the experiment decide to reciprocate, even where there are no consequences for reneging, and despite negative externalities imposed on other participants from this reciprocity (Abbink et al., 2002). The model in this chapter further explores the nature of this motivation to reciprocate in the absence of other factors that can enforce compliance with the agreed corrupt deal.

6.2.5   Institutional rule legitimacy

Corruption thrives in certain institutional environments. For example, in organisations with unfair practices towards employees, or where job satisfaction levels are low, emotional responses can give rise to uncoordinated unethical behaviour and corruption (Carvajal, 1999). This type of corruption is termed the Organisation of Corrupt Individuals (OCI) analysed by Pinto et al. (2008) (see Section 2.3.5). Alternatively, the rules and the structure of the institution may have been put in place in order to facilitate corruption (Kaufmann and Vicente, 2011). This gives rise to Corrupt Organisation (Pinto et al., 2008), and corruption is written into the very constitution of the organisation.

Corrupt practices are thought to undermine institutional rule legitimacy (Thompson, 2013), and illegitimate institutional rules are unlikely to be followed.

This raises the question of what the characteristics of legitimate institutions and legitimate institutional rules are.

One of such characteristics is consistency with the wider culture of the society. If formal rules of institutions clash with society's traditions, they are less likely to be adhered to. As discussed in Section 6.2.4, the ideals of the arm's-length principle, or impersonal, professional interactions may not be easy to introduce and sustain in the presence of traditional practices of personalistic modes of interaction (Rose-Ackerman, 2010a). Despite the efforts to enforce these institutional rules, they may be disregarded and misconduct carefully swept under the carpet. That is, collusive behaviour between agents may arise to sustain the system of implementation of unspoken rules. Individuals use "focal points" (rules of thumb) when in doubt about making or justifying a decision (Young, 2015). These focal points evolve over time, and any anti-corruption efforts undertaken within institutional contexts should be designed with due regard to the gradual nature of institutional culture change.

As discussed in Sections 4.3.2 and 4.3.7, the development of rules and regulations can be affected by corruption. This means that there is potential for designing vulnerability into rules, and creating loopholes for providing advantages to particular interest groups legally. For example, a model by (Kaufmann and Vicente, 2011) suggests mechanisms for elite's decision-making when faced with a problem of whether to create systems that make some forms of corruption legal. Therefore, the development of legitimate institutional rules is unlikely to arise if constitutional or collective-choice levels of activities (see Table 3 in Section 4.3.2) are exposed to corrupt practices and if the impartiality of rule development is in doubt.

The right level of discretion over implementation of rules is also an important factor. As discussed in Section 2.3.4, discretionary powers in application of rules is important in agency relationships (Groenendijk, 1997, Boehm and Lambsdorff, 2009). The agent possesses information not readily available to

the principal, and the latter relies on the former to use his/her judgement in the application of rules. This existence of discretionary powers of officials over the rules they are entrusted to apply is sometimes thought to be one of the necessary conditions for corruption to occur (Aidt, 2003, Rose-Ackerman, 1998).

However, elimination of discretion is not a cure for corruption. If rules become rigid and overly specific, this creates a complex bureaucracy that is more difficult to manage and agents' conduct becomes harder to monitor. Bureaucrats can then extract rents in exchange for helping to evade rigid rules that act as inefficient barriers for companies (red tape). One of the purportedly 'redeeming' features of corruption is that is can increase efficiency in the context of government-imposed rigidities that stifle economic growth (Leff, 1964, Huntington, 2006).

This is not to say that reduction or elimination of rules is the solution. If the rules are too vague, the benchmarks against which to hold agents accountable are erased. To monitor behaviour, it is important to know what performance is expected from agents, and agents should be clear about the conduct expected from them.

As discussed in Section 2.4.6, individuals internalise and adopt organisational rules or societal values if they agree with them. A certain amount of autonomy is an important factor in promoting intrinsic motivations to follow the rules and maintain self-control (Lange, 2008). Enforcement of strict rules and high penalties for misconduct can produce negative effects. Introduction of draconian systems of punishment can reduce intrinsic motivation to self-regulate and self-govern within the industry (Frey and Jegen, 2001). External interventions crowd out intrinsic motivation if individuals perceive them as controlling, but crowd in intrinsic motivation if individuals perceive them as supportive (Frey and Jegen, 2001, Ostrom, 2005, Ch.4).

The above factors, consistency with the wider culture, impartiality in rule development, and the appropriate level of discretion in rule application are a few of the characteristics of what is understood by legitimate institutional rules. The extent to which institutional rules are perceived to be legitimate is context-dependent and relies on a variety of other factors. What is important for the model developed in the next section is whether the DMs who are entrusted to implement the rules perceive them as legitimate.

6.3   Model formulation

The model is based on choices of a DM faced with a corrupt offer in an infrastructure project bidding setting. A government decision maker (DM) responsible for choosing a company to carry out an infrastructure project is offered a bribe by a Representative of one of the companies (Candidate). The first choice facing the DM is whether to accept or reject the offer. If the offer is accepted, he decides whether to provide the Advantage the company seeks.

There are a number of ways a government decision maker can provide an Advantage to a particular company in the context of tendering procedures. Examples include providing one company with information on the content of another company's bid; accepting a bid from a company known to have previously failed to comply with industry standards; or manipulation of tender processes to favour a particular company (GIACC, 2008). These are the types of actions that constitute violation of the ALP in the model.

There are several relevant factors for each of the two decisions the DM faces (accepting or rejecting a bribe, and reciprocating with an Advantage or not). The model focuses on two factors for each decision. When the DM decides whether to accept a bribe offered to them, the first relevant factor is the group behaviour status quo regarding accepting bribes. Assuming that there are existing norms against accepting bribes, this factor weighs against DM's

decision to accept the bribe. The weight of this factor (denoted w_i) relative to other factors depends on whether or not anti-corruption norms of behaviour are followed by DM's colleagues. Therefore, the weight of anti-corruption norms for the DM's decision of whether to accept a bribe is determined by the proportion of civil servants accepting bribes (p_1). This proportion does not have to be known with certainty. What matters is the DM's estimation or perception of how many colleagues are taking bribes. The model does not consider punishment for not following the norm. It follows Ostrom's view that norm compliance is intrinsically motivated (see Section 6.2.2).

The second factor is self-interest. Even in low corruption environments, bribe-taking can occur, where the temptation of self-enrichment outweighs other factors. The weight of this factor depends on the size of the bribe offered (p_2), and the higher is the bribe, the more this factor weighs on the side of accepting the bribe. As discussed in Section 6.2.1, Minimum Acceptable Bribes (MABs) can vary with the type of a corrupt 'service' provided, the bargaining power of the officials, and penalties for corruption. Additionally, bribes can be determined through market-type bribe supply-demand equilibrium, or through equal sharing of economic rents from corruption. However, even in laboratory experiments, with payoffs known or calculable, some participants choose bribe acceptance even if the payoff is lower than if they refused the bribe. Therefore, the bribe size is represented in this model in a simple form, without linking it to other factors such as the nature of the corrupt service.

Similarly, there are two factors relevant to the decision of whether to reciprocate with the Advantage the Representative seeks for the Candidate. On the one hand, once the bribe is accepted, there are expectations from the side of the Representative that the DM will reciprocate with the Advantage. These expectations can be thought of in terms of fulfilment of a promise that was made by accepting a bribe. If the corrupt Incentive is framed as a bribe, the agreement is akin to an informal contractual agreement. If the offer is framed as a gift, the

relevant social norm is that of reciprocity. Either way, the social expectations weigh on the side of providing the Advantage. The weight of this factor depends on the strength of the pre-existing social connection between the Representative and the DM (p_3). In cases where there are no pre-existing connections, the DM might not have a strong aversion to reneging on the deal, except for intrinsic motivations to carry out the promised actions. However, if the social connection is strong, the social expectation of reciprocity is a factor that would be given higher weight.

On the other hand, providing an unfair Advantage means violating the Arm's-Length Principle. The ALP dictates that "personal or other relationships should play no part in the economic decisions that involve more than one party" (Begovic, 2005, Tanzi, 1996). In this case, if the DM provides an unfair Advantage to the Candidate because of the corrupt agreement made with the Representative, they allow this agreement to take precedence over their formal role and duties in the infrastructure delivery process. The DM's neutral and unbiased compliance with the rules and procedures of the institution they work for relies on the rules themselves being appropriate and legitimate. As discussed in Section 6.2.5, if the rules have been designed to unfairly favour certain groups, this delegitimises the process and can undermine the potency of the ALP. Therefore, ALP as a factor weighing against providing an unfair advantage to the Candidate depends on how legitimate the institutional rules are. Table 4 summarises the factors relevant to DM's choices and the determinants of the factors' weights.

Table 4 Factors relevant to DM's choices and the determinants of factors' weights

Actions constituting corruption	Factors (i) relevant to decisions regarding actions	Factor (i) for/against the action	Determinant of factor's weight (w_i)
Accepting a bribe	1) Group behaviour – norms against accepting bribes	Against	Proportion of civil servants accepting bribes (p_1)
	2) Self-interest	For	Size of bribe (p_2)
Reciprocating by providing an unfair advantage and violating the arm's length principle (ALP)	3) Social expectations and norms of reciprocity	For	Strength of social connection with the individual offering a corrupt deal (p_3)
	4) Arm's-Length Principle	Against	Legitimacy of institutional rules (p_4)

The model is based on the DM weighing up the conflicting factors relevant to their decisions. The conflict is between:

1. The norms against accepting bribes (Factor 1) on the one hand and self-interest (Factor 2) on the other; and

2. The norms of reciprocity (Factor 3) on the one hand, and the ALP (Factor 4) on the other.

This is represented as a discrete choice problem with three end-states:

s1. The offer is rejected by the DM

s2. The offer is accepted, the Advantage is provided

s3. The offer is accepted, but no Advantage is provided.
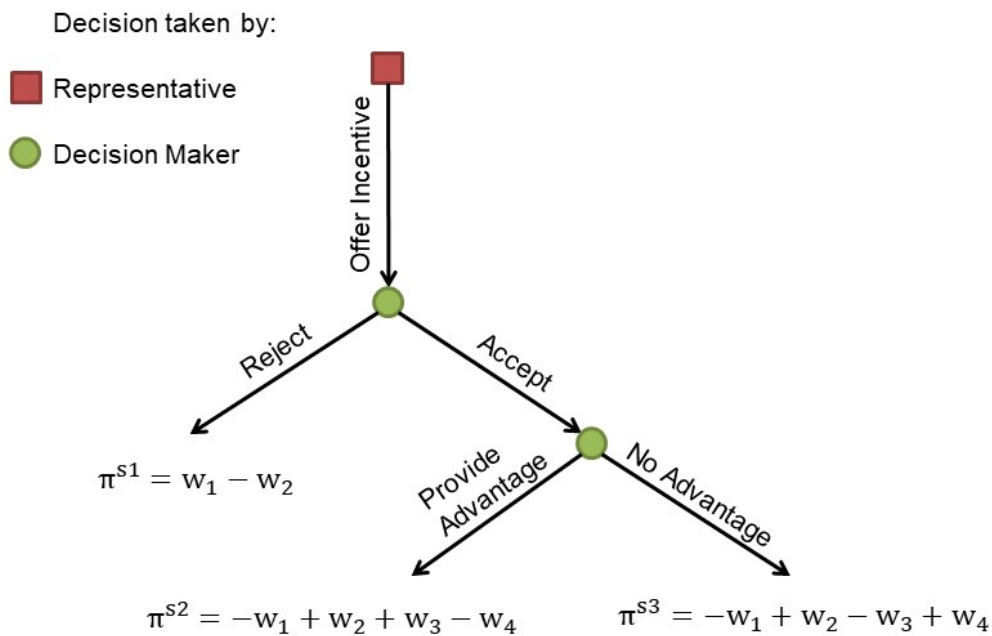
Figure 9 shows the decision tree.

Figure 9 Model decision tree with payoffs π

The payoff in each State s represents the aggregated weights of the factors relevant to the decision taken:

$$\pi^s = \sum_i l_i^s N_i w_i \tag{E6.3.1}$$

144

where l_i^s takes value 1 if Factor i is relevant to the actions preceding State s and 0 otherwise. N_i takes the value of -1 if the factor is against the action taken, 1 otherwise. For example, if the DM rejects the bribe, they act in accordance with Factor 1 (norms against accepting bribes), but against temptation or self-interest (Factor 2). Therefore, in Figure 9, the weight w_1 in payoff of State 1 is positive, and the weight w_2 is negative. If, however, the DM decides to accept the bribe, this is against Factor 1, but it follows self-interest and temptation (Factor 2). The signs of the two weights are reversed in the payoff of State 2.

Factor weights w_i are continuous variables. These depend on the proportion of other civil servants accepting bribes (for Factor 1); the size of the bribe offered (Factor 2); the strength of the social connection with the individual with whom the civil servant made a corrupt agreement (Factor 3) and the legitimacy of institutional rules and procedures (Factor 4) (see Table 4).

The model functions specifying the relationships between factor weights w_i and their determinants p_i vary across the four factors. The extent to which self-interest (Factor 2) plays a part in the decision of whether to accept the bribe depends on the size of the bribe. The higher the bribe, the higher is the temptation to accept it, and, hence, the higher weight given to this factor. However, in accordance with economic theory, it is expected that at certain bribe sizes, an additional monetary unit will matter less. For example, consider an increase in the bribe by £100 if the bribe is initially set at £1,000, compared with £1 million. In the second case the additional £100 will matter less. Therefore, the function specifying the relationship between the weight of self-interest and its determinant, the size of the bribe, will be modelled after the economic individual utility function, exhibiting diminishing returns to bribe size.

It is more difficult to specify functional relationship between the weight of reciprocity or social expectation norms (Factor 3) and the strength of social connection because this relationship has not been as widely discussed, and

there is no known comparative concept to the individual utility function. For the purposes of this model, the same functional relationship will be assumed for Factor 3 as for Factor 2. That is, in this model, the DM has a stronger motivation to reciprocate the received bribe with an Advantage if there is a stronger pre-existing connection with the Representative, but as the connection becomes stronger, the increase in the weight given to reciprocity exhibits diminishing returns to increased social connection strength.

The relationship between the weight of Factor 1 (norms against accepting bribes) and its determinant (proportion of DMs accepting bribes) is different to the above. At low levels of bribe acceptance, the weight of conforming with the norm is high. However, as the proportion of bribe takers increases, the motivation to reject bribes falls at an increasing rate. Analogously, if the proportion of bribe takers is high, the motivation to abstain from corruption is low. As more DMs abstain from corruption, individual DMs feel stronger motivation to abstain, but it grows slowly at first, and at a faster pace when a certain proportion follow the norm of not accepting bribes. This functional relationship is better captured by a sigmoid function (set out later in this section).

Similarly, following the ALP relies on legitimate institutional rules. At low levels of legitimacy, the motivation to follow the ALP is low. A small improvement in the institutional rules will make little difference to the motivation to follow and uphold them, but at certain levels of legitimacy the motivation becomes increasingly stronger. The relationship between Factor 4 (ALP) and its determinant (legitimacy of institutional rules) is, therefore, also captured by a sigmoid function.

These four functional relationships are specified as follows:

$$w_1 = 1 - \frac{2}{2 + e^{(-ap_1 + 5)}} \qquad \text{(E6.3.2)}$$

$$w_2 = \frac{\ln(p_2+b)}{c} + 1 \qquad\qquad (E6.3.3)$$

$$w_3 = \frac{\ln(p_3+d)}{g} + 1 \qquad\qquad (E6.3.4)$$

$$w_4 = \frac{2}{2+e^{(-hp_4+5)}} \qquad\qquad (E6.3.5)$$

where

p_1 is the proportion of civil servants accepting bribes

p_2 is proportional to the size of the bribe

p_3 is the strength of social network connection

p_4 is legitimacy of rules of the institution

a, b, c, d, g and h are constants

Functions in equations E6.3.2 and E6.3.5 are sigmoid and E6.3.3 and E6.3.4 are logarithmic, as shown in Figure 10.
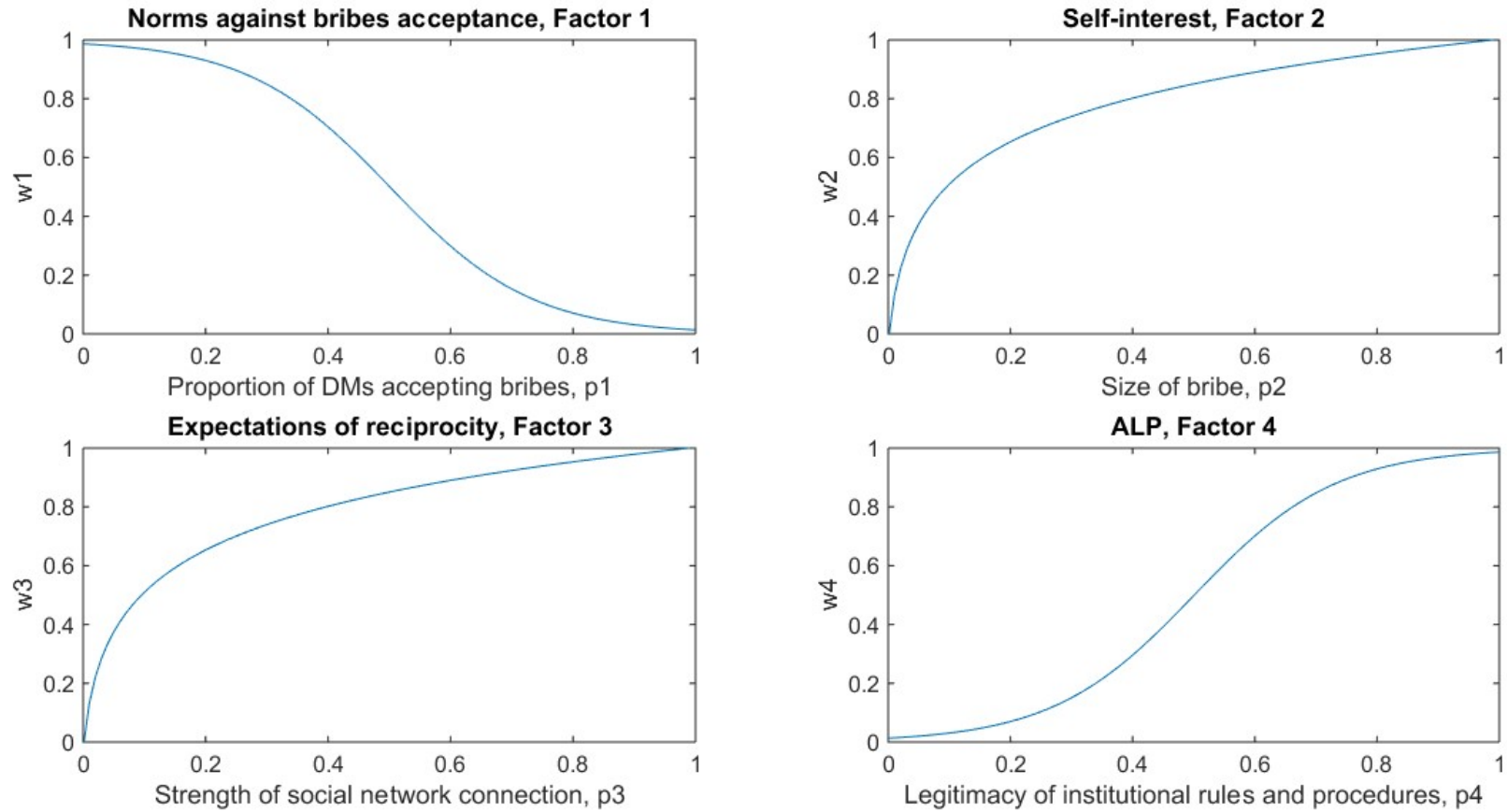
Figure 10 Functions in equations E6.3.2 to E6.3.5 showing relationships between weights of relevant factors affecting DM's decisions (w1, w2, w3 and w4) and determinants of factors' weights (p1, p2, p3 and p4).

Figure 10 shows the functions in equations E6.3.2 to E6.3.5 with the constants set as follows:

a=8.6; b=0.01; c=4.5; d=0.01; g=4.5; h=8.6

The functions are stylised examples of what the relationships between the variables could be, and are used to illustrate how the model works. The constants used in Figure 10 and in the simulations below were chosen because the resulting functions fit a number of criteria. First, the shapes of the functions fit the discussion above: two are sigmoid, and fit the intuition of how the motivation to follow group norms depends on the proportion of others following the norm; and two are logarithmic, resembling the individual utility function.

Secondly, the model considers values of w_i and p_i between 0 and 1 ($w_i \in [0\ 1]$ and $p_i \in [0\ 1]$). So, for example, as p_1 approaches 1 (almost all DMs accept bribes), the payoff of upholding the norm of not accepting bribes tends to 0. This represents the tendency to follow status quo in groups. Similarly, following the ALP in an institution the rules of which are not considered legitimate (p_4 approaching 0) returns 0 payoff. The constants were also chosen in such a way that the sigmoid functions appear symmetric, going through the point close to (0.5; 0.5).

The motivation to follow self-interest is a logarithmic function of the size of the bribe, exhibiting diminishing returns, with the bribe size of 0 translating into Factor 2 weight of around 0, and the largest bribe size (set to 1 in the model) translates into factor weight of around 1. Similarly, the strength of the motivation to uphold the norm of acting to agreements (or the reciprocity factor) increases in the strength of social connection, at a decreasing rate.

If constants b or d were set to 0, factor weights at $p_2 = 0$ or $p_3 = 0$ would be undefined or $-\infty$ (minus infinity), which can present problems when running the

model, with payoffs calculated as -∞ for some combinations of variables. Setting d=0.01 prevents this problem and allows the model to be used to consider how corrupt agreements between strangers might be created. Alternatively, the constant can be set at b=0.02 or above. This would mean that following on promises of an Advantage is inherently important for the DM even if there is no pre-existing social network tie. The weight of Factor 3 (meeting the expectations of reciprocity) would then be greater than 0 even for $p_3 = 0$. This raises the question of how important it is to keep promises, and how this can be represented within the model. This is kept outside the focus of the model, and, therefore, constant d is set at 0.01.

6.4 Model simulations

The model is coded in Matlab and run to illustrate its functionality. Each variable p_i is drawn randomly from a uniform distribution 1000 times for each simulation. The first simulation uses a simplified version of the model, limiting the choices of the DM to either accepting or rejecting the bribe offer. This simulation only considers 2 factor weight determinants: the proportion of other DMs accepting bribes and the size of the bribe. The second simulation includes all factors discussed in Section 6.3 and shows how the simulated choices of the DM are split between rejecting the bribe, providing the Advantage or reneging and not providing the Advantage. The Matlab scripts are provided in Appendix C.

Figure 11 shows results of the first simulation. The bribe is set to be accepted in the model where the payoff of rejecting is larger than or equal to the payoff of accepting: $\pi^{\text{Reject}} \geq \pi^{\text{Accept}}$, where π^{Reject} is the same as the payoff in end-State 1 in Figure 9, $\pi^{\text{S1}} = w_1 - w_2$, and π^{Accept} is a simplified payoff of end-State 2, omitting $w_3 - w_4$: $\pi^{\text{Accept}} = -w_1 + w_2$.

The number of rejected bribe offers in this simulation is 273, with remaining 727 model runs returning the result of an accepted bribe. This rejection rate is

determined by the specifications of functions set out in Section 6.3. It is also the result of taking into account only two factors (norms against accepting bribes and self-interest), disregarding the expectations of reciprocity and the decision of whether to violate the ALP following bribe acceptance.
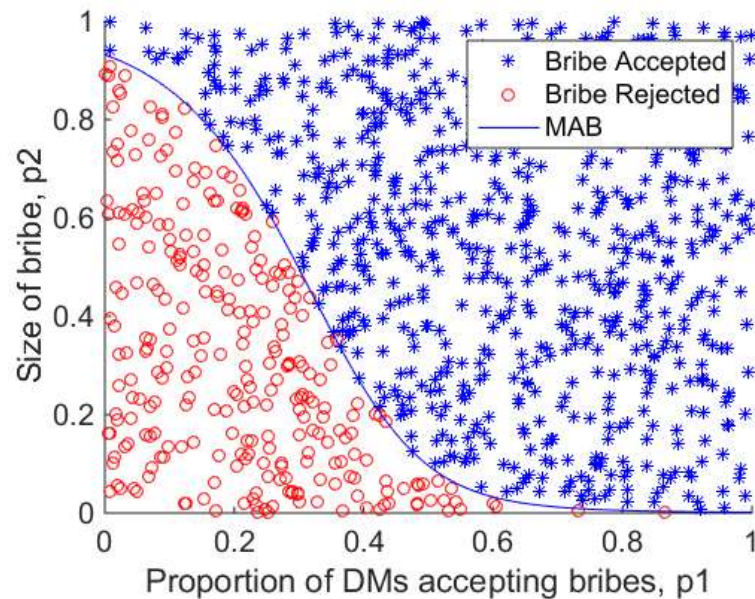
Figure 11 Results of simulation 1

The red circles plot the rejected bribe sizes (y-axis) according to how prevalent bribe taking is simulated to be (x-axis). Unsurprisingly and intuitively, low bribes in low-corruption environments are rejected. Even where the proportion of DMs accepting bribes is high (around 0.8 in Figure 11), a few of the lowest bribes are rejected. The blue stars plot the accepted bribes. These show that the model accounts for instances where even in low-corruption settings ($p_1 < 0.2$), high bribes may still be accepted.

The blue line separating the areas with rejected and the areas with accepted bribes shows the Minimum Acceptable Bribe (MAB) levels. This is set in such a way that $\pi^{\text{Reject}} = \pi^{\text{Accept}}$ and re-arranged to make p_2 the subject. This line

traces the lowest level of bribes that would be accepted for each corruption level in this simulation.

Figure 12 shows the results of the second simulation, using the full model developed in Section 6.3. The choices between rejecting the bribe, accepting and providing the Advantage, or accepting and providing no Advantage are based on the highest payoff of the end-states under parameters generated for each iteration. As previously, p_i are generated randomly 1000 times. There is a lower number of rejections – 193, compared with 273 in the first simulation. Out of 807 accepted bribes, 622 were simulated to be reciprocated with the Advantage (plotted with blue stars) and 185 were not (plotted with green crosses).
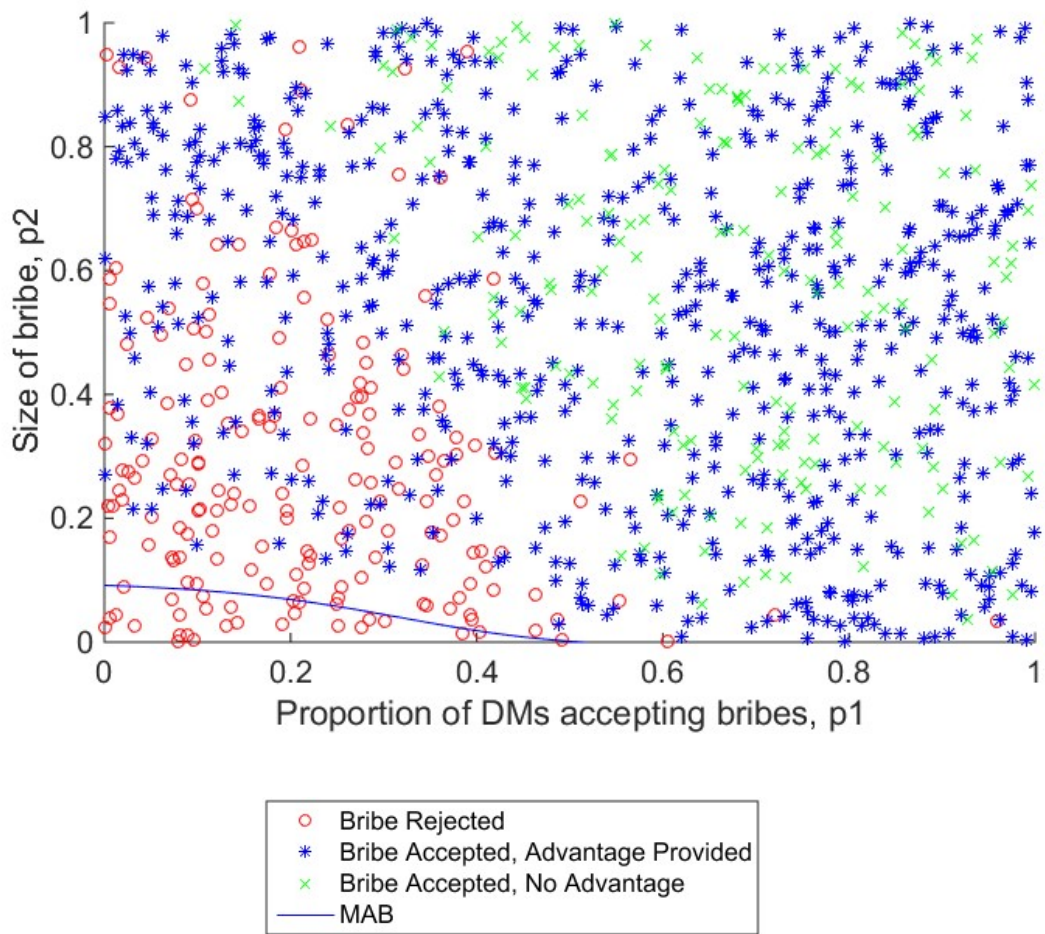
Figure 12 Results of simulation 2

The Minimum Acceptable Bribe (MAB) for this simulation is much lower than in simulation 1, and is shown in the bottom left corner of Figure 12.

The MAB is plotted setting $p_3 = 1$ and $p_4 = 0$. It shows the lowest levels of bribes that could be accepted in the model are where the institutional legitimacy is low ($p_4 = 0$), and the social connection is strong ($p_3 = 1$). Any value below this line would be rejected in the model.

To illustrate the lowest bribes that would be accepted in the simulation under different conditions, the model was run setting variables p_3 (social connection

strength) and p_4 (legitimacy of institutional rules) to extreme values of 0 or 1. Figure 13 shows the results.
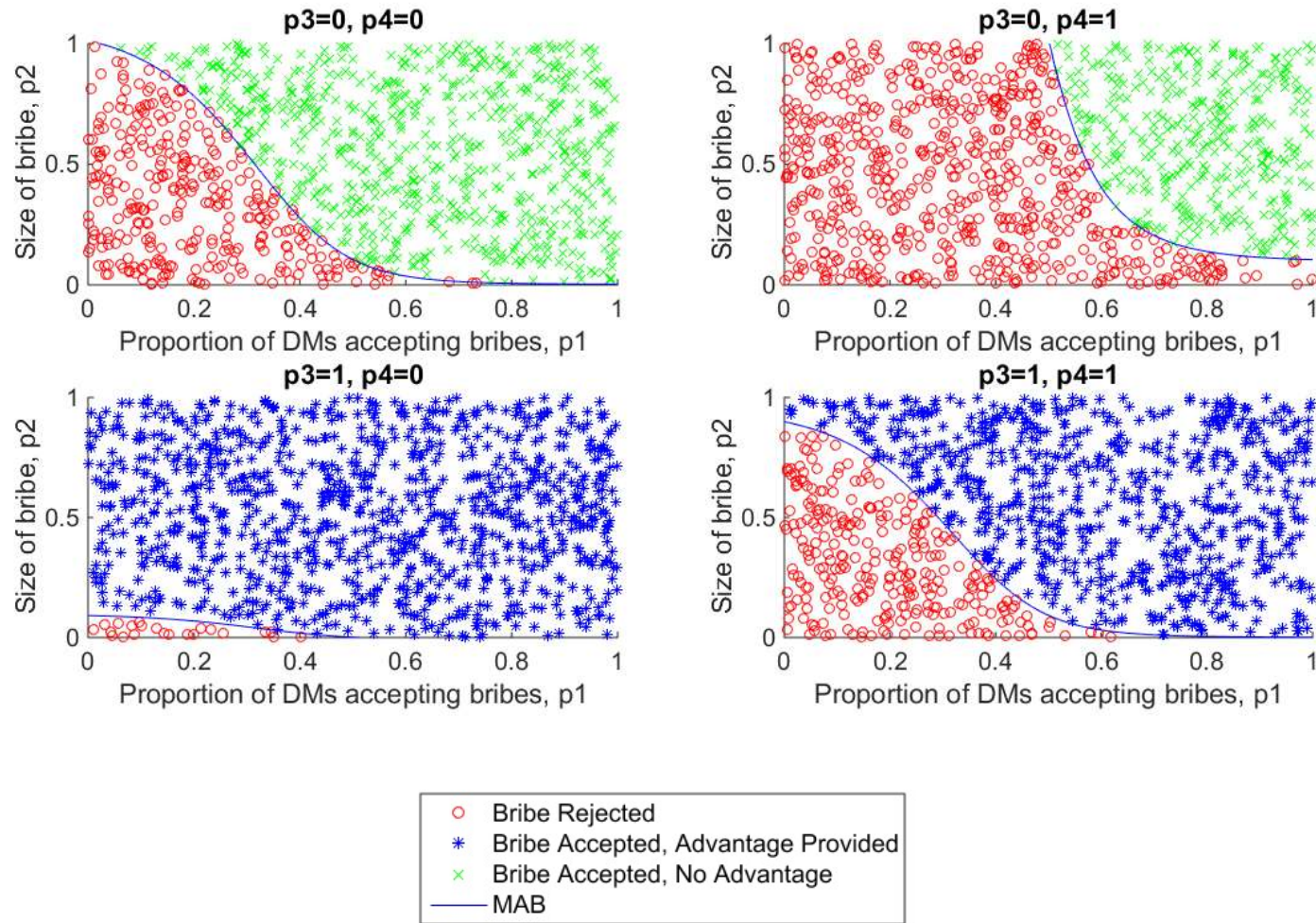
Figure 13 Simulation 2 Minimum Acceptable Bribes

Setting p_3 and p_4 to extreme values pre-determines the outcome in terms of whether an Advantage would be provided. Top two graphs show that under the model formulation, if there is no pre-existing connection between the DM and the Representative, any accepted bribe offer is reneged on, and the Advantage is not provided, regardless of the legitimacy of the organisational rules.

A strong pre-existing connection ($p_3 = 1$, bottom two graphs) produces no opportunistic behaviour from the side of the DM, and the bribe is always reciprocated with an Advantage.

The MAB is the highest in the simulation with no pre-existing connection ($p_3 = 0$) and with high institutional rule legitimacy ($p_4 = 1$) (top right graph). The MAB is lowest if the connection is strong and the institutional legitimacy is weak (bottom left graph).

6.5   Discussion

The simulations in Section 6.4 are based on individual corrupt agreements, with variables drawn randomly from a uniform distribution. The simulations are based on the assumption that this is the first corrupt agreement between the Representative and the DM. The two may have a pre-existing social connection ($p_3 > 0$), but each iteration considers a new set of variables, therefore it does not allow for the analysis of how corrupt relationships may develop over time and with each new corrupt agreement between the same pair of actors. This section discusses how the model can be adapted to make it dynamic.

The model is based on a conflict of norms of behaviour with other factors such as self-interest and the motivation to follow the ALP. In the first instance, the DM makes an initial assessment of the situation. They form a belief of how prevalent bribe-taking is in their organisation, and they weigh it against the size of the bribe offered. They then make an assessment of how legitimate the

156

institutional rules they are expected to follow are, and weigh this factor against the strength of their social connection with the Representative, and whether they are prepared to renege on the deal.

Whatever the chosen action is, individuals might subconsciously search for after-the-fact justifications for their actions. Cognitive dissonance theory suggests that when faced with conflicting motivations, with one being slightly stronger, individuals subconsciously search for further arguments in favour of this slightly stronger motivation (Elster, 2007, Chapter 4). If an action that might be considered wrong or immoral has already been taken, an individual may search for justifications that lessen the feelings of guilt. This can mean re-assessing their initial estimation of the factors relevant to the decision.

So, if the initial assessment leads the DM to accept the corrupt offer and provide the advantage, cognitive dissonance might lead them to re-evaluate the state of the relevant factors after they made the decision. For example, they may increase their initial assessment of the proportion of other DMs accepting bribes from, say, 20% to 40%. The DM may also re-evaluate how legitimate the rules of the institution are, to support the decision of circumventing the rules and violating the ALP.

In addition, a successful corrupt agreement might increase the strength of the social connection between the DM and the Representative. This is because the bribe given by the Representative required them to place trust in the DM. As the DM reciprocated with the Advantage, this trust was met, and the DM upheld his/her end of the deal.

Figure 14 shows how the weights of the four factors of the model can change in a dynamic model of repeated corrupt interactions between the same pair of a DM and a Representative. First, the DM's estimation of the proportion of other DMs taking bribes (p_1) can increase, thus reducing the weight of the norm against bribe acceptance. Second, the strength of the social connection

between the DM and the Representative (p_3) can increase, and more weight will be given to the norm of reciprocity in future corrupt agreements between the two. Third, the DM's assessment of the institutional rule legitimacy can decrease, with less weight being given to the ALP.

The above changes will, in turn, have an impact on the minimum levels of bribes the DM will be prepared to accept. Figure 15 shows an example of how the Minimum Acceptable Bribe can reduce as corrupt relationships evolve. A combination of parameters was chosen from one of the iterations of the second simulation of Section 6.4 that produced the result of bribe acceptance with Advantage provided: $p_1 = 0.0034$; $p_3 = 0.6446$; $p_4 = 0.4889$. For each iteration n, p_i were changed by a small amount:

$$p_{1_{(n)}} = p_{1_{(n-1)}} + 0.05$$

$$p_{3_{(n)}} = p_{3_{(n-1)}} + 0.05$$

$$p_{4_{(n)}} = p_{4_{(n-1)}} - 0.05$$

with initial values of p_i set at $p_1 = 0.0034$; $p_3 = 0.6446$; $p_4 = 0.4889$.
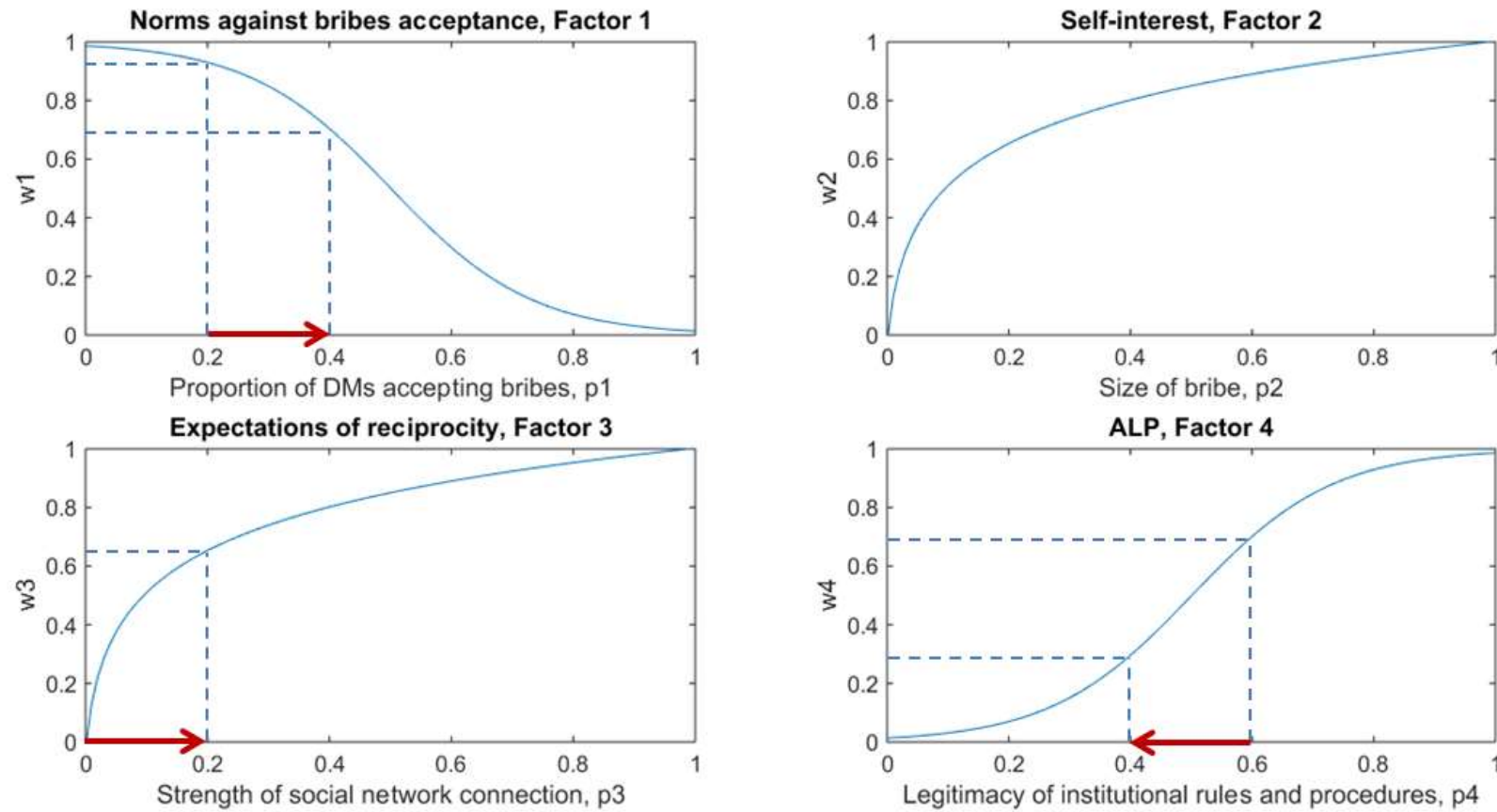
Figure 14 Change in variables p1, p3 and p4 after the first successful corrupt agreement
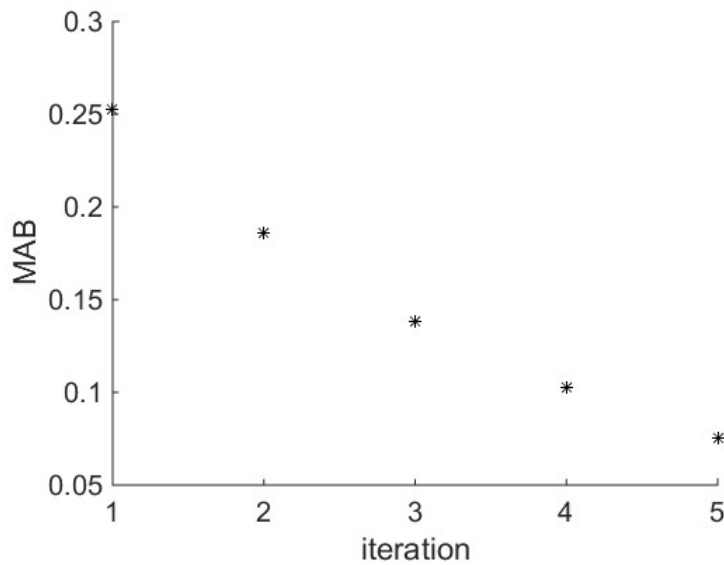
Figure 15 Changes in Minimum Acceptable Bribes (MAB) in repeated corrupt agreements

Hence, Figure 15 shows how the minimum acceptable bribes could decrease with each new corrupt agreement between the same pair of a DM and a Representative, following the first successful corrupt agreement.

6.6   Conclusions

This chapter addressed the second question of the thesis: How do social norms affect bribe-takers' choices? Section 8.2 later in the thesis discusses the method used to develop the model in this chapter and Section 8.3 also revisits the components that formed the basis of the model.

This chapter presents a model of a DM's decision-making processes when they are offered a bribe by a company Representative bidding for an infrastructure contract. It explores the norms of behaviour triggered in corrupt agreements and proposes a method of representing social norm conflict and its resolution. That is, an individual in the model is not only guided by narrow self-interest, but

also by observed behaviour of others and cultural and social expectations towards his/her behaviour. For the corrupt Incentive to be accepted, the weight given to the temptation (or self-interest) factor has to be higher than the weight given to the norm of not accepting bribes. The first depends on the size of the bribe, and the second varies with the proportion of other DMs accepting bribes. For the DM to reciprocate with an Advantage, the weight given to the ALP must be lower than the weight given to the norm of reciprocity (or following on promises). These two factors depend on the legitimacy of institutional rules (for ALP) and the strength of the social connection between the DM and the Representative (for the norm of reciprocity).

The functional relationships between factor weights and their determinants are hypothetical, and are used to illustrate how the model works. Calibration of the model would require a detailed dataset of individuals' choices under different conditions, with varying degrees of prevalence of corruption, varying bribe sizes, under 'strangers' and 'friends' protocols, and under varying levels of institutional rule legitimacy. As the model is based on intrinsic motivations, some measurement of the level of internal conflict would also be required. An example of past experimental studies examining human behaviour in the context of conflicting motivations is Jaber-López et al. (2014). This study measures physiological responses (electrodermal responses) when participants make decisions in corruption experimental laboratory games. Although the assumptions of the study are different from the assumptions of the model in this chapter, this study shows an example of the method that could be used to create a dataset that in turn could be used to develop the model in this chapter further.

However, the basic assumptions behind the model and the functional relationships between the factors considered and their determinants are based on past studies and theories, and are intuitive: higher bribe offers give rise to higher temptation, anti-corruption norms are unlikely to be followed by an

individual who believes that a large proportion of others accept bribes, etc. Therefore, even without calibration, the model in this chapter provides a number of insights. It shows that in institutions with low legitimacy and high corruption prevalence, lowest bribes might be accepted when the agreement is made between individuals with strong social connection. Where there is no pre-existing connection, the bribe-taker is more likely to renege on the promises, especially if the rules of the institution are legitimate. The model also shows how repeated corrupt agreements between the same pair of individuals can result in progressively smaller bribe sizes.

The model is based on intrinsic motivations, and does not account for extrinsic motivators such as the possibility of punishment for accepting bribes or retaliation tactics by the Representative if the DM behaves opportunistically and reneges on the deal after accepting the bribe. These factors can be included in the model by developing additional factor weights and setting out the functional relationships between the weights and their determinants. However, such a model would require a detailed understanding of how intrinsic and extrinsic motivators interact to bring about certain behaviour, which is not currently well-understood.

7 Corruption in infrastructure projects. Case studies

7.1 Introduction

As discussed in Chapter 1, the specific area of interest in this thesis is corruption in relation to the procurement of infrastructure. The third question of the thesis set out in Section 3.2 is as follows: What are the characteristics of corruption specific to the infrastructure sector and what measures of corruption reduction can be effective in this sector? This chapter addresses this question and presents case studies developed using the documentation filed in support of the prosecutions of companies and individuals under the US Foreign Corrupt Practices Act 1977. The court case documentation describes corrupt schemes across the world, and case studies developed focus on examples of infrastructure-related projects that were subject to corruption.

The chapter is structured as follows. Section 7.2 summarises the objectives fulfilled through corruption, such as reduction of competition and manipulation of project bidding procedures. Section 7.3 then presents the case studies and summarises the corrupt schemes. Diagrams are provided for the more complex corrupt networks. The case studies show how internal company procedures aimed at preventing corruption were ignored, and multiple consultants were used as intermediaries to bribe government officials to obtain projects. The case studies focus on corruption at the bidding stage of infrastructure projects. Section 7.4 uses the general application of the Institutional Analysis and Development framework in Chapter 4 to analyse the case studies. Section 7.5 concludes.

7.2 Infrastructure sector corruption.

Chapter 1 summarises the potential negative outcomes of corruption in the infrastructure sector for the economy and the risks it can create for the

population. It also outlines the reasons for the particular vulnerability of the sector to corruption. This section focuses on the types of objectives that can be fulfilled through corruption in this sector.

Although it has been noted that financial rewards from individual acts of corruption are highest at early phases of project cycles (Hawkins, 2013), any phase of an infrastructure project can be affected by corruption. Additionally, corruption at earlier phases may lead to corrupt agreements later on in the project cycle (Wells, 2015). For example, a consultant may be offered a bribe in exchange for manipulating the costs and benefits estimations in such a way that the project passes the initial feasibility appraisal. Another bribe may be given to consultants producing the detailed design and preparing the costs for budgeting, to ensure that the figures produced at earlier evaluations are not vastly different from the later-phase estimates.

As discussed in Section 2.3.3, corruption can be perceived as a method of problem-solving (see also Marquette and Peiffer (2015)). If corruption is thought to be a method of solving problems created by, for example, government-imposed rigidities, it is necessary to understand the objectives fulfilled by corruption and to identify methods of shifting incentives away from corrupt activities towards alternative, legal ways of achieving these objectives. Although the motivations for engaging in corruption are varied, and may be difficult to pinpoint, this section outlines some of the key objectives fulfilled through corrupt means, with the focus on infrastructure projects. The examples used in this section to explain how corruption occurs in infrastructure projects are from GIACC (2008).

For companies in the infrastructure sector, the key objectives fulfilled through corrupt agreements can be separated into four categories:

1. Passing pre-qualification criteria and being selected for participation in bidding or tender processes

2. Reducing competition and increasing the likelihood of obtaining projects or contracts

3. Increasing economic rents or profits from contracts

4. Obtaining permits, certifications to operate, or gaining certification of completed work (especially where completed work is defective)

If a company has an adverse track record or characteristics disqualifying the company from competing for projects, it may attempt to pay off the relevant official to overlook these and allow the company to participate in bidding. In cases where tender is carried out by an invitation to bid, kickbacks can be used to ensure that the company is included in the list of bidders.

There are several methods for companies to reduce their competition when competing for projects. Bribes can be offered to officials responsible for selecting companies for the invitation to bid for a project or during the pre-qualification phase. Rival companies can be excluded for superficial reasons. Where the design of the infrastructure is carried out prior to bidding, a consultant architect can be bribed to include in the design a feature providing one company with an advantage over others. For example, a company may use specific technology, and this may be incorporated into the project design or specifications.

Corruption and collusion often go hand in hand (Lambert-Mogiliansky and Sonin, 2006). As such, several companies in the construction industry can collectively lobby the government to develop regulation that creates barriers to entry of foreign construction companies. Such regulation can purportedly be aimed at addressing health and safety issues, and it is difficult to ascertain whether the motive behind the new regulation is improving the welfare of the population, or creating an unfair advantage to the domestic industry. The result

is exclusion of foreign competitors in the medium-term, until foreign firms adapt their technology and methods to meet the new regulation standards.

Another example of collusion between construction companies is participation in bidding processes to create an illusion of a competitive environment, but in fact agreeing beforehand on which company will be chosen. That is, companies may agree before the bidding starts on which company will be allocated each part of the project. In such cases, the officials managing the tender have a list of red flags to identify collusion. Bribes may be used in exchange for officials overlooking collusive practices.

It has been observed that a low level of corruption is correlated with high competition, which led to the conclusion that increased competition can decrease corruption (Emerson, 2006, Ades and Di Tella, 1999). The intuition behind this argument is that competition reduces excess profits from which bribes can be paid (Bliss and Di Tella, 1997) (see Section 2.3.2). However, it has been argued that competitive pressures increased corruption in the EU (Warner, 2007). The basic incentive for companies to corrupt is profit-seeking (discussed in Section 2.4.2). One of the mechanisms to achieve higher margins is by reducing competition to drive up the prices. Faced with new market entrants, firms are expected to invest in efficiency-enhancing systems to remain competitive. This requires time, effort and the availability of finance. The 2007-2008 global financial crisis already reduced company margins, and corruption may be perceived as a cheaper and more attractive short-term method of obtaining new projects.

In order to increase profits from projects, companies can attempt to influence the size and value of the project, or reduce their costs through the use of lower quality materials, or overstating the associated time and costs. It is in the interests of the construction industry that large complex projects are chosen, for which costs are difficult to estimate with accuracy. Corruption can be used as a method of motivating the officials responsible for initiation and selection of

projects to ensure large high-cost project pass the initial screening process. Where consultants are used to estimate the costs and benefits of proposed projects, they may be bribed to understate the costs and overstate the benefits. Consultants may already be in the position that incentivises them to produce evaluations of project costs and benefits that overstate the project's viability. This can ensure commissions of further work for the consultant on the same or on other projects.

During construction, companies may skimp on materials, use lower-quality equipment, or over-report their expenditure. These actions, by themselves, constitute fraud rather than corruption. However, supervising engineers certifying the quality of work may be offered kickbacks to overlook such instances of fraud.

The objectives identified above are linked, and a corrupt agreement can be aimed at fulfilling several objectives. Thus far, the objectives of actors on the demand side of corruption outlined are the objectives of a company bidding for infrastructure projects. In Chapters 4, 5 and 6, the term Candidate is used to discuss this position of a company that stands to benefit from a successful corrupt agreement. The objectives of individuals participating in corruption on behalf of the companies in infrastructure projects are rarely considered. The term Representative is used in the preceding chapters to discuss the position and the role of these individuals. The Derived Benefit gained by Representatives can be financial such as pay raise or a bonus following a successful contract acquisition; or status gains, such as promotion.

For the actors on the supply side of corruption, the often-discussed objective behind the corrupt agreements is self-enrichment. However, institutional corruption, where individual officials do not receive bribes directly, but trade favours in exchange for donations to political parties is an important factor. In the context of the EU, it has been shown that the infrastructure sector is particularly lucrative in terms of financing political donations. Both central and

local political parties require financing, and decentralisation is thought to increase the prevalence of corruption at the local level (Warner, 2007).

In addition to the individuals occupying positions of Candidates, Representatives and Decision Makers (or officials), corrupt agreements in infrastructure projects can involve consultants that fulfil the roles of project design and evaluation. As mentioned above, the motivations of these consultants to engage in corruption may not be limited to self-enrichment. Future consultancy contracts can be conditional on fulfilling the wishes of the client, and this can create incentives to adjust or even falsify data to ensure the lucrative projects are selected and implemented.

Hence, there is a myriad of objectives that can be fulfilled through corruption, and a number of potential interested parties. The roles of different individuals and the types of gains obtained through corrupt agreements are not always well-understood. The case studies below, therefore, focus on the different positions occupied by individuals involved in corruption, their roles in the corrupt agreements and the types of benefits obtained through corrupt means.

7.3   Case studies

7.3.1   Data sources

The case studies presented in this chapter are developed using criminal court case materials that were used in support of prosecutions under the United States' Foreign Corrupt Practices Act (1977)[3] (FCPA). The FCPA prohibits the practice of making payments to government officials in countries outside the US for the purpose of obtaining or retaining business[4]. The FCPA has an

---

[3] Anti-Bribery and Books & Records Provisions of The Foreign Corrupt Practices Act
https://www.justice.gov/sites/default/files/criminal-fraud/legacy/2012/11/14/fcpa-english.pdf

[4] Foreign Corrupt Practices Act. An Overview
https://www.justice.gov/criminal-fraud/foreign-corrupt-practices-act

extraterritorial reach, and enforcement actions are usually taken on the basis that US currency or other US resources were used, or if US companies or persons were involved (Henschel, 2016). Enforcement actions in such cases can be taken not only against the company, but also its directors, officers or agents.

The FCPA prosecution documents were chosen as the source of case studies because they provide detailed accounts of the corrupt cases. The documents provide information including the corporate structures of companies involved, their officers and agents implicated in corruption; information on the business transactions subject to corruption, their value and the manner in which corruption affected these business transactions; details of the foreign government officials' actions; the sizes of bribes offered or given, and the manner in which the bribes were delivered to the government officials. The documents are also freely available from the US' Department of Justice website[5] and there are over 500 enforcement actions brought by the US Securities and Exchange Commission and the US Department of Justice (Stanford Law School, 2018).

A number of large companies in transportation, infrastructure and construction industries have been prosecuted under FCPA. The largest monetary sanctions to date (May 2018) were imposed on Alstom S.A. ($772m), Siemens Aktiengesellschaft ($448.5m) and Kellogg Brown and Root LLC ($402m) (Stanford Law School, 2018).

A comparable UK law to US' FCPA with extra-territorial reach is the UK's Bribery Act 2010[6]. Some information on the UK prosecution cases of bribery

---

[5] Foreign Corrupt Practices Act. Related Enforcement Actions
https://www.justice.gov/criminal-fraud/related-enforcement-actions

[6] Bribery Act 2010 c.23
http://www.legislation.gov.uk/ukpga/2010/23/contents

offenses is available in the Law Pages[7], but the summaries provided are not as detailed as the US FCPA prosecution resources and do not provide the same level of insight into the corrupt networks and schemes. Therefore, US FCPA prosecution documentation was chosen over other resources.

The key benefit of using past FCPA court cases for case studies is that they provide details of real-world corrupt agreements and this allows an empirical analysis of corruption. Laboratory-based experiments can provide insights into how individuals make decisions under controlled conditions, but external validity of such experiments and the extent to which they accurately capture the nature of corruption are uncertain. The FCPA court cases also reveal corrupt acts across the world, with prosecutions based on corrupt actions that have taken place in different countries such as Egypt, Indonesia, China and Argentina.

The documents set out the facts, sighting evidence such as the content of emails exchanged between corrupt partners, and transfers of funds to pay the officials. The drawback of this source of information is that it is often incomplete or fragmented. For example, only the bribes that were discovered through investigations form part of the evidence used for prosecutions. There could be more payments that have been made that remained hidden. Some facts may also have been omitted from the documents, with the intention to bring additional charges against the company or its officers or agents in the future. Even in light of these limitations, the information provided in FCPA documentation allows the creation of case studies showing how corrupt networks were formed.

---

[7] http://www.thelawpages.com/

7.3.2   Choices of court cases for case studies

The case studies were developed based on the information contained in FCPA prosecution case documentation. The prosecution cases were selected from the list of the most recent cases available at the time the selection was made (beginning of 2015). Two years of cases were selected – these were the cases prosecuted in 2014 and 2013. Appendix D shows the list of cases. The cases are numbered, with the most recent one assigned number 1 (US v. Alstom S.A., et al) and the oldest considered case of 2013 (US v. Neal Uhl) assigned number 44.

Out of the 44 prosecution cases, only the cases containing corrupt schemes in infrastructure procurement processes were selected. Selecting cases that are based on corruption in similar industries and settings allows a more direct comparison of key features. The eight cases that were selected describe corrupt schemes related to bidding, design, engineering or construction of power grids or natural gas pipelines.

Several prosecution cases are based on multiple corrupt schemes. For example, the prosecution case against Alstom (case 1) describes corrupt payments made in Indonesia, Saudi Arabia, Egypt, the Bahamas and Taiwan. Some of the cases are linked and, therefore, are considered jointly. So, for example, Hoskins (defendant in case 29), Pomponi (case 35), Pierrucci (case 37) and Rothschild (case 38) were employees of Alstom (case 1), and the information detailed in these cases is incorporated into the summaries of the Alstom cases in Section 7.3.3.

The FCPA cases selected for case studies are as follows.

(1) Alstom (US v. Alstom S.A., et al)

This case documentation sets out multiple corruption cases related to the design, construction and provision of services related to power generation facilities, power grids and rail transportation in Indonesia, Saudi Arabia, Taiwan, Egypt and the Bahamas. Related cases are:

(16) US v. Marubeni Corporation (2014) – consortium partner of Alstom in one of the projects (case study 1, Indonesia, Tarahan project).

 (29) US v. Lawrence Hoskins (2013) - Senior Vice President of Alstom's International Network, who oversaw efforts to obtain contracts with new customers.

(35) US v. William Pomponi (2013) - Vice President of Regional Sales at Alstom Power US, who was responsible for obtaining boiler contracts.

(37) US v. Frederic Pierrucci (2013) - Vice President of Alstom's boiler line, who was assigned to Alstom Power US, overseeing efforts to obtain boiler contracts.

(38) US v. David Rothschild (2013) - Vice President of Regional Sales at Alstom Power, who was responsible for obtaining boiler contracts.

(17) US v. Asem M. Elgawhary (2014)

Asem Elgawhary was an executive at Bechtel Corporation who provided confidential information and manipulated power projects awards in exchange for bribes in Egypt. Elgawhary was also one of the decision-makers in Alstom bribery schemes in Egypt. However, US v. Asem M. Elgawhary sets out corrupt schemes involving other companies and these are considered as a separate case study.

(24) US v. Bilfinger SE

This was a corrupt scheme to pay bribes to Nigerian officials to obtain a project to build a natural gas pipeline.

The case studies below use the same references to individuals as contained in the FCPA case documentation. For example, consultants used in corrupt agreements are not normally named, but are referred to as Consultants A, B, C, etc.

The FCPA cases that were not selected for case studies are as follows:

- Cosmetics sales (Avon, cases 2 and 3)

- Aircraft maintenance contracts (Dallas Airmotive, Bizjet and several individuals, cases 4, 41, 42, 43 and 44)

- Sales of medical equipment (Bio-Rad Laboratories, case 5)

- Broker-dealer services (several individuals, cases 6, 7, 30, 32, 33 and 34)

- Computer Sales (Hewlett-Packard, cases 8, 9 and 10)

- Mining permissions/ rights (several individuals, cases 11, 12, 13, 14, 15 and 40)

- Supply of raw materials (Alcoa World Alumina, case 18)

- Oil services (several individuals, cases 19, 20 and 21)

- VAT fraud (Archer Daniels Midland Company, Alfred C. Toepfer International, cases 22 and 23)

- Oil equipment supplies (Weatherford International, cases 25 and 26)

- ATM equipment contracts (Diebold, case 27)

- Sales of high-voltage/ high-tension capacitors (Alain Riedo, case 28)

- Oil and gas concessions (Total, case 31)

- Customs clearance of merchandise (Ralph Lauren Corporation, case 36)

- Compliance with customs and tax laws (Parker Drilling Company, case 39)

Nine case studies were developed from the documentation supporting the selected eight prosecution cases:

Case study 1: Alstom, Indonesia – Tarahan project

Case study 2: Alstom, Indonesia – Muara Tawar project

Case study 3: Alstom, Saudi Arabia – Shoaiba projects

Case study 4: Alstom, Bahamas

Case study 5: Alstom, Taiwan – Taipei metro-rail system

Case study 6: Alstom, Egypt – transmission and distribution projects

Case study 7: Alstom, Egypt – Nubaria and El Tebbin projects

Case study 8: Bechtel, Egypt

Case study 9: Bilfinger, Nigeria

7.3.3 Summaries of case studies

Alstom schemes overview

As the majority of case studies (1 to 7) are developed from Alstom S.A. prosecution documents, a company overview and a summary of its corruption schemes are provided separately to the case studies.

Alstom S.A. is a company headquartered in France. Its business is design, construction and provision of services related to power generation facilities, power grids, and rail transportation systems around the world. Its annual sales

at the time of the events considered were €17bn, and it employed 75,000 people in over 70 countries.

Alstom S.A. operated through a number of subsidiaries, and a number of senior executives, including Hoskins, Pomponi, Pierrucci and Rothschild (who were also prosecuted separately, see Section 7.3.2) were in charge of obtaining contracts across the world, and overseeing compliance with international anti-corruption standards in consultancy agreements. Henceforth, using the term in this thesis, these executives will be referred to as Representatives of the company. They designed corrupt schemes to obtain business for Alstom S.A. and authorised payments aimed to bribe foreign officials. For clarity of the description of the corrupt scheme, Alstom S.A. and its subsidiaries is represented as one organisation throughout this chapter.

The Representatives of Alstom hired consultants to conceal and disguise payments to foreign officials as consultancy fees or commissions. The consultants passed a proportion of the funds they received to foreign officials as bribes.

Alstom had accounting controls and internal policies in place aimed at preventing unlawful payments to foreign officials. However, these controls and policies were not adequately implemented and company Representatives did not comply with them. In accordance with Alstom's internal policies, a number of red flags were raised when consultants were retained, but these were ignored. For example:

1. Consultants had no expertise or experience in the industry sector in which Alstom looked to secure projects

2. Consultants were located in countries other than the project country

3. Consultants were paid in currencies and to bank accounts based in countries different to the country the consultant was located in

4. More than one consultant was hired for the same project, and to provide the same services

5. Payments to consultants were made without the documentation showing the service provided to Alstom

There was a lack of adequate controls for the approval of consultancy agreements. Additionally, Alstom policies were violated to pay consultants higher amounts and sooner than originally agreed. As per Alstom internal policies, consultancy agreements included provisions that prohibited unlawful payments, but this had no effect on the corrupt nature of the payments.

Alstom Representatives maintained an unwritten policy to avoid making consultancy agreements that would bring Alstom's practices under the jurisdiction of the US. There was a tendency to use consultants based outside the US, and payments were made in currencies other than US$ and into accounts based outside the US. This suggests that Alstom and its Representatives were aware that the corrupt schemes were in direct violation of the FCPA and looked to reduce their liability.

Some of Alstom's subsidiaries had headquarters in the US, which brought them under the scope of the FCPA. Alstom also issued shares of company stock on the New York Stock Exchange until 2004, which also meant that Alstom came under US jurisdiction for the purposes of the FCPA.

Alstom carried out several corrupt schemes in Indonesia, Egypt, Saudi Arabia, Taiwan and the Bahamas. The company paid approx. $75 million in consultancy fees that were in part paid in bribes to foreign officials to secure $4bn in projects, with a gain to Alstom of approximately $296m.

Case study 1: Alstom, Indonesia – Tarahan project

In 2002-2009 Alstom secured several power projects in Indonesia. One of such projects was the Tarahan project to provide power-related services to the citizens of Indonesia at approximately $118m. Perusahaan Listrik Negara (PLN), a state-owned and state-controlled electricity company in Indonesia, was responsible for sourcing the Tarahan Project.

Marubeni Corporation was Alstom's consortium partner in this project. Marubeni is headquartered in Japan and provides power generation services. At the time of the events considered, the company, its subsidiaries and joint ventures had trading transactions of approximately $74bn per year, with 24,000 employees located in over 70 countries.

In order to ensure that Alstom and Marubeni's joint project bid won the Tarahan project, the two companies retained consultants to bribe the Indonesian officials. These officials are not named in the documentation, but are referred to as Officials 1, 2, 3 and 4. Official 1 was a member of the Indonesian Parliament with a parliamentary portfolio including the responsibility for power and energy. He had a well-established relationship with Official 2, who was the President Director of PLN. Official 1 was, therefore, in the position to exert influence on Official 2 and on the PLN's board. Official 2 was in the position to influence PLN's contract awards. Official 3 was a high-ranking member of the PLN evaluation committee for the Tarahan project with broad decision-making authority over the award of contracts. Official 4 was an engineer working on the Tarahan project.

Although it is not clearly set out in the case documentation, email communications between Alstom Representatives included as evidence in US v. Marubeni Corporation[8] suggest that Official 1 initially proposed to use his

---

[8] United States v. Marubeni Corporation. Court docket number 14-CR-00052-JBA

"representative company" for transferring bribes. This company may have been controlled by Official 1, in which case the transfers of bribes would have been direct from Alstom and Marubeni to Official 1. Representatives of Marubeni and Alstom were concerned about using this route, and decided to use Consultant A as an Intermediary. The name of this consultant is not provided, and the individual and his company are referred to jointly as Consultant A.

Consultant A's agent profile showed that it is a company in Baltimore, Maryland, US. As outlined in the summary above, Alstom's unwritten policies were to avoid using US-based companies and bank accounts. Alstom Representatives exchanged emails expressing a preference to use an Indonesia-based company, but an exception was made in this case.

Alstom and Marubeni initially retained Consultant A for the purpose of providing bribes to Official 1 and the PLN officials (Officials 2, 3 and 4). Consultant A was to receive 3% of the contract value (3% of $118m). Official 1 was content with using Consultant A as a conduit, but PLN officials were not. They did not trust Consultant A to transfer the promised amounts once they supported the Alstom and Marubeni's bid, and thought that Consultant A would give them "pocket money" and disappear.

This lack of officials' trust in Consultant A was explained from different perspectives in the documentation supporting the cases against Marubeni, Alstom and its employees. First, Alstom and Marubeni considered that they required only marginal support of the officials to win the project. This suggests that Consultant A's negotiations with the PLN officials reflected the assessments made by Alstom and Marubeni's Representatives. In one of the emails, Consultant A told Pomponi that the PLN evaluation committee were unhappy about the amount of money they were receiving, further suggesting

---

https://www.justice.gov/criminal-fraud/case/united-states-v-marubeni-corporation-court-docket-number-14-cr-00052-jba

that Alstom and Marubeni dictated the sizes of bribes that were offered to the officials, rather than leaving this decision to Consultant A.

Second, PLN officials thought that Consultant A was not willing to spend money. This could refer to the meeting between Consultant A and Officials 1 and 2 in Europe. Consultant A looked to Alstom to finance the officials' visit, which presumably meant offering entertainment and gifts for the officials. Again, although it is not clearly set out in the documentation, it could be inferred from the emails that Alstom and Marubeni expected Consultant A to finance the visit and be reimbursed after the project was secured, but Consultant A was not prepared to do so.

Whatever the reason for the PLN officials' lack of trust in Consultant A, Alstom and Marubeni decided to limit this consultant's role to providing bribes to Official 1 only, and retained another consultant, Consultant B, to bribe PLN officials. Consultant A's agreement was amended to reduce the payments from 3% to 1% of the project value. An agreement was made by Marubeni with Consultant B for 2% of the project value. Consultant B was then expected to provide bribes to Officials 2, 3 and 4.

The case documentation shows some of the payments made by Alstom into Consultant A's company's account totalling $666,880, and the payments made by Marubeni totalling $357,794. The payments from Alstom to Consultant B detailed in the documentation totalled $1,267,072. Marubeni's payments to Consultant B were not included in the case documentation. From over $1m paid to Consultant A, US v. Pierrucci and US v. Pomponi documentation shows that Official 1 received $360,000.

Figure 16 shows the key organisations, actors and the corrupt transfers related to the Tarahan project. There were a number of Representatives in Alstom including Pomponi, Hoskins, Pierrucci and Rothschild. They fulfilled various roles in corrupt agreements, including retaining Consultants A and B, approving

their consultancy agreements and approving payments to these consultants. Their combined actions led to payments being made to the consultants and then to Indonesian government officials. In return, Alstom obtained the Tarahan project worth $118m.
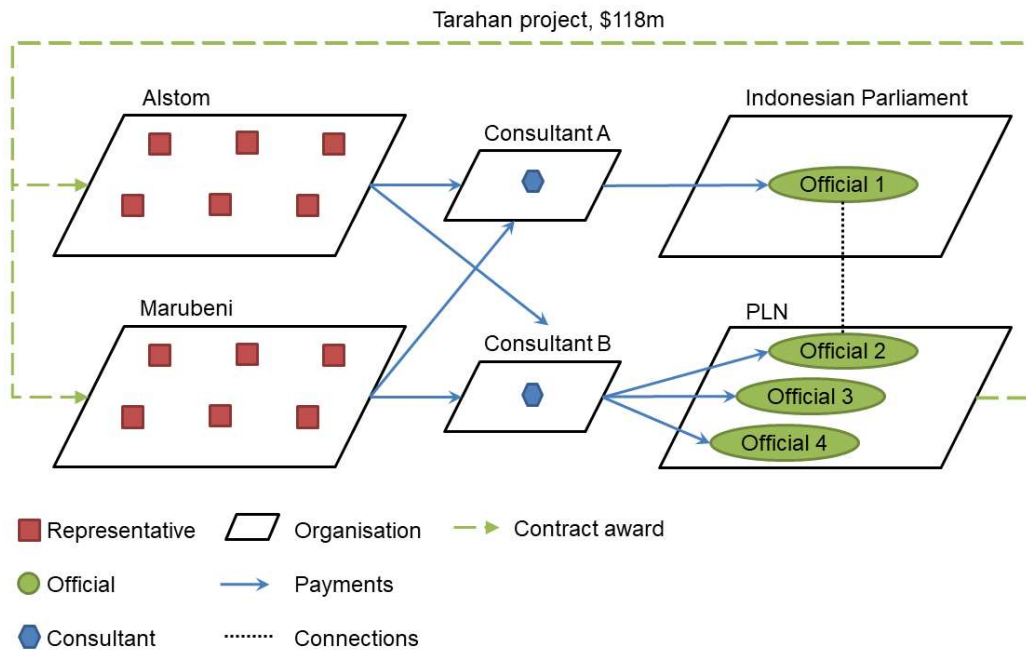
Figure 16 Corrupt agreements, case study 1: Alstom, Indonesia - Tarahan

Case study 2: Alstom, Indonesia – Muara Tawar project

Another project Alstom looked to secure with PLN was Muara Tawar Block 5 Project to expand the existing Muara Tawar power plant and provide additional power-related services to the citizens of Indonesia, at approximately $260m.

The same two consultants which were used in connection with the Tarahan project were retained to bribe the relevant officials – again, Officials 1, 2, 3 and 4 – in connection with the Muara Tawar project. Based on Tarahan project, PLN officials refused to deal with Consultant A, so the bribes were mostly

negotiated by Consultant B. Where Consultant A was used, he was mostly fulfilling the functions of a cashier.

Since Tarahan project, Alstom used its influence to promote Official 4 (an engineer in Tarahan project) so that he became a member of the procurement team in Muara Tawar project. Official 4 believed he was not fully compensated for his support of Alstom and Marubeni's bid in Tarahan project, and threatened to negatively affect the outcome of Muara Tawar Block 5 bidding outcome.

Nonetheless, Alstom was awarded the Muara Tawar Block 5 project, although the transfers to the officials and the bribe payments were not detailed in FCPA case documentation.

Case 3: Alstom, Saudi Arabia – Shoaiba projects

In late 1990s – early 2000s, Alstom bid for power projects in Saudi Arabia with the Saudi Electric Company (SEC), Saudi Arabia's state-owned and state-controlled electricity company. The projects were located at a site known as Shoaiba. These were a series of projects for construction of 14 steam power generating units. The first two stages of the Shoaiba Projects involved the construction of an oil-fired power plant with 11 power generating units, at the value of $3bn.

Alstom retained at least six consultants in connection with the first two Shoaiba Projects, to bribe Saudi officials with the responsibility for the bidding stages of the projects. The consultants were referred to by their code names – 'Mr Geneva' (Consultant C), 'Mr Paris' (Consultant D), 'London' (Consultant E), 'Old Friend' (Consultant F) and 'Quiet Man'.

'Mr. Geneva' (Consultant C) was a brother of a high-level official at the SEC who had the ability to influence the award of the Shoaiba Projects (Official 5). Mr Geneva was paid approximately $5m.

Consultant D, 'Mr Paris', was a close relative of another high-level official at the SEC with the ability to influence the award of the project (Official 6). Mr Paris was paid at least $4m. Alstom believed that Official 6 had 70% of the decision-making power over the award of contracts by the SEC. In addition to the transfers made to Consultant D, $2.2 million was paid to a US-based Islamic education foundation associated with Official 6.

Consultant E, 'London' received at least $30m in connection with the first two Shoaiba Projects. Consultants F ('Old Friend') was paid at least £10m. The case documentation does not provide information on what proportion of these transfers to consultants was then transferred to Saudi officials. However, the documents include emails exchanged between Alstom representatives about the cost of doing business in Saudi Arabia. One of the emails stated that it was a requirement under Saudi royal decrees that at least 10% of employees of companies working on construction projects like Shoaiba must be Saudi. Such employees are then recommended by the client (government officials), and these are likely to be friends and family of the officials. The costs of such employees was estimated to be as high as $100,000/year, and "zero productivity may be assumed".

After Alstom acquired the contracts, it required a certificate from the SEC to get paid for its work on Stage 1, Phase 2 of the Shoaiba Project. An Alstom Representative sent an email to his colleague saying that he is prepared to "show support" (provide bribes to the relevant officials) of €20,000 (payable half in Saudi Riyals and half in Euro).

Figure 17 shows the corrupt scheme in relation to the Shoaiba project.
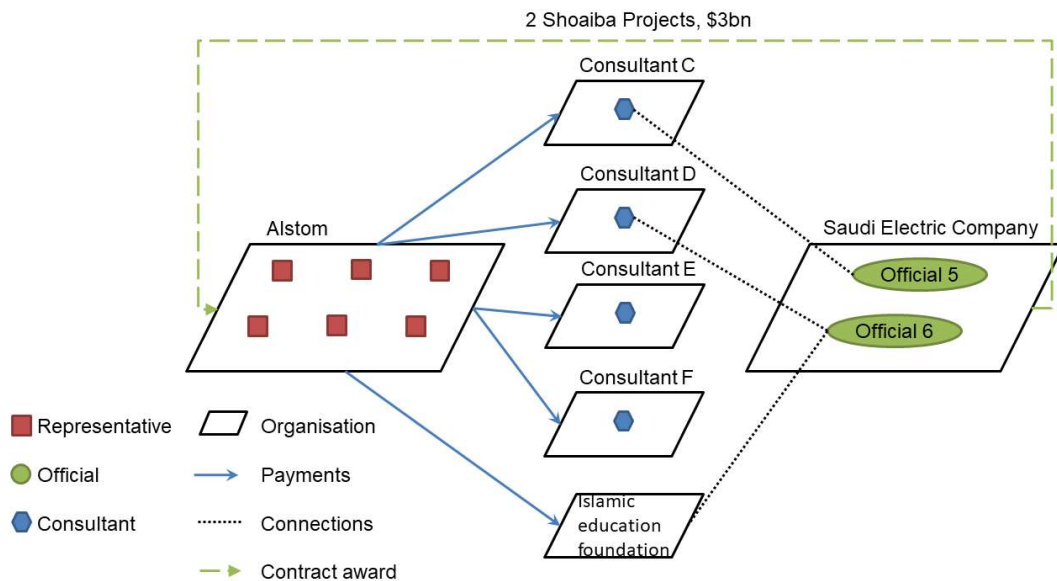
Figure 17 Figure 16 Corrupt agreements, case study 1: Alstom, Saudi Arabia - Shoaiba

Case study 4: Alstom, Bahamas

In 1999-2004 Alstom bid on a number of projects with the Bahamas Electricity Corporation (BEC). Consultant I was retained to pay bribes to the Bahamian government officials in connection with bidding for projects. Consultant I was a US citizen and a close friend of Official 8, who was a board member of BEC.

Consultant I had no experience in the power industry, and his business was in the sales of furniture and leather products, export of chemical products and spare parts. Retaining of this consultant raised a number of red flags in accordance with Alstom's compliance policies, which were ignored.

The consultancy agreement sent to Consultant I included a clause that if he made corrupt payments to government officials, the agreement would be void. Consultant I initially refused to sign the agreement with these stipulations, and

asked for the agreement to be amended. Alstom employees could not amend the agreement to remove the provisions regarding unlawful payments.

Consultant I was also required to open a bank account outside the US, in accordance with Alstom's unwritten rule to avoid using US accounts to transfer bribes. Alstom made six payments into Consultant I's account, totalling approximately $650,000. Consultant I then made six payments to Official 8, totalling roughly half of the amount he received.

Case study 5: Alstom, Taiwan: Taipei's metro-rail system

In 2001-2008 Alstom bid for transport-related projects with a number of Taiwanese organisations responsible for the construction and operation of the metro-rail system in Taipei, including Taipei's Department of Rapid Transit System (DORTS). DORTS' command and control room (CCR) project had the value of $15m.

Alstom entered into a consulting agreement with a Taiwanese company (Consultant J) in relation to the CCR project. The consultant did not have expertise in the transport sector, and his business was wholesale of cigarettes, wines and pianos. This raised red flags with the Alstom compliance personnel who inquired about the functions of Consultant J. Despite this, the consultant was retained.

Consultant J was paid approximately $380,000 in total in connection with the CCR project. Another consultant was retained for the same project, but the transfers to this consultant are not included in the case documentation.

Case study 6: Alstom, Egypt – transmission and distribution projects

In 2002-2010, Alstom bid on a number of projects with the Egyptian Electricity Holding Company (EEHC), a state-owned and state-controlled electricity

company in Egypt, and the Egyptian Electricity Transmission Company (EETC), a state-owned and state-controlled electricity transmission company in Egypt, to build electric grids. This included the Reactive Power Compensation (RPC) project, valued at $15m, and the Three Substations project, at $30m.

The two projects were part-funded by the US Agency for International Development (USAID). One of the conditions of USAID projects was for Alstom to disclose whether they used consultants, and whether any commissions were paid in connection with the projects. Alstom submitted false certifications, omitting that they used consultants who were paid commissions.

Alstom retained three consultants including Consultant H to pay bribes to the Egyptian officials with the ability to influence the award of the contracts. Consultant H's commission was set at 1.5% of the value of the RPC project contract. Alstom also paid and provided gifts, travel and entertainment directly to Egyptian officials, including Official 7.

A finance employee of Alstom at first refused to release the payments to Consultant H due to insufficient proof of services. The project manager warned her that discussing Consultant H can cause several people to be put in jail, and instructed her to delete emails regarding this consultant.

Case study 7: Alstom, Egypt – Nubaria and El Tebbin projects

In addition to the above transmission and distribution projects, in 2002-2011 Alstom bid for several power stations projects with the Egyptian Electricity Holding Company (EEHC). EEHC had a number of projects to build power stations in Egypt, including the Nubaria power station project, with the value of $70m and the El Tebbin power station project, at $60m. EEHC outsourced the bidding stage of the projects to Power Generation Engineering & Service Co. (PGESCo).

Alstom retained Consultant G to bribe Egyptian officials, including Asem Elgawhary who oversaw the bidding process. Asem Elgawhary was also charged under the FCPA (see Section 7.3.2).

Alstom was awarded the projects, including Nubaria and El Tebbin. Alstom transferred funds to Consultant G – approximately €5m ($6.22m)[9] in connection with these projects. Consultant G then transferred $3m to Elgawhary and another EEHC official.

Case study 8: Bechtel, Egypt

Bechtel is a company headquartered in San Francisco, California, US, and its business is engineering, construction and project management. EEHC (Egyptian Electricity Holding Company, see above) subcontracted with private companies and outsourced the project bidding processes to PGESCo (Power Generation Engineering and Services Company) a joint venture between Bechtel, EEHC and an international bank. PGESCo's business was engineering, design and construction of power projects. It assisted EEHC in identifying subcontractors, carrying out the bidding processes and awarding contracts.

In 1973-2011, Asem Elgawhary held a number of executive-level positions in Bechtel, and was a General Manager at PGESCo in 1996-2011. Elgawhary had access to confidential information that, if disclosed to one of the bidding companies, could provide an unfair advantage. He also had influence on the decision-makers at EEHC with the responsibility for selecting companies for projects.

---

[9] Using 1.244 dollar-euro conversion rate in 2004, the year payments were made (https://www.ofx.com/en-gb/forex-news/historical-exchange-rates/yearly-average-rates/)

Several companies paid kickbacks to Elgawhary in return for a preferential treatment in the bidding and the award of contracts. Such preferential treatment included provision of confidential information about the competing companies and about the bidding process. For example, Elgawhary provided performance comparison to a consultant of a Japanese company relating to other power companies competing for the project. Elgawhary also influenced the timing of the bidding process, granting extensions to the Japanese company for two projects.

Case study 9: Bilfinger, Nigeria

Bilfinger SE is an international engineering and services company headquartered in Germany, which provides industrial services, power services, building and facility services and construction. Companies partly owned by Bilfinger provided engineering, construction and other services in the oil and gas industry. Bilfinger and its subsidiaries are referred to as one organisation in this section.

The Eastern Gas Gathering System (EGGS) was a natural gas pipeline system in the Niger Delta designed to relieve the existing pipeline capacity constraints. The EGGS project was to construct a major natural gas pipeline system through a difficult terrain in the Niger Delta, and was divided into two phases. The first was to engineer, procure and construct the pipeline from the Soku Gas Plant to the Bonny Island Liquefied Natural Gas Plant. Phase 1 contained an optional scope of work to apply a Polyethylene-concrete coating to the pipeline to give it weight and protection (EGGS Coating). Phase 2 was also an optional scope of work to construct a second pipeline from the Gbaran/Ubie node to the Soku Gas Plant. The base scope's value was $216.5m, the optional EGGS Coating scope's price was $30m and the optional Phase 2 was valued at $141m. The combined value of the EGGS project was $387.5m.

Nigerian National Petroleum Corporation (NNPC) was a government-owned company in charge of developing Nigeria's oil and gas, and regulating the oil and gas industry. National Petroleum Investment Management Services (NAPIMS) was a subsidiary of NNPC that oversaw Nigeria's investments in development projects. NNPC and a number of multinational oil companies, including Shell Petroleum Development Co of Nigeria Ltd (SPDC) entered into a Joint Venture to deliver the EGGS project.

Bilfinger entered into a consortium agreement with Willbros International Inc. and its subsidiaries to jointly bid on the EGGS project. Willbros is a US company that provided construction, engineering and other services in the oil and gas industry. Bilfinger and Willbros promised over $6m in bribes to Nigerian officials, including an official in the executive branch of the Nigerian Government, officials of NNPC, NAPIMS and the dominant Nigerian Political Party, in order to obtain the EGGS project. The Bilfinger-Willbros consortium bid on and obtained the EGGS project, including the optional scopes of work.

Bilfinger and Willbros inflated the price of their project bid by 3% to cover the cost of bribes to the Nigerian officials. Bilfinger employees referred to such bribe payments as 'landscaping' and Willbros employees called them 'commitments'. Bilfinger and Willbros submitted invoices to SPDC for payment, which were for inflated amounts that included the cost of bribe payments to Nigerian officials. Bilfinger employees were responsible for bribing officials from NNPC and NAPIMS, and Willbros provided bribes to officials from SPDC. Billfinger employees made payments in cash, which was mailed or flown to Nigeria from Germany.

One of the NNPC officials was promised $150,000 in return for his help for the Bilfinger-Willbros consortium to secure the contract, which a Bilfinger employee delivered in cash. Several other NNPC and NAPIMS officials (between seven and nine individuals) were promised a total of $1m in return for helping the

consortium obtain the contract. One of these officials received $50,000 and another received between $30,000 and $50,000.

7.3.4   Case studies discussion

The case studies describe corrupt agreements made between the late 1990s and 2010 in connection with transport, power and gas projects in Indonesia, Saudi Arabia, Egypt, the Bahamas, Taiwan and Nigeria. The projects varied in size and value. Table 5 summarises the key information in case studies: values of the projects, numbers of known consultants used as Intermediaries for corrupt payments, the amounts received by Intermediaries, and the amounts promised or paid to the officials.

The information in the table is incomplete because the values of projects are not always specified in the documentation (project values are not known for the projects in the Bahamas, case study 4, and in Egypt, case study 8), and only some of the payments made to the consultants and the officials are listed. For example, Alstom paid at least 2.5% of the value of the CCR project to consultants (case study 5). There were at least two consultants, and the payments to one of them are not specified. In one case (Tarahan project, case study 1), however, the proportion of the project value transferred to the consultants is known from the emails between the company Representatives and the Intermediaries – 3%. Therefore, the values of corrupt payments in most cases can be treated as the minimum estimate. The exception is case study 7: €5m ($6.22m) transferred to Consultant G financed bribe payments in connection with several projects, including (but not limited to) Nubaria ($70m) and El Tebbin ($60m). Therefore, 4.8% is a high estimate of a proportion of the project value that was paid to consultants to obtain these projects. Around half of these transfers ($3m) are known to have been transferred to the Egyptian officials.

189

Table 5 Case studies summaries

Project (case study number)	Project value	Number of Intermediaries used	Amounts transferred to Intermediaries / proportion of project value	Amounts promised/ sent to officials
Command and Control Room, part of the Taipei metro-rail project (case study 5)	$15m	2	At least $380,000 (2.5%)	Not known
Reactive Power Compensation (RPC) and Three Substations projects (case study 6)	$15m and $30m	3	At least 1.5% of the RPC project	Not known
El Tebbin and Nubaria projects (case study 7)	$60m and $70m	At least 1	Up to $6.22m (4.8%)	$3m (2.3%)
Tarahan project (case study 1)	$118m	2	3%	Not known
Muara Tawar project (case study 2)	$260m	2	Not known	Not known
Eastern Gas Gathering System project (case study 9)	$387.5m	None known - direct payments to officials	N/A	$6m (1.5% of project)

Shoaiba projects (case study 3)	$3bn	At least 6	At least $51.2m (1.7%)	Not known
Power projects in the Bahamas (case study 4)	Not known	1	$650,000	Around half of $650,000
Projects in Egypt (case study 8)	Not known	Not known	Not known	Not known

Table 5 shows that consultants were paid 1.5%-4.8% of the project value. At least half of these payments were transferred to officials (based on case studies 4 and 7). Previous studies found the proportions of project values paid in bribes to be higher. In Pakistan, contractors reported paying 7% "commissions" (Rose-Ackerman, 1998). In the Iraqi Oil-for-Food contracts, such payments were termed "after sales service fees" and were fixed at 10% of the awarded contract value (Independent Inquiry Committee into the United Nations Oil-For-Food Programme, 2005). Overall financial losses due to corruption have been estimated to range between 5% and 20% of construction costs (Wells, 2015). However, the payments made in the case studies above were aimed to influence the award of contracts only. Other bribe payments, such as payments to obtain planning permissions, to obtain supervising engineers' quality of work certification, or to influence the design of the project are not included. The one exception is a mention of a potential payment of €20,000 to obtain the necessary certification for Alstom to receive payments for its work on Shoaiba projects. The values of bribe payments in the case studies, therefore, can be considered consistent with previous research, albeit they represent a smaller percentage of the projects, especially considering that the intermediaries retained a significant proportion. Past research rarely specifies the proportion of payments retained by the intermediaries.

The information on the payments made by consultants to the government officials is not always available in the FCPA prosecution documents. In case study 7, the payments known to have been made by the consultant to the officials totalled $3m, which is around half of the funds transferred by Alstom to the consultant. In the FCPA documentation describing Alstom's corruption scheme in the Bahamas (case study 4), it is explicitly stated that the consultant transferred around half of the funds he received to the government official. Although it is difficult to draw any conclusions about the amounts that Intermediaries in corrupt agreements retain for their services, the above two

case studies suggest that they might retain up to half of the fund they receive from companies.

The bribes paid to officials are often aggregated to show the total value. Each project, however, has a number of decision makers key to the award of the project. For example, four officials with different roles and responsibilities for the project were bribed in case study 1: a politician (Official 1) and several employees of the state-owned electricity company – the President Director (Official 2), a member of the evaluation committee (Official 3) and an engineer (Official 4). The exact nature of Advantages provided by each official is not always specified, but included disclosing confidential information to the briber and influencing the timing of the bidding process (see case study 8). That is, the officials circumvented various institutional procedures designed to ensure the project bidding was carried out fairly, and that the best company was selected to carry out the project. The sizes of bribes can be expected to vary depending on the position of the decision maker and the level of their responsibility for the project. Examples of individual bribes paid are $360,000 (Official 1, case study 1), half of $650,000 (Official 8, case study 4), $50,000 and $150,000 (case study 9).

The FCPA documentation on the Alstom Saudi corruption scheme (case study 3) also reveals the practice of hiring officials' relatives and friends with payments of up to $100,000 per year for zero productivity, in order to obtain projects. These funds could have been transferred to the officials. Alternatively, these friends and relatives could be the third-party Beneficiaries (see Section 4.3.6) from the corrupt schemes. The officials (DMs) could also then derive some non-monetary benefit from these transfers, such as repayment in favours in other spheres.

In most cases, Intermediaries (consultants) were used to transfer bribes to government officials for the purpose of obtaining projects. However, Representatives of Bilfinger gave bribes directly to the Nigerian officials in cash

(case study 9) and Alstom Representatives, in addition to using consultants, gave money and gifts directly to the Egyptian officials (case study 6).

The values of gifts were not set out in the FCPA documentation. Case studies 6 and 9 suggest that gifts were provided alongside bribes, and case study 1 suggests that officials judged the consultants' willingness to 'spend money' based on the entertainment and gifts they received.

Case studies also show that the choice of an Intermediary in corrupt agreements is important to the success of the scheme, and both the DM and the Representative must have sufficient trust in the Intermediary. PLN officials did not trust Consultant A and thought he would disappear after giving them "pocket money" (case study 1). Intermediaries are sometimes chosen from a circle of friends and family members of government officials. In case study 2, two of the Intermediaries were relatives of the Saudi officials. Consultant I was a close friend of Official 8 (case study 4). The exact functions fulfilled by these consultants are not always known, and they could be limited to the functions of a cashier, transferring bribes to the officials. Nonetheless, the case studies show the importance of a pre-existing network connection and trust between the officials and the individuals acting as conduits for bribes.

All 9 case studies present examples of organisational corruption, with well-routed corrupt structures at the top of the organisations. Key positions in the companies were occupied by individuals willing to circumvent institutional procedures and to offer bribes in order to obtain business. Internal processes to prevent corruption were not effective, and the USAID compulsory checks did not affect the corrupt agreements in the transmission and distribution projects (case study 6). In cases where internal accounting processes were in place, the employees who flagged that the lack of proof of services by the consultants violated the company's processes, were silenced (case study 6).

In several cases, the consultants' business was not relevant to the project they purportedly consulted on. For example, Consultant I in case study 4 sold furniture and leather, but was recruited by Alstom to obtain a power project. A Taiwanese company (Consultant J) that sold cigarettes, wine and pianos, was retained to help Alstom obtain a project on the Taipei's metro-rail system. These obvious red flags were ignored and did not prevent the corrupt agreements.

7.4 Application of the IAD framework to case studies

Section 4.3 applied the Institutional Analysis and Development (IAD) framework to corruption in general terms, using the information from literature reviews (Chapter 2). This section uses this general application to analyse the case studies.

This section is structured as follows. Section 7.4.1 summarises the actors, the positions they occupy and their actions. The types of corruption present in the case studies are reviewed in Section 7.4.2. The activities affected by corruption are discussed in Section 7.4.3, and the action situations are evaluated in Section 7.4.4.

7.4.1 Positions, actors and actions

The corrupt action situations took place in Egypt, Indonesia, Saudi Arabia, Taiwan, Nigeria and the Bahamas in late 1990s through to 2010. The first set of Transparency International's Corruption Perception Indices available for all six countries is 2011[10]. The perceived ability to control corruption ranged widely between the countries. Nigeria was in 143rd place out of 183 countries, where the first place means that a country can control corruption well. The Bahamas

---

[10] Corruption Perception Index 2011, Transparency International
https://www.transparency.org/cpi2011

scored much better and was in 21st place. The other countries were placed between the two: Taiwan was in 32nd place, Saudi Arabia – 57th, Indonesia – 100th and Egypt – 112th. Therefore, the countries varied widely in the perceived ability to control corruption.

The Transparency International's Bribe Payers Index 2011 (Transparency International, 2011) surveyed business executives to ascertain the prevalence of companies headquartered in different countries to engage in bribery. The companies in the case studies were headquartered in France (Alstom), Japan (Marubeni), USA (Bechtel and Willbros) and Germany (Bilfinger). Out of 28 countries considered by Transparency International, Germany and Japan ranked joint 4th, USA ranked 10th and France ranked 11th. Therefore, the country origins of the companies are not associated with particularly high risks of bribery according to Transparency International.

There are four main positions occupied by actors in the case studies – a Candidate, a Representative, an Intermediary and a Decision-maker (DM). The DMs had different functions in the infrastructure projects bidding processes and held positions in the government, were members of the evaluation committees or worked as engineers supporting the projects. They provided different Advantages to the Candidates, circumventing the institutional processes that were designed to ensure fairness of the process, and that the best company was selected to execute the project. Any individual DM did not have a monopoly power over the bidding process, and the combined actions of a number of DMs resulted in projects being allocated to Candidates through corrupt means.

The Candidates were the companies competing for infrastructure projects. The FCPA case documentation detailed the bribery schemes only of the companies and individuals who were prosecuted. It is possible that other companies competing for these projects attempted to bribe the officials, but these actions were not detailed in the documents. This raises the question of the criteria that were used by the officials in selecting the Candidates. On the one hand, the

DMs' actions can be reduced to the provision of Advantages in exchange for bribes. On the other hand, the DMs could have collectively decided on the company they wished to select, and worked to improve the chances of the preferred company. If this were the case, the criteria for selection could have included the companies' past track records, the perceived ability to successfully deliver the project, as well as the possibility for DMs' self-enrichment. If the chosen Candidate refused to cooperate and pay the bribes, the DMs had the power to manipulate the processes and award the contract to another company willing to pay bribes. The DMs then allowed the inflated bids (that incorporated the values of the bribes) to be selected, and authorised the payments.

The Representatives occupied senior positions in companies bidding for projects, and worked to ensure their Candidate (their company) received the project contract. Similarly to the DMs' institutions and organisations, the Representatives' companies had processes in place to prevent corrupt practices. These included internal checks on the consultants employed and the checks by the project financing organisations (e.g. USAID) on the conduct of the companies. These processes were only superficial, and the Representatives ignored the red flags. The Representatives circumvented the rules and procedures, and arranged the corrupt schemes.

The Intermediaries were the consultants recruited to negotiate, offer and transfer bribes. Multiple Intermediaries were used to transfer bribes to different DMs working on the same project. This could have been done to make it harder for corruption investigation authorities to trace the payments and connect them to the projects. Family and friends of the DMs were used to transfer the bribes in some cases. Their role can be that of an Intermediary. Alternatively, they could be third-party Beneficiaries (discussed in Section 4.3.5). The DM in this case could have been interested in the third-party Beneficiary's welfare and obtained an indirect benefit if the payments were made to this party. Where family and friends of Saudi DMs were hired by the Candidate (case study 3),

this could have been either a method of transferring bribes (in which case further transfers would have followed to the DMs), or the DM could have been interested in promoting the interests of the third-party Beneficiary (in which case no further transfers were made).

7.4.2 Types of corruption

The case studies show examples of grand corruption, involving politicians and large bribes in millions of US$. Additionally, there is an example of petty corruption in case study 3, where a Representative was prepared to authorise the payment of $20,000 to obtain the necessary certification.

The case studies show organisational corruption that involved violations of organisational rules which were laid down to enable the organisation to meet its goals (Hodgson and Jiang, 2007) (see Section 2.2.2). In case of the DMs, the rules of the organisations they held positions in were aimed at ensuring that the best company was selected to undertake infrastructure projects through a competitive and fair process. In case of the Representatives, the Candidate companies' rules aimed to ensure fair participation in bidding processes.

The Representatives' actions describe CO-type corruption (Corrupt Organisation) (Pinto et al., 2008) (Section 2.3.5). The individuals acted in consort for the benefit of the organisation (the Candidate). The DMs' actions have some characteristics of OCI-type corruption (Organisation of Corrupt Individuals). DMs were the main beneficiaries of corruption, obtaining bribes in exchange for circumventing organisational rules. However, their actions were not uncoordinated. Each individual Advantage provided to the Candidates was part of a larger scheme to ensure the overall aim was achieved and that the project was awarded to the organisation that paid the bribes.

The actions of the DMs provide examples of systemic corruption – organised sales of influence over the decision-making processes (Kaufmann, 1998)

(Section 2.2.2). That is, corruption relied on a well-functioning machinery underpinned by complex networks. These complex networks between officials are not described in detail in the FCPA documentation, but there are a few examples suggesting the underlying coordination between the DMs. For example, Official 1 had a well-established relationship with Official 2 (case study 1), and Asem Elgawhary had influence on the decision-makers at the organisation responsible for allocating infrastructure projects (case studies 7 and 8).

Social and family networks were also used to establish corrupt networks to enable bribe payments. In case studies 3 and 4, family members and friends of officials fulfilled the roles of Intermediaries to deliver bribes to the officials in Saudi Arabia and the Bahamas. This suggests a culture based on particularised trust and reciprocity discussed in Section 2.4.7. These cultures are characterised by mistrust of strangers, and religious or ethnic cues are used to ascertain who can be trusted. Particularised reciprocity also means a preference to maintain resources within a particular group (Persson et al., 2013). As the case studies show, family members and friends were used as trustworthy corrupt partners to establish corrupt networks. A proportion of the transfers to the Intermediaries were kept by them, meaning that these networks enabled the enrichment of the DMs' chosen corrupt partners as well as benefitting the DMs.

7.4.3 Activities affected by corruption

Section 4.3.2 in this thesis discusses the types of activities affected by corruption. The nature of the activity in the case studies is bidding for infrastructure projects. The bidding process can be interpreted as a constitutional-level activity, with Candidates (companies) competing for the position of a government contractor, to deliver the project. This places the action situation in the context that frames the actions as political or grand corruption (see Table 3).

Otherwise, if the bidding stage of projects were interpreted as a process of allocating some resource (project contract), this type of activity would belong to the operational level, with corrupt activities then described as petty or bureaucratic corruption (as shown in Table 3). However, the sums of money involved were large, in millions of US$, and often politicians and high-level executives were involved in the bribery schemes, which are not characteristic of petty corruption.

Therefore, the processes involved are better attributed to the constitutional level. Activities at this level determine who is eligible to participate in collective-choice activities. Collective-choice level of activities in the IAD framework refers to activities that develop rules of how resources are distributed at the operational level of activities. If the ultimate resources in the case studies are energy, transportation and gas, then the infrastructure delivery process can be interpreted as the process determining resource availability to the population, and its reliability. Constitutional-level activities, then, determine which companies are part of this process of designing the infrastructure and participating in its construction.

In the IAD framework, the rules guiding the constitutional-level activities change at the slowest pace compared to the rules guiding the other two levels of activities. Even though the project bidding stage can be structured as different types of auctions and can be designed differently for each project, the underlying principles, and the criteria against which companies are assessed tend to change infrequently. If the willingness to pay a bribe is the guiding principle, it can take a long time to redesign the bidding process, and re-define the responsibilities to prevent corrupt officials from having control over the bidding, in order to change the corrupt nature of the process.

Multiple DMs provide different Advantages and it is the sum of their actions that results in the corrupt award of the project. This points to the importance of separating the corrupt Advantages provided by DMs from the ultimate award

of infrastructure projects in the analysis of corruption. It shows more clearly which processes were circumvented. If the bidding process is to be reviewed and changed to prevent future corrupt occurrences, this will involve a shakeup of every organisation involved in the process, including the political institutions, not just the organisation or the government department responsible for the bidding stage of the project.

7.4.4 Evaluation of the action situations

Table 1 in Section 4.2 sets out the criteria for evaluating action situations. This section evaluates the actions of the DMs and the Representatives that affected the constitutional-level activities and sets out the possible institutional changes to improve the outcomes in future infrastructure project bidding.

The states of the world resulting from action situations can be evaluated according to the criteria of economic efficiency, fiscal equivalence, equity or sustainability. However, there is insufficient information contained in the FCPA documentation to evaluate the outcomes according to these criteria. That is, the outcomes of the corrupt schemes are provided – the companies who paid bribes obtained the projects – but the ways in which the projects themselves were affected are not detailed. Presumably, the criteria of economic efficiency were not met, as the projects costed more because the bids included the economic rents distributed to the Intermediaries and the DMs. However, a full analysis and evaluation of the outcomes is not possible.

An alternative method of evaluating action situations using the IAD framework is by considering the sets of actions taken, and evaluating these against the criteria of legitimacy, accountability or conformance to the relevant norms or values. Accountability refers to the extent to which individuals can be held responsible for their actions. Legitimacy means the extent to which actions conform to legal or normative rules. Finally, conformance to norms or values is

a test of whether the actions met the commonly held norms or values (see Table 2).

The actions of the DMs and the Representatives in the case studies constituted corruption, and the functions of the Intermediaries were to facilitate it. International organisations and their member countries have devoted significant efforts to prevent these practices. Organisations such as the OECD set out recommendations for member countries to improve public integrity (OECD, 2017), provide good practice guidance to companies for prevention of corruption in international transactions (OECD, 2010) and monitor countries' progress in adopting and implementing the recommendations for corruption reduction (OECD, 2011a). Therefore, the case studies show actions that are generally considered illegitimate.

The FCPA court cases show that the companies and some of their employees were prosecuted for their actions, and received penalties in the form of fines or imprisonment. The identities of the DMs and the Intermediaries are not disclosed in the documentation, and it is more difficult to ascertain whether they were held accountable for their actions. There are a few examples of the prosecutions of the DMs. One of the DMs, Asem Elgawhary (case studies 7 and 8) was prosecuted in the USA under the FCPA. Additionally, the Indonesian press shows that one of the officials involved in the corrupt scheme in Indonesia (case study 1), Emir Moeis (Official 1) was prosecuted in Indonesia[11]. There are no known prosecutions of the Intermediaries who fulfilled crucial roles in the corrupt networks.

From the point of view of morality or conformance to the generally-accepted norms and values, the actions of the DMs, Intermediaries and the Representatives can be evaluated from two points of view. As outlined above,

---

[11] Jakarta Globe: Court sentences Emir Moeis to three years for graft. 14 April, 2014. http://jakartaglobe.id/news/court-sentences-emir-moeis-three-years-graft/

the international community looks to curb corrupt practices. However, corruption in infrastructure projects remains prevalent. In such a high-corruption environment, norms against corruption may be weak, despite the attempts to institute systems of checks and balances to prevent future corruption. Accepting a bribe can also be seen as culturally acceptable in such an environment (Section 6.2.4).

Assuming that action situations are evaluated against the international community's view that corruption is unacceptable, the actions of the DMs, Intermediaries and the Representatives do not meet the criteria of conformity to the relevant norms and values. According to the IAD framework, institutional changes to prevent future occurrences of corruption can be made by re-formulating the rules of the action situation. These rules are discussed in Section 4.2 and set out, for example, which actors can participate in the activities. Making institutional changes can mean, for example, preventing companies or officials that engaged in corruption from participating in future project bidding processes. However, in cases of organised corruption described above, the problem is not limited to a few bad apples, but is systemic. Excluding a few of the individuals or companies from the bidding process may not be effective.

The rules of the organisations need to incorporate systems to prevent corrupt practices. As Alstom case studies demonstrate, anti-corruption checks were in place, but these were superficial, and were not implemented effectively. As noted in Section 7.4.3, project bidding processes can be classed as constitutional-level activities and the rules guiding such activities take a long time to change. Institutional culture also changes slowly, and individuals may collude to sustain the system of implementation of unspoken rules (Section 6.2.5).

Anti-corruption guidelines and recommendations created by organisations such as the OECD would, therefore, need to be built into the institutional rules

and processes over a period of time, and these will take time to take effect. Attempts to change corrupt practices by simply setting out the new rules of the institutions without developing the rules in coordination with those who are expected to implement them can be ineffective, as individuals continue to follow the focal points (rules of thumb) of behaviour.

Individuals internalise and adopt organisational rules if they agree with them and perceive them as legitimate (Sections 2.4.6 and 6.2.5). Therefore, anti-corruption rules and processes need to be consistent with the culture of the organisation, developed with impartiality, and allow an appropriate level of discretion to those who are expected to apply them.

A combination of organisational controls and collective action methods of corruption reduction would be needed to effectively change the corrupt culture of organisations (Sections 2.4.6 and 2.4.7). The organisational controls methods are training, communication of organisational values and reinforcement of expected behaviour, combined with vigilance controls and encouragement of constructive deviance and whistleblowing. Collective action methods are aimed at fostering trust and improving collective monitoring. Such methods include formal agreements between governments and private companies to refrain from corruption (Marquette and Peiffer, 2015). Such agreements rely on the transparency of systems, and the processes of infrastructure delivery would, therefore, require increased transparency.

7.5 Conclusions

This chapter presented case studies of corruption in infrastructure projects. As discussed in Chapter 1, the infrastructure sector is particularly vulnerable to corruption because of the complexity of the projects and because the infrastructure procurement processes are often not transparent. The projects often have multiple phases, and the systems of sufficient oversight can be

difficult to establish. New projects are created infrequently and at irregular intervals, meaning that the financial viability of companies working in the sector may heavily rely on winning the project.

The case studies presented focused on the bidding stage of infrastructure projects in several countries - the Bahamas, Indonesia, Egypt, Taiwan, Saudi Arabia and Nigeria. The information contained in the documentation filed to support prosecutions under the US Foreign Corrupt Practices Act 1977 was used to create the case studies. The FCPA documentation does not systematically provide the same details, and omits some of the information. For example, the project values and the bribe sizes are not always known. However, each case study provides a different insight into the corrupt schemes.

The case studies show that multiple consultants are often used as Intermediaries to transfer funds for bribes to foreign officials to obtain government projects. Intermediaries sometimes have pre-existing connections with government officials, and can be their family members or friends. Where corruption is the chosen method for infrastructure companies to gain projects, the internal company checks designed to prevent corrupt practices are not effective, and the red flags associated with, for example, retaining consultants from sectors other than the project sector, are ignored.

Corruption in infrastructure projects involves multiple officials across several organisations, including political institutions. Therefore, institutional changes to prevent corruption require time to implement successfully, and the rules designed to prevent corruption need to be perceived as legitimate to be effective. A combination of organisational controls and collective action methods of corruption reduction would be required to shift the well-established corrupt practices in the infrastructure sector.

8 Discussion

8.1 Introduction

The analytical tools and methods used in this thesis, and, in particular, the Institutional Analysis and Development framework, belong to the organisational or meso-level approach of studying social phenomena. According to this approach, individual behaviour is seen as the product of organisational culture (see Section 2.3.5). However, the organisational-level approach also allows the analysis to take into consideration micro-level causes of corruption such as individual bad character (Section 3.4), and the methods used in this thesis analysed behaviour as being the product of both autonomous decision making and the organisational or societal norms. The proposed methods of corruption reduction in this thesis are focused at changes at institutional or organisational levels.

This chapter evaluates the contributions of this thesis. The application of the IAD framework to corruption in this thesis offered a number of insights, and brought the focus on the factors that received less attention in past literature. These insights are discussed in Section 8.2. The assumptions underlying the models presented in this thesis are evaluated in Section 8.3. A conclusion is made that assumptions prevalent in past literature may be more applicable to petty corruption, and do not fit corruption in the bidding phase of infrastructure procurement. The insights offered by case studies into the anti-corruption enforcement actions are summarised in Section 8.4. The proposed methods of corruption reduction based on the case study analysis are presented in Section 8.5 and Section 8.6 concludes.

8.2   Methods of analysing corruption in this thesis

This thesis analyses corruption at organisational level. The Institutional Analysis and Development framework is used to identify the main components of corruption. This reveals a number of factors that have not been widely discussed in past literature. For example, the analysis makes a distinction between the corrupt acts and the underlying activities that are affected by corruption (Section 4.3.2). The analysis of the case studies then shows that the infrastructure bidding process can be analysed as a constitutional-level activity with companies being chosen for the position of a government contractor, and the rules guiding these activities change at a slow pace (Section 7.4.3). Therefore, any anti-corruption proposals in this sphere need to take into account that any change can only be gradual and takes time to take effect.

The separation between corrupt Advantages and the underlying objective for corruption showed that multiple officials from various organisations may be bribed in exchange for a favourable decision, and the sum of these actions produces the outcome of the company winning the project. This approach to analysing corruption can reveal more clearly which processes are circumvented. Corruption reduction requires a review of the processes in multiple organisations, including political institutions, and should not be limited to the organisation directly responsible for overseeing the bidding for projects.

The separation between the two corrupt actions, bribe acceptance and the reciprocation with a favourable decision, led to the analysis of the different considerations underlying the two actions. Model 2 was developed based on this analysis (Chapter 6). The possibility of being denounced to authorities for attempted bribery is relatively common in past models of corruption. The possibility of the official reneging on the promise of a favourable decision is considered less often. Model 2 suggests that if this possibility is considered, the likelihood of a corrupt offer being accepted increases (the simulated rejections of bribes decreased from 273 to 193 out of 1000 when the decision

of whether to renege on the promise was introduced into the simulations in Section 6.4). Therefore, the two actions and the motivations behind them should be considered separately, and future studies can focus on the motivations behind providing an unfair advantage separately from bribe acceptance.

Intermediaries play an important role in corrupt networks and they allow the briber and the bribe-taker to distance themselves from each other. Their functions have been discussed in past literature, but the criteria for selecting an agent to act as a corrupt Intermediary have attracted less attention. Model 1 in Chapter 5 is based on the beliefs of the bribe giver that the agent he/she considers recruiting as an Intermediary is trustworthy and competent. These beliefs in the model are based on the pre-existing network connection between the bribe-giver and the agent. The model suggests that a social connection fostering goodwill trust between the two is necessary for the Intermediary to be recruited in highly corrupt environments.

Model 1 also moves away from the conventional payoff-maximising assumptions of the game theory models. Such assumptions may not be applicable when modelling behaviour driven by norms. Version 1 of the model considers objective-driven behaviour, with the bribe-giver comparing different methods of corrupt offer delivery to maximise the perceived chances of a successful corrupt agreement. However, game theory techniques may not be the most suitable method of representing objective-driven behaviour guided by norms. Version 1 of Model 1 produced functions that could not be reduced, and provided little insight into the strategic choices of corrupt offer frames. Version 2 of the model then introduced payoffs, but the resulting equations were difficult to manage.

Therefore, simulation modelling was used in Model 2 to analyse the decision making processes of an official offered a bribe. The model explores the norms of behaviour triggered in corrupt agreements and proposes a method of

analysing social norms conflict and its resolution. The model also shows how monetary payoffs and the costs associated with breaking social norms can be represented within one model. Model 2 can be classed as a simulation model representing objective-driven behaviour. That is, determinants of behaviour such as group norms and social expectations form the basis of the model. However, the agent cannot meet every objective, and the weights of the factors determining behaviour are assessed and the decisions are made based on the strongest motivations.

8.3 Validity of model assumptions

As with all models, the results of the models presented in this thesis heavily rely on the accuracy and the validity of the underlying assumptions. For example, Model 1 is based on the notion that the bribe-giver decides on whether the Intermediary is used to deliver the bribe. Model 2 sets out the norms of behaviour that are assumed to guide the decisions of the bribe-takers. This section assesses the key assumptions of the thesis models.

The actions constituting corruption set out in Section 4.3.4 are consistent with the actions set out in anti-bribery legislation. For example, under the UK Bribery Act 2010, it is sufficient to request, agree to receive or accept a bribe to have committed a bribery offence[12]. This corresponds to the first of the two corrupt actions by a DM set out in Chapter 4 (see Section 4.3.8). It is also sufficient to offer a bribe to have committed an act of bribery, even if the offer is not

---

[12] Bribery Act 2010 c. 23 Section 2 (2) "*Case 3 is where R requests, agrees to receive or accepts a financial or other advantage intending that, in consequence, a relevant function or activity should be performed improperly (whether by R or another person)*".

accepted[13]. The Bribery Act 2010 recognises that a bribe does not have to be provided to the official, but can be given to a third-party Beneficiary[14].

Although there are variations in the phrasing of legal statutes, a common understanding is that an official who accepts a bribe and reciprocates with some illicit service for the briber would be considered to have acted corruptly. Generally, it is thought that the two actions must be linked (OECD, 2008, p.37). That is, the official accepts a bribe intending, in return, to perform some illicit service. An example where this link is particularly important is in the 1990's legislation of Chile. In 1990's, accepting a payment by an official was not a criminal offense in Chile, unless it was accompanied by other illegal activities (Rose-Ackerman, 2010b, Hepkema, 1997). This suggests that if an official accepts a bribe intending to then renege on the deal, it may not constitute corruption according to some views. As discussed above, in more recent legal definitions of corruption, such as the UK Bribery Act 2010, acceptance of a bribe can by itself constitute a criminal act. Therefore, the corrupt acts set out in Chapter 4 and represented in models in Chapters 5 and 6 are consistent with the more recent interpretations of what it means to act corruptly.

Models 1 and 2 in Chapters 5 and 6 are based on the assumptions common to models in past literature. For example, Model 1 assumes that there is one official with a monopoly power over a process, and if they provide an unfair Advantage, this leads to the project being allocated to the briber. This assumption is common in past studies, and can be typical in cases of petty corruption. The case studies, however, show that in large infrastructure project bidding processes there are multiple decision makers, and it is the sum of their actions that ensures that companies retain contracts. Future models, therefore,

---

[13] Bribery Act 2010 c.23 Section 1 (2) *Case 1 is where – (a) P offers, promises or gives a financial or other advantage to another person, and (b) P intends the advantage – (i) to induce a person to perform improperly a relevant function or activity".*

[14] Bribery Act 2010 c.23 Section 1 (4) *In case 1 it does not matter whether the person to whom the advantage is offered, promised or given is the same person as the person who is to perform, or has performed, the function or activity concerned".*

could consider more complex corrupt networks, with multiple advantages being sold.

Model 1 also assumes that the choice of a frame of a corrupt offer, a bribe or a gift, is made strategically by the bribe-giver. The assumption is made based on past research (Søreide, 2007). This, again, can be more representative of petty corruption. Case studies suggest that in large infrastructure projects gifts can be used to show the willingness and the ability to pay bribes, and to secure the officials' trust. Therefore, gifts may be given alongside bribes, not instead of them.

An assumption is made in Version 2 of Model 1 that the value of the contract is given exogenously, and the company bidding for the project does not manipulate the project value. However, case study 9 shows that project values can be inflated to incorporate the bribes distributed to the officials. The values of large infrastructure projects are, therefore, better represented within formal models as a function of the bribes given. Additionally, Intermediaries can retain a large proportion of the sums transferred to them. Future models could explore the payoffs of the Intermediaries in more detail.

Model 1 considers the importance of the network connection between the bribe-giver and the Intermediary. However, the case studies show that often the connection between the official and the Intermediary is key to a successful corrupt agreement. A possible area of future work is to analyse how officials decide on which intermediary is used in corrupt networks, and the importance of trust between the official and the intermediary.

The prevalence of corruption, however, can determine whether an intermediary is used. The results of Model 1 suggest that in high-corruption environments bribe-givers could be more likely to establish a direct corrupt agreement, and pay bribes directly to the official. This is based on the assumption that in high corruption environments, acceptance of a bribe is already highly likely. A

successful corrupt agreement, then, relies less on the function of the intermediary in increasing the likelihood of bribe acceptance. Case study 9 shows an example of an environment perceived to be highly corrupt (Nigeria ranked the lowest of the countries considered according to the ability to control corruption, Transparency International's CPI). The choice of a direct corrupt offer can have several reasons. In high-corruption environments, corruption is a well-established norm of behaviour, and moral costs associated with accepting bribes can be low. Therefore, one of the functions of the intermediaries of reducing these moral costs might not be important. Case study 9 also shows that the payments were made in cash. Using consultancy companies and paying in cash could be substitutes in corrupt agreements, and cash may be used in more corrupt environments.

Therefore, the assumptions of past models may not be directly applicable to the infrastructure sector. Case studies provide useful insights into how corrupt networks operate in this sector. Future work can analyse other cases to gain further insight into decisions made by the individuals, and how the environment shapes their choices.

The outputs of the models are determined by the assumptions made. As shown above, several assumptions did not fit the infrastructure sector setting. The case studies also did not reveal how, for example, the sizes of bribes and gifts vary across settings and with varying social connections between the corrupt agents. A larger dataset would be required to carry out a full validation of these model results.

8.4   Case studies insights into enforcement actions

There are several objectives that can be fulfilled by corruption in infrastructure procurement, and any stage of a project can be affected (Section 7.2). However, the FCPA prosecution cases reviewed in Chapter 7 are all based on

corruption that occurred at the bidding stage. Financial rewards from individual acts of corruption are highest at the early phases of project cycles (Hawkins, 2013) (Section 7.2), and this could be the reason these cases are prevalent in FCPA prosecutions. As the companies' gains from corruption in the bidding processes were high, the fines that can be levied or disgorgements imposed on companies can also be high. The US government can, therefore, receive large amounts from companies found guilty, and this can finance the high costs of corruption investigations.

This can mean that only corruption schemes in large projects and only in certain infrastructure project phases attract investigations and prosecutions. Smaller schemes could go unpunished, and the effectiveness of the systems of monitoring and punishment would vary across project types and project stages. Nonetheless, there have been over 500 prosecutions under the FCPA with fines of up to $772m (Stanford Law School, 2018) (Section 7.3.1) which can have a deterrent effect on companies from engaging in corrupt schemes.

FCPA prosecutions target the bribe-paying companies and its officers (TRACE International, 2016), but foreign government officials are outside the statute's scope. Asem Elgawhary was prosecuted as an officer of the company hired to oversee the bidding processes on behalf of an Egyptian government organisation. Therefore, the countries where infrastructure projects are carried out are left to establish and enforce the systems of corruption monitoring and punishment to hold public officials to account. The FCPA court cases considered also do not disclose the identity of the consultants who facilitated bribe negotiations and transfers, and it is not known whether these individuals were prosecuted.

The case studies considered all relate to the actions of large companies in the bribery schemes. How the money is then laundered and hidden in jurisdictions that keep the beneficiaries of companies secret is the topic that has attracted public attention since 2015. Paradise papers and Panama papers were leaks

of documents showing companies holding vast amounts of money, based in jurisdictions such as the Cayman Islands and the Seychelles, and connected to politicians (Antony Seely, 2017, O'Donovan et al., 2018).

The International Consortium of Investigative Journalists[15] (ICIJ) is one of the organisations working to identify the possible schemes used to launder the proceeds of corruption. Figure 18 shows an example of a network of companies connected to a Nigerian politician, James Ibori. He was a governor of Nigeria's oil-rich Delta State from 1999 to 2007. Ibori and his family members were the beneficiaries of a number of companies including Julex Foundation based in Panama. The network of companies was used to launder $75m out of Nigeria to purchase 6 houses in London, a fleet of luxury cars and a jet. Ibori pled guilty in London to charges of corruptly obtaining and laundering $75m, but the size of the funds embezzled are thought to be as high as $250m[16].

---

[15] https://www.icij.org/

[16] https://www.icij.org/investigations/paradise-papers/explore-politicians-paradise-papers/
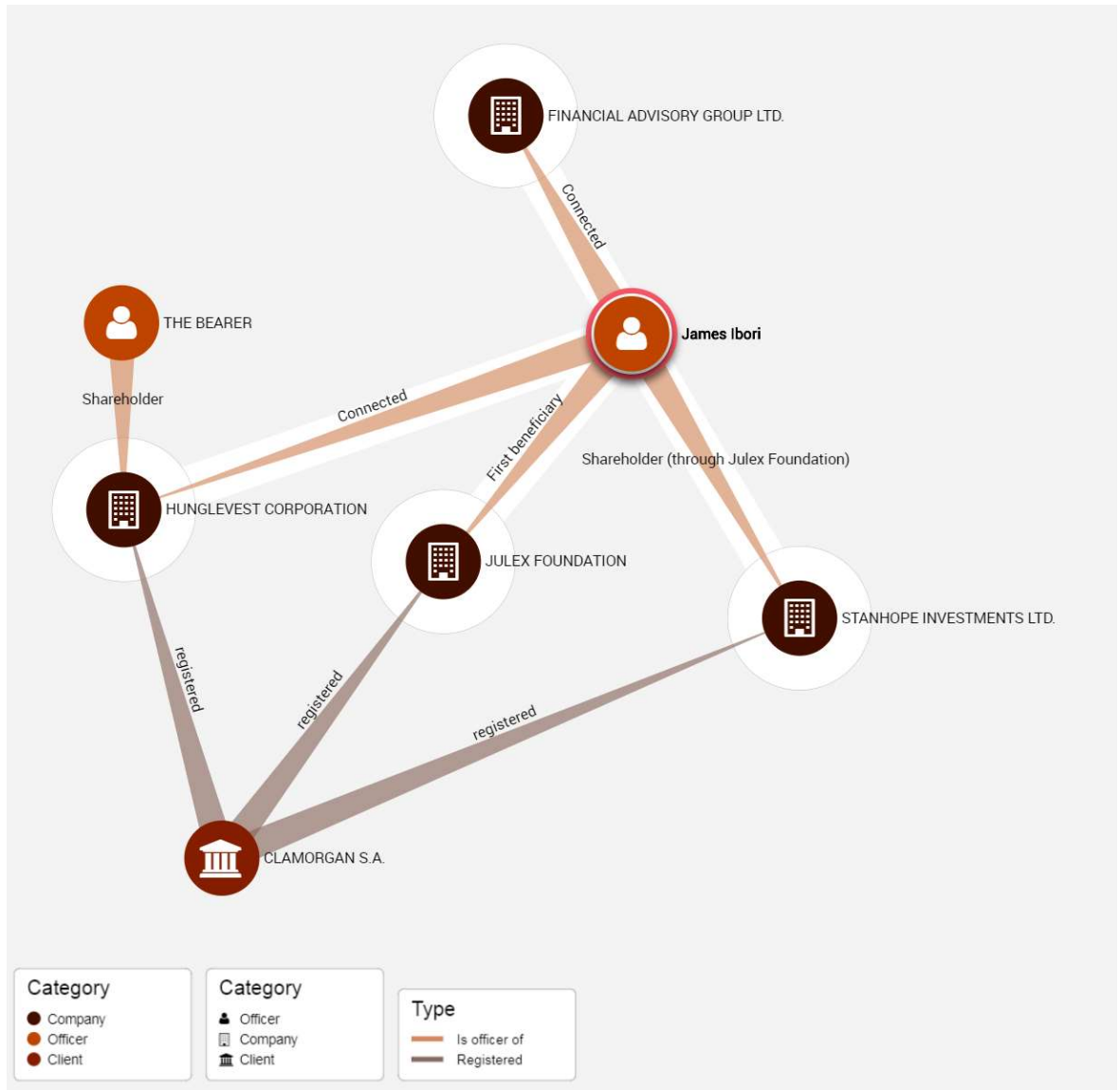
**Figure 18 Companies connected to James Ibori, Nigeria's politician.
Source: ICIJ[17]**

These investigative efforts disclose the connections between multi-million dollar companies and the politicians controlling them, to help identify possible cases of corruption and embezzlement. However, this information is not proof

---

[17]   International   Consortium   of   Investigative   Journalists https://www.icij.org/investigations/paradise-papers/explore-politicians-paradise-papers/

of corruption, and the disclaimer on the ICIJ website states that the companies are thought to be legitimate, and there is no suggestion that they have been used to commit crime. Nonetheless, these revelations can lead to investigations to ascertain the sources of wealth.

Additionally, opaque company structures that hide who owns, controls or benefits from companies and their assets can enable the corrupt officials to launder proceeds of corruption. There is pressure on jurisdictions that keep the identities of the beneficial owners of companies hidden to improve transparency of their corporate systems. For example, Financial Action Task Force (FATF)[18] set out the recommendations to prevent money laundering, including a recommendation to improve transparency of companies. FATF Member countries are periodically evaluated against the criteria set by the FATF.

As shown by the case of Ibori, prosecutions may be undertaken against the corrupt officials in countries other than the ones where projects were based. The efforts of civil society organisations such as ICIJ can also lead to investigations of corruption and money laundering around the world. However, it is also important to set out mechanisms to prevent corruption, and this is the topic of the next section.

8.5   Corruption reduction measures

Although the models developed in this thesis were based on assumptions that could better fit petty corruption rather than grand corruption of the infrastructure sector bidding processes, the analysis using the IAD framework carried out in

---

[18] http://www.fatf-gafi.org/

Section 7.4 provided useful insights into possible measures to reduce corruption (Section 7.4.4).

The efforts to reduce corruption often involve instituting top-down controls. The international community and the organisations such as OECD can create pressure on countries and international companies to reduce corruption through creating institutional checks to identify red flags of possible corruption. However, the effectiveness of such measures are varied across countries (Persson et al., 2013). As the case studies in Chapter 7 demonstrate, companies might implement anti-corruption measures only superficially.

The analysis of the case studies using the IAD framework in Section 7.4.4 suggests that the rules guiding the infrastructure bidding processes can take a long time to change. That is, the corrupt practices used by both the public officials and the bidding companies can be resilient to change, and for anti-corruption measures to be effective, substantive changes are required.

Multiple governmental and political institutions are involved in the process of project awards and determine the allocation of projects. Corruption in such settings is not characterised by the existence of just a few bad apples. Successful corrupt schemes require networks of individuals in the positions of power for a coordinated sale of advantages. Focusing efforts on preventing corruption in the institution directly involved in the award of the contracts may not be effective overall. An analysis of all the favourable decisions made in exchange for bribes can aid in determining which practices were circumvented, and re-designing multiple institutions including political organisations may be necessary for anti-corruption measures to be effective.

In companies competing for projects in the case studies, the institutional processes were in place to detect possible corrupt practices. However, senior executives had no doubt that the practices they engaged in constituted corruption, and the red flags did not have a deterrent effect. This suggests that

the executives did not subscribe to the anti-corruption norms, and did not perceive the institutional rules aimed at preventing corruption as legitimate principles of doing business.

This shows that for anti-corruption rules to be accepted and internalised, individuals who are expected to apply them have to agree with them. They must be perceived as legitimate and right. Designing institutional rules that aim to change corrupt culture requires consistency with the wider organisational culture, impartiality and the appropriate level of discretion in rule application. A change in culture is a process that can happen only gradually, and institutional changes require a phased-in approach. Otherwise, the corrupt behaviour rules of thumb may prevail and the changes would not be effective.

The infrastructure sector is characterised by high competitive pressures, and winning a project can determine the financial viability of the company. In such environments, the principles of integrity and fairness can be hard to instil. A combination of organisational and collective-action approaches to reduce corruption may be required. The organisational approaches of anti-corruption training, reinforcement of expected behaviour, creation of vigilance controls and encouragement of whistleblowing are important, but may not be effective by themselves. Collective-action approaches propose creation of systems of collective monitoring. These methods rely on all parties to subscribe to the notion that preventing corruption can lead to a better outcome for all parties.

Formal agreements to avoid corruption between governments and the companies competing for infrastructure processes could foster trust between the parties. All parties would need to perceive these agreements as worthwhile, and the rules underlying the procurement processes need to be perceived as legitimate. For collective monitoring to be effective, the infrastructure processes need to be more transparent. The public, the governments and the infrastructure sector companies can then monitor behaviour and this can create

trust in the infrastructure processes and this can drive the sector towards a fairer environment.

8.6   Conclusions

This chapter reviewed key insights and contributions of the thesis. The Institutional Analysis and Development framework applied to corruption yielded useful insights that then formed the basis of the models developed. Although the assumptions of the models were based on past literature, and better fit petty rather than grand corruption prevalent in large infrastructure projects, the models provide new methods of analysing corrupt behaviour.

The models represent agents as rule- or objective-driven. Model 1 shows that game theory may not be the best framework within which to represent rule-driven behaviour. However, Model 2, developed as a simulation model was more successful. The model shows how social norm conflict can be represented, and how this conflict can be resolved. The model enables the analysis of behaviour in the presence of opposing motivations, where the strongest motivation prevails.

The case studies provided insights into corrupt networks in infrastructure procurement processes. The IAD framework was applied to case studies based on FCPA documentation. The proposed methods of reducing corruption are then based on organisational and collective-action methods such as creation of organisational controls, combined with collective monitoring, trust-building, improvements in perceived legitimacy of infrastructure processes and transparency of systems.

9 Conclusions, recommendations and further research

This thesis set out to develop a concept within which different factors associated with corruption can be gathered and linked, and then to apply this concept to the bidding phase of infrastructure procurement. The literature review of past research on corruption helped to identify several research gaps and three research questions were identified for this thesis:

1. What strategies do bribe-givers use to achieve successful corrupt contracts?

2. How do social norms affect bribe-takers' choices?

3. What are the characteristics of corruption specific to the infrastructure sector and what measures of corruption reduction can be effective in this sector?

After considering the different approaches used in past corruption research across several disciplines, and in light of the research questions, the organisational level of study was adopted for the development of the concept of corruption. The Institutional Analysis and Development framework was selected as the toolkit to aid the creation of the concept within which particular aspects of corruption can be analysed more closely. The focus of this work was on the individuals, their actions and the setting in which corruption occurs.

The concept was then used to develop two micro-level models of corrupt behaviour, to address the first two research questions. Chapter 5 focused on the bribe-givers' strategies to address the first question. Past literature discussing strategies of the bribe givers was reviewed and a game-theory model was developed representing a bribe-giver with the objective of maximising the chances of securing a successful corrupt agreement.

This game theory model moved away from the conventional payoff-maximising assumptions and considered behaviour as objective-driven. The model showed that game theory techniques may not be suitable to analyse behaviour in the contexts where norms play an important part. In addition, several underlying assumptions of the model were shown through case studies to be not altogether applicable to the specific scenario of the bidding phase of infrastructure projects. Nonetheless, the model provides several insights into the possible strategies of the bribe-givers, and suggests that in high-corruption environments bribe-givers could be more likely to seek to establish a direct corrupt agreement, and to pay bribes directly to the officials rather than using a third party to broker the deal.

The second model of the thesis, developed in Chapter 6, moved away from game theoretic methods and turned to social simulation to analyse social norms of behaviour in the context of corrupt agreements, to address the second question of this thesis. Decisions of bribe-takers are represented in this model as driven by both self-interest (greed) and social norms. The model shows decision making processes of autonomous agents, but with norms and organisational rules also framing behaviour. The content of the relevant norms was explored through reviewing past theoretical literature on social norms, as well as evidence from past experimental studies of corruption.

Different motivations can produce an internal conflict for a decision maker, and the model captures how this conflict can arise, and how it can be resolved. The model results draw attention to the importance of separating the different actions of the bribe-takers, and studying them independently. This approach produces insights into the possible reasons for opportunistic behaviour of the bribe-takers, and how the minimum acceptable bribe levels could vary in different contexts.

The developed concept of corruption was then applied to case studies in Chapter 7. The source used to develop the case studies was the

documentation submitted in support of prosecutions under the US Foreign Corrupt Practices Act 1977. This proved to be a useful source of information, offering detailed, albeit fragmented, accounts of corrupt schemes carried out by several companies in countries including Indonesia, Saudi Arabia and Nigeria. It specified the amounts paid in bribes, the types of infrastructure projects that were affected, the numbers of intermediaries used to broker the corrupt deals, and the different methods used for bribing government officials. The case studies showed that intermediaries can play an important part in creating corrupt agreements, and can retain significant proportions of bribe payments transferred to them. The intermediaries appear to be more closely associated with the bribe-takers than the bribe-givers, and can be government officials' friends or family members.

The case studies also provided insights into the way corruption in bidding for infrastructure projects manifests itself. In the cases considered, corruption was a systemic problem, and multiple high-ranking officials across several government organisations were bribed in exchange for the ultimate award of the contract. This suggests a high level of coordination between the officials and a systematic selling of favourable decisions. Each official had a certain decision-making role in the process, but none had the overall monopoly in the award of the contract.

Case studies also showed that the companies bidding for infrastructure projects had established systems of red flags and checks to prevent corruption. However, these appeared to be only superficial and were circumvented by the senior executives who created and authorised methods of bribe payments to government officials.

Recommendations

This thesis offers a number of insights and recommendations for the practitioners responsible for physical infrastructure procurement, the policy

makers looking to develop effective systems of corruption prevention, and scholars across different disciplines looking to better understand corruption in the infrastructure sector.

The recommendations for scholars are to draw on the insights from different disciplines in approaching the subject of corruption; to consider alternatives to payoff-maximising assumptions in developing models of corrupt behaviour; and to revisit the underlying assumptions prevalent in past studies to assess their applicability to the infrastructure sector, and the bidding processes in particular.

Corruption is often either analysed in general terms, or a specific type of corruption is considered, to study certain aspects of corrupt behaviour. An analysis of corruption at the level of organisations enables for the research to incorporate insights from different disciplines, and this provides a broader view of corruption, and its underlying causes. This then enables the researcher to better assess the specific characteristics of the corruption phenomenon under investigation and to provide more focused recommendations for corruption prevention. For example, the characteristics ascribed to corruption in infrastructure procurement in past literature may better fit petty corruption, whereas the analysis in this thesis shows that grand corruption is a better representation of corruption in this setting.

Payoff maximising assumptions may not be appropriate for modelling corrupt behaviour. The traditional economic methods do not provide sufficient flexibility for the incorporation of important aspects of behaviour such as normative considerations. An alternative offered in this thesis is a representation of individuals within a social simulation model as driven by both self-interest and the norms and rules of society and organisations. This allows the consideration of motivations other than self-interest, and produces insights into the ways behaviour can be shaped by the context in which it occurs. Therefore, scholars could benefit from exploring such methods in future research.

One of the key assumptions in past studies of corruption is that officials' monopoly powers are a prerequisite for corrupt behaviour. However, in infrastructure procurement each corrupt official is shown in this thesis to act in cohort with other officials, across several organisations, to ensure that the contract is awarded to the bribe-payer. Although, collectively, this group of officials can be thought of as holding a monopoly over the process, the incentives behind their individual actions can be different, and each one provides a different type of an advantage that overall results in the corrupt contract award. The disaggregation of this cohort of individuals within formal models, then, can reveal to the scholars the different strategies used by the bribe-taking officials for corrupt sales of infrastructure contracts.

The recommendations for the practitioners are to be alert to the possibility that coordinated sales of contracts are taking place in infrastructure procurement; to design the procurement processes in light of the potential well-rooted culture of corruption; and to consider whether officials' friends and family members are used as conduits for corrupt exchanges.

If the tendering processes are vulnerable to corruption, the problem may not lie in a few 'bad apples' interfering with the process. It can take the form of a coordinated sales of favours across multiple organisations. Therefore, any changes to the procurement process the practitioners look to introduce to tackle the problem may need to address the interconnected nature of the sales of advantages and favours that result in a corrupt contract allocation. Focusing on the organisation responsible for the contract award alone may be insufficient to reduce corruption in this sector, and may not have a long-lasting effect.

For the detection of corruption, the practitioners need to better understand the role of the corrupt intermediaries. Where bribe-taking among the suspected corrupt officials cannot be identified, the attention could be turned to the potential role of the friends and family members of these officials as conduits for bribes.

The recommendations for the policy makers are to recognise that a review and reshaping of the processes in multiple organisations may be required to reduce corruption in the infrastructure sector; that new anti-corruption regulations can result in superficial systems of checks being implemented; that these regulations need to be developed with the wider culture in mind, and should be accompanied by anti-corruption training; and that transparency in infrastructure procurement is an important component in building trust in the processes and the sector.

In developing policies to prevent corruption, due consideration should be given to the multiple organisations involved in the allocation of infrastructure projects. The focus, therefore, should not only rest on the contract awarding organisation, but should include other institutions, including political structures, to identify the scope of the policy change required.

Where regulations are being designed to prevent corruption, these can result in only superficial compliance mechanisms being established in companies bidding for infrastructure projects. The rules being developed need to take into consideration the pre-existing culture, and need to be designed with impartiality, allowing an appropriate level of discretion to the individuals expected to apply them.

Changing the corrupt culture takes a long time to achieve, and requires a gradual phased-in approach to take effect. The new requirements need to be accompanied by organisation-level anti-corruption training, reinforcement of expected behaviour, and the creation of vigilance controls and whistleblowing systems.

Collective monitoring, involving public engagement, is also an important aspect of the development of trust in the procurement processes. This requires further transparency of the infrastructure sector, to improve the perceived legitimacy of infrastructure procurement processes.

Further research

The analysis of the court cases prosecuted under the US Foreign Corrupt Practices Act 1977 produced useful insights into the nature of corruption in infrastructure projects. Future research can analyse a larger sample of cases. Such research can reveal more strategies used by the bribe-givers. It can also provide further insights into whether, for example, cash bribe payments are substitutes for using intermediaries in high-corruption environments.

The social norms-based simulation model presented in this thesis can be further developed to analyse the public officials' decision-making processes. This work can focus on the motivations behind providing unfair advantages, besides monetary interests. Past research presented a number of possible answers to why officials reciprocate with an unfair advantage following the receipt of a bribe. For example, the bribe-givers could engage in hostage taking, threatening the officials' or their families' wellbeing. In such cases, protections can be offered to officials who decide to blow the whistle on a corrupt deal. However, the case studies in this thesis did not suggest that this was the case. Other motivations guided the choices to provide unfair advantages. Future work can explore further explanations of this behaviour, and analyse how the motivations and the choices may differ if a longer period of time lapses between the bribe receipt and the choice of whether to provide an unfair advantage.

This thesis analysed a number of corrupt networks. As coordination of public officials is key to the award of the project to the bribe-giver in the infrastructure sector, further research can focus on the operation of the networks of public officials. Such work can reveal how these networks operate and how they create organised sales of advantages.

Appendix A. Corruption Definitions

1. "the abuse of public office for private gain" (World Bank, 1997)

2. "the abuse of entrusted power for private gain" (Transparency International, 2009)

3. "the abuse of entrusted authority for illicit gain" (Norad) (Disch et al., 2009)

4. "the illicit use of one's position or power for perceived personal or collective gain" (Ashforth et al., 2008)

5. "the abuse of public or private office for private gain" (OECD, 2008)

6. "abuses of public office or entrusted power for private gain" (Kaufmann and Vicente, 2011)

7. "pollution of the public by the private" (Thompson, 2013)

8. "the illegitimate use of public roles and resources for private benefit, where 'private' often refers to large groups such as political parties" (Bicchieri and Duffy, 1997)

9. "Corruption is behavior which deviates from the formal duties of a public role because of private-regarding (personal, close family, private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding influence" (Nye, 1967, p.419)

10. "Corruption is behaviour of public officials which deviates from accepted norms in order to serve private ends." (Huntington, 2002, p. 253)

11. "corruption is the wilful subversion (or attempted subversion) of a due decision-making process with regard to the allocation of any benefit". (Sole, 2005)

12. "the intentional non-compliance with the arm's-length principle aimed at deriving some advantage for oneself or a related individuals from this behaviour" (Tanzi, 1996)

13. "the sale of government property for private gain" (Aidt, 2009)

14. "the sale by government officials of government property for personal gain" (Shleifer and Vishny, 1993)

15. "private exchange between two parties (the 'demander' and the 'supplier') which: (1) has an influence on the allocation of resources either immediately or in the future, and (2) involves the use or abuse of public or collective responsibility for private ends" (Macrae, 1982, p.678)

16. "By definition, *organizational corruption* involves at least two agents, X and Y, where at least Y occupies at least one designated role that is attached to a particular organization. The organizational role obliges Y to follow an established set of ethical rules, at least some of which are consistent with the goals of the organization. X consciously intends an action, which is deliberately designed to cause or persuade Y to breach at least one of these goal-consistent ethical rules, of which X and Y are both aware. With the option of acting otherwise, Y violates this rule in accord with the wishes of X." (Hodgson and Jiang, 2007, p.1053)

17. "corruption is not at bottom simply a matter of law; rather it is fundamentally a matter of morality" (Miller, 2005)

18. Institutional corruption: "note that an infringement of a specific law or institutional rule does not in and of itself constitute an act of institutional corruption. In order to do so, any such infringement needs to tend to have an institutional effect, eg to defeat the institutional purpose of the rule, to subvert the institutional process governed by the rule, or to contribute to the despoiling of the moral character of a role occupant qua role occupant." (Miller, 2014)

19. "breaches of legal, moral, or social norms" (Misangyi et al., 2008)

Appendix B. Simplifications of equations in Chapter 5

B1. Re-arranging and simplifying equation E5.4.3:

$$\pi_b = P(A) * \big((P(S) + \beta) * C - B\big) + \big(1 - P(A)\big) * (P(S)C - B) \qquad \text{(E5.4.3)}$$

$$P(A) * \big((P(S) + \beta) * C - B\big) + \big(1 - P(A)\big) * (P(S)C - B) \geq 0$$

$$P(A) * \big((P(S) + \beta) * C - B\big) \geq -\big(1 - P(A)\big) * (P(S)C - B)$$

$$P(A) * (P(S)C + \beta C - B) \geq -(P(S)C - B - P(A)P(S)C + P(A)B)$$

$$P(A)P(S)C + P(A)\beta C - P(A)B \geq -P(S)C + B + P(A)P(S)C - P(A)B$$

Cancelling $P(A)P(S)C - P(A)B$ from both sides,

$$P(A)\beta C \geq B - P(S)C$$

$$P(A)\beta C \geq C\left(\frac{B}{C} - P(S)\right)$$

$$P(A)\beta \geq \frac{B}{C} - P(S)$$

$$\beta \geq \frac{B/C - P(S)}{P(A)} \qquad \text{(E5.4.4)}$$

B2. Re-arranging and simplifying equation E5.4.12:

$$\big(1 - P(R)\big) * ((P(S) + \beta) * C - B) + P(R)P(S)C \geq 0 \qquad \text{(E5.4.12)}$$

$$\big(1 - P(R)\big) * ((P(S)C + \beta C) - B) + P(R)P(S)C \geq 0$$

$$P(S)C + \beta C - B - P(R)P(S)C - P(R)\beta C + P(R)B + P(R)P(S)C \geq 0$$

$$P(S)C + \beta C - B - P(R)\beta C + P(R)B \geq 0$$

$$\beta C\big(1 - P(R)\big) - B\big(1 - P(R)\big) + P(S)C \geq 0$$

$$(\beta C - B)\big(1 - P(R)\big) + P(S)C \geq 0$$

$$(\beta C - B)\big(1 - P(R)\big) \geq -P(S)C$$

$$\beta C - B \geq \frac{-P(S)C}{1 - P(R)}$$

$$\beta C \geq \frac{-P(S)C}{1 - P(R)} + B$$

$$\beta \geq \frac{\frac{-P(S)C}{1 - P(R)} + B}{C}$$

$$\beta \geq \frac{-P(S)}{1 - P(R)} + \frac{B}{C}$$

$$\beta \geq \frac{B}{C} - \frac{P(S)}{1-P(R)} \tag{E5.4.13}$$

B3. Re-arranging and simplifying equation E5.4.19:

$$\pi_b = P(R)P(S)C + \big(1 - P(R)\big) * (P(A)P(S)C + P(A)\beta C - P(A)B) + \big(1 - P(R)\big) * (P(S)C - B - P(A)P(S)C + P(A)B) \tag{E5.4.19}$$

$$\begin{aligned}\pi_b = P(R)P(S)C + \big(1 - P(R)\big) \\ * (P(A)P(S)C + P(A)\beta C - P(A)B + P(S)C - B - P(A)P(S)C \\ + P(A)B)\end{aligned}$$

$$\pi_b = P(R)P(S)C + \big(1 - P(R)\big) * (P(A)\beta C + P(S)C - B)$$

231

$$\pi_b = P(R)P(S)C + P(A)\beta C + P(S)C - B - P(R)P(A)\beta C - P(R)P(S)C$$
$$+ P(R)B$$

$$\pi_b = P(A)\beta C + P(S)C - B - P(R)P(A)\beta C + P(R)B$$

$$\pi_b = P(A)\beta C * \big(1 - P(R)\big) - B\big(1 - P(R)\big) + P(S)C$$

$$\pi_b = (P(A)\beta C - B) * \big(1 - P(R)\big) + P(S)C \tag{E5.4.20}$$

B4. Re-arranging equation E5.4.23 to make β the subject:

$$(P(A_b)\beta C - B)(1 - P(R_b)) + P(S)C \geq 0 \tag{E5.4.23}$$

$$(P(A_b)\beta C - B)\big(1 - P(R_b)\big) \geq -P(S)C$$

$$P(A_b)\beta C - B \geq \frac{-P(S)C}{\big(1 - P(R_b)\big)}$$

$$P(A_b)\beta C \geq \frac{-P(S)C}{\big(1 - P(R_b)\big)} + B$$

$$\beta \geq \frac{\dfrac{-P(S)C}{\big(1 - P(R_b)\big)} + B}{P(A_b)C}$$

$$\beta \geq \frac{\dfrac{-P(S)}{\big(1 - P(R_b)\big)} + \dfrac{B}{C}}{P(A_b)}$$

$$\beta \geq \frac{\dfrac{B}{C} - \dfrac{P(S)}{\big(1 - P(R_b)\big)}}{P(A_b)}$$

Appendix C. Model 2 Matlab scripts

Simple model simulation

```
a=8.6;
b=0.01;
c=4.5;
d=0.01;
g=4.5;
h=8.6;
for i=1:1000,
p1(i)=rand;
p2(i)=rand;
p3(i)=rand;
p4(i)=rand;
    w1(i)=1-(2+exp(-a*p1(i)+5)).^(-1)*2;
    w2(i)=(log(p2(i)+b)/c +1);
    w3(i)=(log(p3(i)+d)/g +1);
    w4(i)=(((2+exp(-h*p4(i)+5)).^(-1)))*2;
 pays1(i)=w1(i)-w2(i);
 pays2simple(i)=-w1(i)+w2(i);
 if pays1(i)>=pays2simple(i)
    reject(i)=1;
 elseif pays2simple(i)>=pays1(i)
    reject(i)=0;
 end
end
sum(reject)
p1reject=p1.*reject;
p2reject=p2.*reject;
p1reject(p1reject==0)=nan;
p1acc=p1.*(1-reject);
p2acc=p2.*(1-reject);
p1acc(p1acc==0)=nan;
scatter(p1acc, p2acc, '*', 'b');
hold on
scatter(p1reject, p2reject, 'o', 'r')
xlabel('Proportion of DMs accepting bribes, p1');
ylabel('Size of bribe, p2');
hold on
p1ind=0:0.01:1;
p2ind=exp(-(2+exp(-a*p1ind+5)).^(-1)*2*c)-b;
plot (p1ind, p2ind, 'color', 'b');
legend('Bribe Accepted', 'Bribe Rejected', 'MAB')
set(gca,'FontSize',15)
```

Second Simulation script

```
a=8.6;
b=0.01;
c=4.5;
d=0.01;
```

```matlab
g=4.5;
h=8.6;
for i=1:1000,
p1(i)=rand;
p2(i)=rand;
p3(i)=rand;
p4(i)=rand;
  w1(i)=1-(2+exp(-a*p1(i)+5)).^(-1)*2;
    w2(i)=(log(p2(i)+b)/c +1);
    w3(i)=(log(p3(i)+d)/g +1);
    w4(i)=(((2+exp(-h*p4(i)+5)).^(-1)))*2;
pays1(i)=w1(i)-w2(i);
 pays2(i)=-w1(i)+w2(i)+w3(i)-w4(i);
 pays3(i)=-w1(i)+w2(i)-w3(i)+w4(i);
if pays1(i)>=pays2(i)
        reject(i)=1;
      advantage(i)=0;
elseif pays2(i)>=pays3(i)
     reject(i)=0;
     advantage(i)=1;
 elseif pays3(i)>=pays2(i)
     reject(i)=0;
     advantage(i)=0;
end

end

sum(reject)
sum(advantage)
  p1reject=p1.*reject;
     p2reject=p2.*reject;
   p1reject(p1reject==0)=nan;
    scatter(p1reject,p2reject, 'o', 'r');
    xlabel('Proportion of DMs accepting bribes, p1');
ylabel('Size of bribe, p2');
 hold on
 p1acc=p1.*(1-reject);
 p2acc=p2.*(1-reject);
 p1acc(p1acc==0)=nan;
 p1accadv=p1acc.*advantage;
p2accadv=p2acc.*advantage;
p1accadv(p1accadv==0)=nan;
scatter(p1accadv,p2accadv, '*', 'b')
hold on
p1accna=p1acc.*(1-advantage);
p2accna=p2acc.*(1-advantage);
p1accna(p1accna==0)=nan;
scatter(p1accna, p2accna, 'x', 'g')
hold on
p1=0:0.01:1;
p3=1;
p4=0;
p2=exp(((((1-(2+exp(-a*p1+5)).^(-1)*2)-(log(p3+d)/g
+1)*0.5+(((2+exp(-h*p4+5)).^(-1))))-1)*c)-b;
hold on
plot(p1,p2, 'color', 'b');
```

```matlab
ylim([0 1]);
xlim([0 1]);

legend('Bribe Rejected', 'Bribe Accepted, Advantage Provided',
'Bribe Accepted, No Advantage', 'MAB', 'Location', 'bestoutside')
set(gca,'FontSize',15)
hold on
```

Appendix D. Case studies selection

Number	Case	Sector	Corruption case summary	Selected Y/N
			2014	
1	US v. Alstom S.A., et al	Power, grid, transportation	Multiple cases related to design, construction and provision of services related to power generation facilities, power grids and rail transportation in countries including Indonesia, Saudi Arabia, Egypt and the Bahamas.	Y
2	US v. Avon Products, Inc.	Cosmetics	Provided gifts and bribes to Chinese officials to obtain a direct selling license	N
3	US v. Avon Products (China) Co. Ltd.	Cosmetics	Provided gifts and bribes to Chinese officials to obtain a direct selling license	N
4	US v. Dallas Airmotive	Aircraft maintenance	Provided gifts and bribes to officials in Brazil, Argentina and Peru to obtain aircraft maintenance work	N
5	Bio-Rad Laboratories, Inc.	Medical diagnostics	Payments of bribes to officials in Russia in sales of diagnostic and laboratory equipment	N

	(non-prosecution agreement)	and life sciences		
6	US v. Benito Chinea	Finance	Payment of bribes to an official in Venezuela's state economic development bank to direct financial trading business to a Wall Street broker-dealer	N
7	US v. Joseph Demeneses	Finance	Payment of bribes to an official in Venezuela's state economic development bank to direct financial trading business to a Wall Street broker-dealer	N
8	US v. Hewlett-Packard Polska, SP. Z O.O.	Computer sales	Bribes and gifts to Polish government officials to obtain contracts with Poland's national police agency	N
9	US v. ZAO Hewlett-Packard A.O.	Computer sales	Bribing Russian government officials to secure a hardware and software contract with the federal prosecutor's office	N
10	Hewlett-Packard Mexico, S. de R.L. de C.V. (non-prosecution agreement)	Computer sales	Bribes to a Mexican government official to obtain IT contracts with Mexico's state-owned petroleum company	N

11	US v. Dmitri Firtash	Mining	Racketeering conspiracy to bribe state and central government officials in India to allow mining of titanium minerals	N
12	US v. Suren Gevorgyan	Mining	Racketeering conspiracy to bribe state and central government officials in India to allow mining of titanium minerals	N
13	US v. Andras Knopp	Mining	Racketeering conspiracy to bribe state and central government officials in India to allow mining of titanium minerals	N
14	US v. Gajendra Lal	Mining	Racketeering conspiracy to bribe state and central government officials in India to allow mining of titanium minerals	N
15	US v. Periasamy Sunderalingam	Mining	Racketeering conspiracy to bribe state and central government officials in India to allow mining of titanium minerals	N
16	US v. Marubeni Corporation	Power generation	Related to case 1, US v. Alstom S.A., et al. Payment of bribes to Indonesian government officials to secure a power generation project	Y

17	US v. Asem M. Elgawhary	Power generation	Related to case 1, US v. Alstom S.A., et al. Vice president of Bechtel Corp – engineering, construction and project management. Overseeing competitive bidding process and selecting companies to perform subcontracting work. Laundered the proceeds of a fraudulent scheme	Y
18	US v. Alcoa World Alumina LLC	Mining	Kickback payments to officials in Bahrain to secure contracts to supply raw materials to a state-controlled aluminium smelter	N
19	US v. Joseph Sigelman	Oil	Bribes to Colombia's official to secure oil services contract with state-owned oil company	N
20	US v. Gregory Weisman	Oil	Bribes to Colombia's official to secure oil services contract with state-owned oil company	N
21	US v. Knut Hammarskjold	Oil	Bribes to Colombia's official to secure oil services contract with state-owned oil company	N
2013				
22	Archer Daniels Midland Company	VAT fraud	Bribes to Ukrainian government to obtain VAT refunds	N

	(non-prosecution agreement)			
23	US v. Alfred C. Toepfer International (Ukraine) Ltd	VAT fraud	Bribes to Ukrainian government to obtain VAT refunds	N
24	US v. Bilfinger SE	Gas	Bribe payments to Nigerian officials to obtain a project to build a natural gas pipeline	Y
25	US v. Weatherford International Ltd	Oil	Bribe payments to government officials in several countries, including payments to Iraqi Ministry of Oil in exchange for a contract to provide oil drilling and refining equipment	N
26	US v. Weatherford Services, Ltd	Oil	Bribe payments to Angolan officials to establish oil well screen manufacturing operations	N
27	US v. Diebold, Inc.	ATM	Bribe payments to government officials in China and Indonesia to provide ATMs to state-owned and private banks	N

28	US v. Alain Riedo	Manufacturing	Corrupt payments to Chinese officials to sell high-voltage/high-tension capacitors to Chinese government-controlled companies at a marked up price	N
29	US v. Lawrence Hoskins	Power, grid, transportation	Related case 1, US v. Alstom S.A., et al. Payment of bribes to Indonesian government officials to secure a power generation project	Y
30	US v. Ernesto Lujan	Finance	Payment of bribes to an official in Venezuela's state economic development bank to direct financial trading business to a Wall Street broker-dealer	N
31	US v. Total, S.A.	Oil	Corrupt payments to Iranian government officials to obtain oil and gas concessions	N
32	US v. Maria de los Angeles Gonzales de Hernandez	Finance	Payment of bribes to an official in Venezuela's state economic development bank to direct financial trading business to a Wall Street broker-dealer	N
33	US v. Jose Alejandro Hurtado	Finance	Payment of bribes to an official in Venezuela's state economic development bank to direct financial trading business to a Wall Street broker-dealer	N

34	US v. Tomas Alberto Clarke Bethancourt	Finance	Payment of bribes to an official in Venezuela's state economic development bank to direct financial trading business to a Wall Street broker-dealer	N
35	US v. William Pomponi	Power, grid, transportation	Related to case 1, US v. Alstom S.A., et al. Payment of bribes to Indonesian government officials to secure a power generation project	Y
36	Ralph Lauren Corporation (Non-prosecution agreement)	Clothing	Corrupt payments to Argentinian government officials to obtain customs clearance of merchandise	N
37	US v. Frederic Pierucci	Power, grid, transportation	Related to case 1, US v. Alstom S.A., et al. Payment of bribes to Indonesian government officials to secure a power generation project	Y
38	US v. David Rothschild	Power, grid, transportation	Related to case 1, US v. Alstom S.A., et al. Payment of bribes to Indonesian government officials to secure a power generation project	Y
39	US v. Parker Drilling Company	Drilling rigs, import duties	Corrupt payments to influence the decisions of a Nigerian government panel reviewing the company's adherence to Nigerian customs and tax laws	N

40	US v. Frederic Cilins	Mining	A mining company paid bribes to win lucrative mining rights in the Republic of Guinea.	N
41	US v. Peter Dubois	Aircraft maintenance	Executives of Lufthansa subsidiary Bizjet paid bribes to Latin American government officials to secure aircraft maintenance, repair and overhaul services	N
42	US v. Jald Jensen	Aircraft maintenance	Executives of Lufthansa subsidiary Bizjet paid bribes to Latin American government officials to secure aircraft maintenance, repair and overhaul services	N
43	US v. Bernd Kowalewski	Aircraft maintenance	Executives of Lufthansa subsidiary Bizjet paid bribes to Latin American government officials to secure aircraft maintenance, repair and overhaul services	N
44	US v. Neal Uhl	Aircraft maintenance	Executives of Lufthansa subsidiary Bizjet paid bribes to Latin American government officials to secure aircraft maintenance, repair and overhaul services	N

Bibliography

ABBINK, K. 2000. Fair salaries and the moral costs of corruption. Bonn Econ Discussion Papers.

ABBINK, K. 2004. Staff rotation as an anti-corruption policy: an experimental study. *European Journal of Political Economy,* 20**,** 887-906.

ABBINK, K., IRLENBUSCH, B. & RENNER, E. 2000. The moonlighting game: An experimental study on reciprocity and retribution. *Journal of Economic Behavior & Organization,* 42**,** 265-277.

ABBINK, K., IRLENBUSCH, B. & RENNER, E. 2002. An Experimental Bribery Game. *Journal of Law, Economics, and Organization,* 18**,** 428-454.

ADES, A. & DI TELLA, R. 1999. Rents, competition, and corruption. *American economic review,* 89**,** 982-993.

AIDT, T. S. 2003. Economic analysis of corruption: a survey*. *The Economic Journal,* 113**,** F632-F652.

AIDT, T. S. 2009. Corruption, institutions, and economic development. *Oxford Review of Economic Policy,* 25**,** 271-291.

AKERLOF, G. A. & DICKENS, W. T. 1982. The Economic Consequences of Cognitive Dissonance. *The American Economic Review,* 72**,** 307-319.

ALEXANDER, D. 2005. The Italian mafia's legacy of high-rise death traps.

ANTONY SEELY, F. M. 2017. The Paradise Papers. Briefing Paper. *House of Commons Library.* www.parliament.uk/commons-library.

ARGANDOÑA, A. 2003. Private-to-private Corruption. *Journal of Business Ethics,* 47**,** 253-267.

ASHFORTH, B. E., GIOIA, D. A., ROBINSON, S. L. & TREVIÑO, L. K. 2008. Re-viewing organizational corruption. *Academy of Management Review,* 33**,** 670-684.

BANERJEE, A., MULLAINATHAN, S. & HANNA, R. 2012. Corruption. *National Bureau of Economic Research Working Paper Series,* No. 17968.

BANURI, S. & ECKEL, C. 2012. The effects of sanctions on Bribery: US versus Pakistan. CBEES Working Paper Series 09-01.

BARDHAN, P. & MOOKHERJEE, D. 2006. Decentralization, corruption and government accountability. *International handbook on the economics of corruption,* 6**,** 161-188.

BARR, A. & SERRA, D. 2009. The effects of externalities and framing on bribery in a petty corruption experiment. *Experimental Economics,* 12**,** 488-503.

BARR, A. & SERRA, D. 2010. Corruption and culture: An experimental analysis. *Journal of Public Economics,* 94**,** 862-869.

BAYAR, G. 2005. The role of intermediaries in corruption. *Public Choice,* 122**,** 277-298.

BAYAR, G. 2009. Corruption and intermediaries-A game theoretical approach. *METU Studies in Development,* 36**,** 25-49.

BECK, P. J. & MAHER, M. W. 1986. A comparison of bribery and bidding in thin markets. *Economics Letters,* 20**,** 1-5.

BEGOVIC, B. 2005. Corruption: concepts, types, causes and consequences. *Center for Liberal-Democratic Studies, Year III No,* 26.

BICCHIERI, C. 2006. *The grammar of society: The nature and dynamics of social norms*, Cambridge University Press.

BICCHIERI, C. & DUFFY, J. 1997. Corruption Cycles. *Political Studies,* 45**,** 477-495.

BLISS, C. & DI TELLA, R. 1997. Does Competition Kill Corruption? *Journal of Political Economy,* 105**,** 1001-1023.

BLOMQUIST, W. & DELEON, P. 2011. The Design and Promise of the Institutional Analysis and Development Framework. *Policy Studies Journal,* 39**,** 1-6.

BOEHM, F. 2009. Anti-corruption in regulation-a safeguard for infrastructure reforms. *Competition & Reg. Network Indus.,* 10**,** 45.

BOEHM, F. & LAMBSDORFF, J. 2009. A New Institutional Economics Perspective on Corruption and Anti-Corruption. *Revista de Economía Institucional,* 11.

BORGATTI, S. P., EVERETT, M. G. & JOHNSON, J. C. 2013. *Analyzing social networks*, SAGE Publications Limited.

BRANDT, U. S. & SVENDSEN, G. T. 2013. Why does bureaucratic corruption occur in the EU? *Public Choice,* 157**,** 585-599.

BRAVO, G., SQUAZZONI, F. & TAKÁCS, K. 2012. Intermediaries in trust: An experimental study on incentives and norms. *Collegio Carlo Alberto Notebooks*.

BUHR, W. 2003. What is infrastructure? : Universität Siegen, Fakultät Wirtschaftswissenschaften, Wirtschaftsinformatik und Wirtschaftsrecht.

BURGESS, R., HANSEN, M., OLKEN, B. A., POTAPOV, P. & SIEBER, S. 2012. The Political Economy of Deforestation in the Tropics*. *The Quarterly Journal of Economics,* 127**,** 1707-1754.

BUSKENS, V. 1998. The social structure of trust. *Social Networks,* 20**,** 265-289.

BUSKENS, V. 2003. Trust in triads: effects of exit, control, and learning. *Games and Economic Behavior,* 42**,** 235-252.

BUSKENS, V., RAUB, W. & VAN DER VEER, J. 2010. Trust in triads: An experimental study. *Social Networks,* 32**,** 301-312.

CADOT, O. 1987. Corruption as a gamble. *Journal of Public Economics,* 33**,** 223-244.

CAMERER, C. 2003. *Behavioral game theory: Experiments in strategic interaction*, Princeton University Press.

CARTIER–BRESSON, J. 1997. Corruption Networks, Transaction Security and Illegal Social Exchange. *Political Studies,* 45**,** 463-476.

CARVAJAL, R. 1999. Large-Scale Corruption: Definition, Causes, and Cures. *Systemic Practice and Action Research,* 12**,** 335-353.

CHAYES, S. 2015. *Thieves of state: Why corruption threatens global security*, WW Norton & Company.

CHUGH, D. 2012. Psychology of Corruption. *Journal: The Learning Curve, Lady Shri Ram College for Women Finalist, Young Psychologist*.

COLEMAN, J. S. & FARARO, T. J. 1992. *Rational choice theory: advocacy and critique,* Newbury Park, London, New Delhi, Sage Publications.

COLLIER, M. W. 2002. Explaining corruption: An institutional choice approach. *Crime, Law and Social Change,* 38**,** 1-32.

DE GRAAF, G. 2007. CAUSES OF CORRUPTION: TOWARDS A CONTEXTUAL THEORY OF CORRUPTION. *Public Administration Quarterly,* 31**,** 39-86.

DFID 2015. Why corruption matters: understanding causes, effects and how to address them. Department for International Development.

DISCH, A., VIGELAND, E. & SUNDET, G. 2009. Anti-Corruption Approaches A Literature Review. Norwegian Agency for Development Cooperation (Norad).

DOSS, C. R. & MEINZEN-DICK, R. 2015. Collective Action within the Household: Insights from Natural Resource Management. *World Development,* 74**,** 171-183.

DRUGOV, M., HAMMAN, J. & SERRA, D. 2014. Intermediaries in corruption: an experiment. *Experimental Economics,* 17**,** 78-99.

ELSTER, J. 2007. *Explaining social behavior: More nuts and bolts for the social sciences*, Cambridge University Press.

EMERSON, P. M. 2006. Corruption, competition and democracy. *Journal of Development Economics,* 81**,** 193-212.

FEHR, E. & FALK, A. 2002. Psychological foundations of incentives. *European Economic Review,* 46**,** 687-724.

FEIOCK, R. C., WEIBLE, C. M., CARTER, D. P., CURLEY, C., DESLATTE, A. & HEIKKILA, T. 2016. Capturing Structural and Functional Diversity Through Institutional Analysis: The Mayor Position in City Charters. *Urban Affairs Review,* 52**,** 129-150.

FERRAZ, C. & FINAN, F. 2011. Electoral Accountability and Corruption: Evidence from the Audits of Local Governments. *American Economic Review,* 101**,** 1274-1311.

FERRIANI, S., FONTI, F. & CORRADO, R. 2013. The social and economic bases of network multiplexity: Exploring the emergence of multiplex ties. *Strategic Organization,* 11**,** 7-34.

FJELDSTAD, O.-H. 2003. Fighting fiscal corruption: lessons from the Tanzania Revenue Authority. *Public Administration and Development,* 23**,** 165-175.

FREY, B. S. & JEGEN, R. 2001. Motivation Crowding Theory. *Journal of Economic Surveys,* 15**,** 589-611.

GARDINER, J. 2007. Defining Corruption. *In:* HEIDENHEIMER, A. J. & JOHNSON, M. (eds.) *Political Corruption: Concepts and Contexts.* 3rd ed. New Brunswick (U.S.A) and London (U.K.): Transaction Publishers.

GIACC 2008. Examples of Corruption in Infrastructure. Global Infrastructure Anti-Corruption Centre.

GILBERT, N. & TROITZSCH, K. G. 2005. *Simulation for the social scientist,* Maidenhead [etc.], Open University Press.

GONZALEZ, L. G., GUTH, W. & LEVATI, M. V. 2007. Speeding up Bureaucrats by Greasing Them: An Experimental Study. *Homo Oeconomicus,* 24**,** 5-20.

GRAEFF, P. & MEHLKOP, G. 2003. The impact of economic freedom on corruption: different patterns for rich and poor countries. *European Journal of Political Economy,* 19**,** 605-620.

GREEN, P. 2005. Disaster by Design: Corruption, Construction and Catastrophe. *British Journal of Criminology,* 45**,** 528-546.

GROENENDIJK, N. 1997. A principal-agent model of corruption. *Crime, Law and Social Change,* 27**,** 207-229.

GUPTA, S., DAVOODI, H. & ALONSO-TERME, R. 2002. Does corruption affect income inequality and poverty? *Economics of Governance,* 3**,** 23-45.

HASKER, K. & OKTEN, C. 2008. Intermediaries and corruption. *Journal of Economic Behavior & Organization,* 67**,** 103-115.

HAWKINS, J. 2013. How to Note: Reducing corruption in infrastructure sectors. UK: Evidence on Demand.

HEDSTRÖM, P. 2005. *Dissecting the social: On the principles of analytical sociology*, Cambridge University Press Cambridge.

HEIDENHEIMER, A. J. 1970. The Context of Analysis. *In:* HEIDENHEIMER, A. J. (ed.) *Political Corruption: Readings in Comparative Analysis.* New York: Holt, Rinehart and Winston.

HEIKKILA, T., SCHLAGER, E. & DAVIS, M. W. 2011. The Role of Cross-Scale Institutional Linkages in Common Pool Resource Management: Assessing Interstate River Compacts*. *Policy Studies Journal,* 39**,** 121-145.

HELLMAN, J. S., JONES, G. & KAUFMANN, D. 2003. Seize the state, seize the day: state capture and influence in transition economies. *Journal of Comparative Economics,* 31**,** 751-773.

HENSCHEL, P. 2016. Extraterritorial application of US and UK/EU law - A threat also for Swiss companies? *Lexology.* https://www.lexology.com/library/detail.aspx?g=cf9c9c35-42d8-4822-b41a-844b3038bdb1.

HEPKEMA, S. 1997. Bribery of Public Officials: an IBA Survey. *Int'l Bus. Law.,* 25**,** 415.

HIJDRA, A., WOLTJER, J. & ARTS, J. 2015. Troubled waters: An institutional analysis of ageing Dutch and American waterway infrastructure. *Transport Policy,* 42**,** 64-74.

HM TREASURY, N. I. C. 2017. National Infrastructure Commission framework document www.gov.uk/government/publications: HM Treasury and National Infrastructure Commission.

HODGSON, G. M. & JIANG, S. 2007. The economics of corruption and the corruption of economics: an institutionalist perspective. *Journal of Economic Issues*, 1043-1061.

HOPKIN, J. 2002. States, markets and corruption: a review of some recent literature. *Review of International Political Economy,* 9**,** 574-590.

HUNTINGTON, S. P. 2002. Modernization and corruption. *Political corruption: Concepts and contexts*, 253-63.

HUNTINGTON, S. P. 2006. *Political order in changing societies*, Yale University Press.

INDEPENDENT INQUIRY COMMITTEE INTO THE UNITED NATIONS OIL-FOR-FOOD PROGRAMME 2005. Manipulation of the Oil-For-Food Programme by the Iraqi Regime. https://web.archive.org/web/20130823070841/http://www.iic-offp.org/documents/IIC%20Final%20Report%2027Oct2005.pdf.

JABER-LÓPEZ, T., GARCÍA-GALLEGO, A., PERAKAKIS, P. & GEORGANTZIS, N. 2014. Physiological and behavioral patterns of corruption. *Frontiers in Behavioral Neuroscience,* 8**,** 434.

JAIN, A. K. 1998a. Corruption: An Introduction. *In:* JAIN, A. (ed.) *Economics of Corruption.* Springer US.

JAIN, A. K. 1998b. Corruption: Quantitative Estimates. *Economics of Corruption.* Springer.

JAIN, A. K. 1998c. Models of Corruption. *In:* JAIN, A. (ed.) *Economics of Corruption.* Springer US.

JOCHIMSEN, R. 1966. *Theorie der Infrastrucktur: Grundlagen der marktwirtschaftlichen Entwicklung*, Mohr Siebeck.

JUDGE, W. Q., MCNATT, D. B. & XU, W. 2011. The antecedents and effects of national corruption: A meta-analysis. *Journal of World Business,* 46**,** 93-103.

KAUFMANN, D. 1998. Research on Corruption: Critical Empirical Issues. *In:* JAIN, A. K. (ed.) *Economics of Corruption.* Boston, MA: Springer US.

KAUFMANN, D. & KALIBERDA, A. 1996. Integrating the unofficial economy into the dynamics of post-socialist economies: A framework of analysis and evidence. *World Bank Policy Research Working Paper*.

KAUFMANN, D. & VICENTE, P. C. 2011. LEGAL CORRUPTION. *Economics & Politics,* 23**,** 195-219.

KENNY, C. 2006. Measuring and Reducing the Impact of Corruption in Infrastructure. *The World Bank,* Policy Research Working Paper 4099.

KLEINROCK, L. 1967. Optimum Bribing for Queue Position. *Operations Research,* 15**,** 304-318.

KLITGAARD, R. 1988. *Controlling Corruption,* Berkeley, University of California Press.

KURAN, T. 1998. Moral overload and its alleviation. *Economics, Values, and Organization*, 231-266.

KURER, O. 2005. Corruption: An alternative approach to its definition and measurement. *Political Studies,* 53**,** 222-239.

LAFFONT, J.-J. & TIROLE, J. 1991. The Politics of Government Decision-Making: A Theory of Regulatory Capture. *The Quarterly Journal of Economics,* 106**,** 1089-1127.

LAMBERT-MOGILIANSKY, A. & SONIN, K. 2006. Collusive Market Sharing and Corruption in Procurement. *Journal of Economics & Management Strategy,* 15**,** 883-908.

LAMBSDORFF, J. G. 2002. Making corrupt deals: contracting in the shadow of the law. *Journal of Economic Behavior & Organization,* 48**,** 221-241.

LAMBSDORFF, J. G. & FRANK, B. 2010. Bribing versus gift-giving – An experiment. *Journal of Economic Psychology,* 31**,** 347-357.

LAMBSDORFF, J. G. & FRANK, B. 2011. Corrupt reciprocity–Experimental evidence on a men's game. *International Review of Law and Economics,* 31**,** 116-125.

LANGE, D. 2008. A Multidimensional Conceptualization of Organizational Corruption Control. *Academy of Management Review,* 33**,** 710-729.

LEE, J. J. & PINKER, S. 2010. Rationales for indirect speech: the theory of the strategic speaker. *Psychological review,* 117**,** 785.

LEFF, N. H. 1964. Economic development through bureaucratic corruption. *American behavioral scientist,* 8**,** 8-14.

LEVI, M., DAKOLIAS, M. & GREENBERG, T. S. 2007. Money laundering and corruption. *The Many Faces of Corruption***,** 389.

LICHT, A. N., GOLDSCHMIDT, C. & SCHWARTZ, S. H. 2007. Culture rules: The foundations of the rule of law and other norms of governance. *Journal of comparative economics,* 35**,** 659-688.

LIEN, D.-H. D. 1986. A note on competitive bribery games. *Economics Letters,* 22**,** 337-341.

LUI, F. T. 1985. An Equilibrium Queuing Model of Bribery. *Journal of Political Economy,* 93**,** 760-781.

LUI, F. T. 1986. A dynamic model of corruption deterrence. *Journal of public Economics,* 31**,** 215-236.

MACRAE, J. 1982. Underdevelopment and the economics of corruption: A game theory approach. *World Development,* 10**,** 677-687.

MALEC, K. L. 1993. Public attitudes toward corruption: twenty-five years of research. *Ethics and public administration***,** 13-27.

MANDAL, B. & MARJIT, S. 2010. Corruption and wage inequality? *International Review of Economics & Finance,* 19**,** 166-172.

MARQUETTE, H. & PEIFFER, C. 2015. Corruption and Collective Action. University of Birmingham, UK: The Development Leadership Program.

MATTOR, K. M. & CHENG, A. S. 2015. Contextual Factors Influencing Collaboration Levels and Outcomes in National Forest Stewardship Contracting. *Review of Policy Research,* 32**,** 723-744.

MAURO, P. 1995. Corruption and Growth. *The Quarterly Journal of Economics,* 110**,** 681-712.

MAURO, P. 1998. Corruption and the composition of government expenditure. *Journal of Public Economics,* 69**,** 263-279.

MCGINNIS, M. D. 2011. An Introduction to IAD and the Language of the Ostrom Workshop: A Simple Guide to a Complex Framework. *Policy Studies Journal,* 39**,** 169-183.

MÉON, P.-G. & SEKKAT, K. 2005. Does corruption grease or sand the wheels of growth? *Public Choice,* 122**,** 69-97.

MÉON, P.-G. & WEILL, L. 2010. Is Corruption an Efficient Grease? *World Development,* 38**,** 244-259.

MILLER, S. 2005. Corruption. *The Stanford Encyclopedia of Philosophy* [Online].

MILLER, S. 2014. The corruption of financial benchmarks: financial markets, collective goods and institutional purposes. *Law and Financial Markets Review,* 8**,** 155-164.

MISANGYI, V. F., WEAVER, G. R. & ELMS, H. 2008. Ending corruption: the interplay among institutional logics, resources, and institutional entrepreneurs. *Academy of Management Review,* 33**,** 750-770.

MISHRA, A. 2006. Persistence of corruption: some theoretical perspectives. *World Development,* 34**,** 349-358.

MULAZZANI, L., CURTIN, R., ANDRÉS, M. & MALORGIO, G. 2013. Multilevel governance and management of shared stocks with integrated markets: The European anchovy case. *Marine Policy,* 38**,** 407-416.

NELL, M. 2007. Strategic aspects of voluntary disclosure programs for corruption offences: Towards a design of good practice. Passauer Diskussionspapiere: Volkswirtschaftliche Reihe.

NIEHAUS, P. & SUKHTANKAR, S. 2013. Corruption Dynamics: The Golden Goose Effect. *American Economic Journal: Economic Policy,* 5**,** 230-69.

NIJKAMP, P. 2000. Infrastructure and suprastructure in regional competition: A deus ex machina? *Regional competition.* Springer.

NYE, J. S. 1967. Corruption and Political Development: A Cost-Benefit Analysis. *The American Political Science Review,* 61**,** 417-427.

O'DONOVAN, J., WAGNER, H. F. & ZEUME, S. 2018. The value of offshore secrets–Evidence from the Panama Papers. *Available at SSRN 2771095*.

OECD 2008. Corruption. A glossary of international standards in criminal law. *OECD Glossaries.* Paris, France: OECD Publishing.

OECD 2010. Good Practice Guidance on Internal Controls, Ethics, and Compliance. *In:* DEVELOPMENT, O. F. E. C.-O. A. (ed.). http://www.oecd.org/daf/anti-bribery/44884389.pdf.

OECD 2011a. Convention on Combaring Bribery of Foreign Public Officials in International Business Transactions. http://www.oecd.org/daf/anti-bribery/ConvCombatBribery_ENG.pdf: Organisation for Economic Co-operation and Development.

OECD 2011b. Update on tax legislation on the tax treatment of bribes to foreign public officials in countries parties to the OECD anti bribery convention.

OECD 2017. OECD Recommendations of the Council on Public Integrity. http://www.oecd.org/gov/ethics/OECD-Recommendation-Public-Integrity.pdf.

OLDENBURG, P. 1987. Middlemen in Third-World Corruption: Implications of an Indian Case. *World Politics,* 39**,** 508-535.

OLKEN, B. A. 2007. Monitoring corruption: evidence from a field experiment in Indonesia. *J. Polit. Econ.,* 115**,** 200-49.

OLKEN, B. A. 2009. Corruption perceptions vs. corruption reality. *Journal of Public Economics,* 93**,** 950-964.

OLSON, R. S., OLSON, R. A. & GAWRONSKI, V. T. 1999. *Some buildings just can't dance: Politics, life safety, and disaster*, Jai Press.

OSBORNE, M. J. 1994. *A course in game theory,* Cambridge, Mass., MIT Press.

OSTROM, E. 2005. *Understanding Institutional Diversity,* UK, Princeton University Press.

OSTROM, E. 2010. Institutional Analysis and Development: Elements of the Framework in Historical Perspective. *In:* CROTHERS, C. (ed.) *Historical Developments and Theoretical Approaches in Sociology.* United Kingdom: Eolss Publishers Co. Ltd.

OSTROM, E. 2011. Background on the Institutional Analysis and Development Framework. *Policy Studies Journal,* 39**,** 7-27.

PARK, H. 2003. Determinants of Corruption: A Cross-National Analysis. *Multinational Business Review,* 11**,** 29-48.

PERSSON, A., ROTHSTEIN, B. & TEORELL, J. 2013. Why Anticorruption Reforms Fail—Systemic Corruption as a Collective Action Problem. *Governance,* 26**,** 449-471.

PINTO, J., LEANA, C. R. & PIL, F. K. 2008. Corrupt Organizations or Organizations of Corrupt Individuals? Two Types of Organization-Level Corruption. *Academy of Management Review,* 33**,** 685-709.

PRUD'HOMME, R. 2004. Infrastructure and Development. *Annual Bank Conference on Development Economics.* Washington, DC.

RASMUSEN, E. & RAMSEYER, J. M. 1994. Cheap bribes and the corruption ban: A coordination game among rational legislators. *Public Choice,* 78**,** 305-327.

RHODES, C. 2015. Infrastructure policy. *In:* PAPER, H. O. C. B. (ed.). www.parliament.uk/commons-library: Commons Library.

ROSE-ACKERMAN, S. 1998. Bribes and gifts. *In:* BEN-NER, A. & PUTTERMAN, L. (eds.) *Economics, values, and organization.* Cambridge, UK: Cambridge University Press.

ROSE-ACKERMAN, S. 1999. *Corruption and government: Causes, consequences, and reform*, Cambridge University Press.

ROSE-ACKERMAN, S. 2006. Introduction and overview. *In:* ROSE-ACKERMAN, S. (ed.) *International Handbook on the Economics of Corruption.* Cheltenham, UK: Edward Elgar.

ROSE-ACKERMAN, S. 2010a. Corruption: Greed, Culture, and the State. *120 Yale L.J. Online* 125.

ROSE-ACKERMAN, S. 2010b. The Law and Economics of Bribery and Extortion. *Annual Review of Law and Social Science,* 6**,** 217-238.

ROSE-ACKERMAN, S. & TRUEX, R. 2012. Corruption and policy reform. *Yale Law & Economics Research Paper*.

SELDADYO, H. & DE HAAN, J. 2005. The determinants of corruption. *The Economist,* 66.

SHLEIFER, A. & VISHNY, R. W. 1993. Corruption. *The Quarterly Journal of Economics,* 108**,** 599-617.

SITUNGKIR, H. 2003. Money-Scape: A generic agent-based model of corruption. *Computational Economics Archive,* 405008.

SOHAIL, M. & CAVILL, S. 2008. Accountability to prevent corruption in construction projects. *Journal of Construction Engineering and management,* 134**,** 729-738.

SOLE, S. 2005. The state of corruption and accountability. *In:* DANIEL, J., SOUTHALL, R. & LUTCHMAN, J. (eds.) *State of the Nation: South Africa 2004-2005.* Cape Town South Africa: HSPC Press.

SØREIDE, T. 2007. 13 Corruption in international business transactions: the perspective of Norwegian firms. *International handbook on the economics of corruption***,** 381.

STANFORD LAW SCHOOL. 2018. *Foreign Corrupt Practices Act Clearinghouse* [Online]. http://fcpa.stanford.edu/index.html. [Accessed 16 May 2018].

STANSBURY, N. 2005. Exposing the foundations of corruption in construction. *In:* RODRIGUEZ, D., WAITE, G. & WOLFE, T. (eds.) *Global Corruption Report.* London: Pluto Press.

TANZI, V. 1996. Corruption: arm's-length relationships and markets. *In:* FIORENTINI, G. & PELTZMAN, S. (eds.) *The Economics of Organized Crime.* Cambridge: Cambridge University Press.

TANZI, V. 1998a. Corruption and the budget: Problems and solutions. *Economics of corruption.* Springer.

TANZI, V. 1998b. Corruption around the world: Causes, consequences, scope, and cures. *Staff Papers-International Monetary Fund***,** 559-594.

TANZI, V. & DAVOODI, H. 1998. Roads to Nowhere: How Corruption in Public Investment Hurts Growth. International Monetary Fund.

THE CHARTERED INSTITUTE OF BUILDING 2013. A report exploring corruption in the UK Construction Industry. UK.

THOMPSON, D. F. 2004. Two Concepts of Corruption: Making Campaigns Safe for Democracy. *Geo. Wash. L. Rev.,* 73**,** 1036.

THOMPSON, D. F. 2013. Two Concepts of Corruption. *Edmond J. Safra Working Papers*.

TRACE INTERNATIONAL, I. 2016. What you should know about individual liability under the Foreign Corrupt Practices Act. www.traceinternational.org: TRACE International Inc.

TRANSPARENCY INTERNATIONAL 2009. The Anti-Corruption Plain Language Guide. Berlin, Germany: Transparency International.

TRANSPARENCY INTERNATIONAL 2011. Bribe Payers Index Report.

TULLOCK, G. 1980. Efficient Rent Seeking. *In:* BUCHANAN, J. M., TOLLISON, R. D. & TULLOCK, G. (eds.) *Toward a Theory of the Rent Seeking Society.* College Station: Texas A&M University Press.

URIBE, C. A. 2012. The Dark Side of Social Capital Re-examined from a Policy Analysis Perspective: Networks of Trust and Corruption. *Journal of Comparative Policy Analysis: Research and Practice,* 16**,** 175-189.

USLANER, E. M. 2010. *Corruption, Inequality, and the Rule of Law. The Bulging Pocket Makes the Easy Life,* Cambridge, Cambridge University Press.

VAN RIJCKEGHEM, C. & WEDER, B. 2001. Bureaucratic corruption and the rate of temptation: do wages in the civil service affect corruption, and by how much? *Journal of Development Economics,* 65**,** 307-331.

VOINEA, C. 2013. Bribery-Scape: An Artificial Society-Based Simulation Model of Corruption's Emergence and Growth. *European Quarterly of Political Attitudes and Mentalities,* 2**,** 27-54.

WARNER, C. M. 2007. *The Best System Money Can Buy: Corruption in the European Union,* Ithaca and London, Cornell University Press.

WARREN, M. E. 2004. What Does Corruption Mean in a Democracy? *American Journal of Political Science,* 48**,** 328-343.

WEF 2013. Strategic Infrastructure: Steps to Prepare and Accelerate Public-Private Partnerships. Cologny/Geneva: World Economic Forum.

WELLS, J. 2015. Corruption in the construction of public infrastructure: Critical Issues in project preparation. *In:* MONTERO, A. G. (ed.) *Anti-corruption in sectors.* Chr. Michelsen Institute.

WILKS-HEEG, S. 2015. Revolving-Door Politics and Corruption. *In:* WHYTE, D. (ed.) *How corrupt is Britain?* Chippenham, UK Pluto Press.

WORLD BANK. 1997. Helping Countries Combat Corruption: The Role of the World Bank. Available: http://www1.worldbank.org/publicsector/anticorrupt/corruptn/corrptn.pdf [Accessed 27/05/2014].

YOUNG, H. P. 2015. The Evolution of Social Norms. *Annual Review of Economics,* 7**,** null.

ZANELLA, M. 2013. 9 Script analysis of corruption in public procurement. *Cognition and Crime: Offender Decision Making and Script Analyses***,** 164.