Corruption and Social Capital
The Case of Vietnam

Nga Nguyen (22457)

Corruption between the principal (public official) and her agent (firm) is examined in a new setting, where the corrupt process is not only an economic game, but also a social one. When formal institutions fail, the provision of public goods and services is often embedded in social relations. The aim of this study is to determine if, and if so how, social capital affects firm's probability of paying informal fees and their bribe-premium. Social capital is in this study defined as membership in the Communist Party of Vietnam and the size of firm's political network. Using a firm-level panel data set of manufacturing SMEs in Vietnam and a law amendment, which generates an obligation to obtain an environmental standards certificate, a Difference-in-Difference estimation approach is used to study the relation of interest. I find that firms with large political networks have higher probability of engaging in corrupt activities, supporting the facilitative quality of social network on corruption. Firms with large political networks also have lower probability of paying informal fees after obtaining the certificate. This result is accompanied with a higher probability of bribing prior to the law amendment, thus, indicating reciprocity within the networks. This pattern is not found when social capital is defined as party-membership or for firms with small networks.

Acknowledgements

Table of Contents

1 Purpose

Corruption, here defined as the abuse of public office for private gain, is an informal collective action that requires facilitating institutions and discretion from the parties involved (Rose-Ackerman 1997; Jain 2001; Maitland 2001). In settings where formal institutions fail, social institutions can facilitate the provision of public services by embedding them in social relationships (Granovetter 1985). The observed heterogeneity of economic performance between highly corrupt countries in East Asia–The East Asian Paradox–has prompted scholars to conclude the attribution to institutional and social features. In East Asian countries where high corruption rates have been accompanied with high levels of growth, the creation of centralized corrupt networks has been one contributing factor in facilitating this growth since it stabilizes corruption and motivates a long-term perspective in political economics (Treisman 2000; Rock and Bonnett 2004; Fisman and Gatti 2006). The Russian folk saying: "Better a hundred friends than a hundred rubles." (Rose 1998, p. 22) aids to illustrate the importance of social relations when getting things done in Russia, and how it can be more valuable than monetary means.

The *New Institutional Economics* and the *New Social Economics* have emerged to incorporate the impact of social structures and sociology on neoclassical theory. These studies use the term social capital to describe the usage of individual social relationships as resources to facilitate certain actions within that social structure (Coleman 1990; Rose 1998; Jain 2001; Lambsdorff, Taube and Schramm 2005). Social capital and corruption have predominately been studied theoretically as a mechanism to reduce uncertainties and opportunistic behaviors in the transactions, less have been explored empirically. Therefore, in order to better understand the prevalence and stabilization of corruption, its impact on current formal institutions, and to design successful anti-corruption programs, comprehension of the motivations behind nepotistic behavior of local government officials and their interactions with individuals from different social groups is important.

Inspired by the facilitative characteristics of social relations on corruption and possible price discriminations in corruption bargaining due to nepotism and subordination, this paper's contributions are twofold. First, it aims contribute to the current literature on social capital and corruption by reducing the empirical gap in the current literature. Second, it aims to explore the heterogeneity in firm-level bribing behavior in a new setting; by using a unique firm-level data set to incorporate social capital when obtaining a business certificate. Therefore, the following research question is posed:

Will a firm's probability of paying informal fees, and the magnitude of these fees, be affected by the firm's social capital?

To answer this question, I will be using a database containing over 2,600 Vietnamese small and medium-sized manufacturing enterprises (SMEs) surveyed in 2005, 2007 and 2009 as part of the CIEM-DANIDA Project. To my knowledge, no previous study has looked at the relation between informal payments and firms' social capital using this data set. I will run two regressions, using proxies of corruption as my dependent variable to test the impact of social capital on firm's probability of paying informal fees and their magnitude. Social capital will be measured by two variables in this study: a variable indicating if the respondent (owner/manager) of the firm is a member of the Communist Party of Vietnam (CPV) and the size of the firm's political network, consisting of politicians and civil workers.

Striving to mitigate empirical issues of omitted variable bias and missing counterfactuals, I will make use of an amendment in the Law on Protection of the Environment (LPE) which ultimately implies that all manufacturing firms in Vietnam after July 2006 have to obtain an environmental standard certificate. Available in the data is a dummy variable indicating if the firm has obtained the certificate, therefore, enabling me to use a Difference-in-Difference (DiD) estimation method. The treatment group will henceforth be defined as the firms that after the amendment in the LPE acquired the certificate. The control group will represent the firms yet to obtain it. With this formulation, I will be comparing the difference in bribing behavior between the treatment and control groups before and after the treatment, conditional on the level of social capital. The DiD-estimation method allows me to isolate the variation of bribing behavior due to acquiring a business certificate between firms that possess the same level of social capital. Important to note is that the focus of this study is not on the benefits (costs) of social capital on overall economic performance and growth, instead the aim is to determine if, and if so how, social capital affects firms in their daily businesses, such as easing or hindering the acquiring of a business license in a corrupt country.

The remainder of the thesis is organized as follows: Section 2 aims to review previous research and establish current knowledge. A theoretical framework is presented in Section 3 to establish how social capital can facilitate corrupt actions and how it can be incorporated into a bargaining model. Section 4 will be attributed to the research question and the hypotheses. Section 5 will explore corruption in the context of Vietnam, the data and the empirical approach. The results are presented and tested in Section 6. Section 7 concludes this paper with a section of closing remarks and my views on future research.

2 Previous Research

In this study, corruption is narrowly defined as the abuse of public office for private gain (Rose-Ackerman 1997; Jain 2001; Maitland 2001). The definition of corruption determines the players of the game, the source of discretionary power and the decisions that may be influenced. Formalizing corruption in this matter ultimately gives rise to three different forms of corruption: "grand corruption", "bureaucratic corruption" and "legislative corruption" (Jain 2001). Since the aim of this paper is to study the variation in bribing-behavior between public officials and firms, the scope will henceforth be limited to bureaucratic corruption, describing the corrupt activities engaged by bureaucrats (administrators) when dealing either with their peers (the political elites) or private actors (individuals or firms) (Leff 1964; Jain 2001; Kreuger 2002). Bureaucratic corruption has, due to its informal characteristics, been predominantly modelled as a principal-agent problem (Klitgaard 1988; Rose-Ackerman 1997; Rose 1998). The resource-allocation model is also commonly used to model bureaucratic corruption, by incorporating market forces in which the supply and demand of the public goods generate an equilibrium (Lien 1986; Rose-Ackerman 1997; Rose 1998; Jain 2001).

Social capital, a term coined by Loury (1977) to describe the usage of individual social relationships as resources for cognitive and social development, has since its inception been incorporated into corruption studies (Coleman 1990; Rose 1998; Lambsdorff, Taube and Schramm 2005). The definitions of social capital generally have one common factor: it enables collective actions of individuals within that social structure that would otherwise not have been possible. There is a rich body of research referred to as the *New Institutional Economics* (NIE) that within the frames of neoclassical theory, studies the effect of social structure on current economic institutions, and under which conditions these structures are more prevalent and influential (Coleman 1990; Rose 1998; Spagnolo 1999).

Rose (1998, p.1) claims that social capital, defined as "the stock of formal or informal social networks that individuals use to produce or allocate goods and services." can be used in empirical studies in three contrasting approaches: situationally, instrumentally and social psychologically. In instrumental terms, social capital can be used as positive enforcements to monitor and enforce micro lenders not to default on their loans and facilitate the production of goods and services. Social capital has also been shown to work as instruments to curb existing formal rules or disrupt market competition by imposing officials to do favors, or taking bribes to (mis)allocate resources, for individuals in their own

network. In situational terms, social capital is the usage of informal networks (e.g. bribes, relationships) to overcome or substitute failures of government bureaucracy (Coleman 1990; Rose 1998).

The institutional view of social capital argues that the political, legal and institutional environments determine the importance and the capacity of community networks and civil society (Spagnolo 1999; Woolcock and Narayan 2000; Jain 2001; Montinola and Jackman 2002). Rock and Bonnett (2004) empirically test the East Asian Paradox using cross-country growth accounting regressions to find that the pattern of high corruption in combination with high growth could only be found in large East Asian countries with a political setting characterized by stable and long-term patron-client networks. That is, reciprocated economic exchanges embedded in social relationships between partners of unequal ranks. These networks helps to facilitate the transaction of bribes and kickbacks in exchange for public provisions and preferential treatments between public officials and large enterprises.

Plentiful studies within the NIE have focused on the informality and opportunistic characteristics of corruption, using social capital as a mechanism to reduce uncertainty and enforce norms (Lambsdorff, Taube and Schramm 2005). Lambsdorff and Teksoz (2004) use traditional contract theory to show that social capital can be used to enforce relational contracts of corruption and compensate for its weaknesses compared to formal contracting. Bernheim and Whinston (1990) develop a model to show that in the presence of social capital, individuals do not only play an economic game but also a social one, that alternates the individual's strategy set substantially. Through linkages between the two games and pooled incentive constraints, defecting in one game would be met with subsequent punishment in both games. Following their lead, Spagnolo (1999) includes social capital as an instrument of positive enforcement that is transferrable in the linked social-economic game. He emphasizes that the feasibility of social capital governance is depended on two factors: the games must be linked and social capital must be large enough to enforce the linked game. In corroboration, Schikora (2014) studies the enforcement problem in the principal-agent problem using social fractionalization–the belonging of a social group–as an enforcement to keep members from deterring in corrupt actions. The crucial feature in her model is perfect information within a sub-network. The model predicts that perfect information about the behavior of an agent, in combination with the commitment to a certain (punishment) strategy, make it costly for individuals to shirk on their obligations, and ultimately enforce the members to comply with the corrupt action, which increases the overall expected payoffs. Similarly, Schramm and Taube (2003) study the Chinese guanxi networks, to find that perfect information within the network plays a crucial role in keeping members from deterring in their

obligations. This can in some settings generate a first best solution in transaction-cost minimization since the dominating strategy for the network-members is to fulfil the mutual exchange of services (Schramm and Taube 2003; Schikora 2014).

An alternative approach to the NIE is the *New Economic Sociology* (NES) which defines social capital in terms of social psychology (e.g. cultural beliefs and norms). Sociologists often point the determinants of corruption to cultural factors, thus, giving social trust, religion and acceptance of hierarchy high explanatory weights (Coleman 1990; Rose 1998; Rose-Ackerman 2006). Granovetter (1985) argues that in contexts where critical regulatory and public services fail, economic transactions will be embedded in social relations, working as a mechanism for generating trust and diminishing uncertainty. La Porta (1997) argues that social capital, defined as the level of trust between individuals, can contribute to lower corruption levels by enabling cooperation amongst bureaucrats and between the bureaucrat and the public.

Studies, defining social capital as the extent to which people in a given society trusts fellow citizens, find negative correlations between trust and corruption (Paldam and Svendsen 2000; Paldam 2002; Bjørnskov 2003; Uslaner 2004). Paldam (2002) and Bjørnskov (2003) were pioneers in empirically showing that changes in social capital is a cause of corruption trends. Using a principal-agent-client model, Bjørnskov (2003) shows that the level of corruption is decreasing in measures of trust, monitoring efforts and the quality of the legal system. However, the link between social capital and corruption, and the direction of causality is not clear. Bjørnskov (2003) states that in a society with higher level of social capital, implying societies with higher levels of honesty and trust or prevailing norms that does not foster corruption, the level of corruption might be lower. In contrast, increased corruption could also lead to less social capital, since signaling honesty and trust might not be efficient. Bjørnskov (2003) and Uslaner (2004) find weak evidence of reverse causation, since it can be shown that trust lowers corruption while the reversed relation is less robust. It is also perceived that cultural variables are invariant over time, hence, there are reasons to believe that causality runs from culture to corruption (Rose-Ackerman 2006).

Scholars within NIE and NES argue that corruption is generally not prevalent in anonymous markets, and can be fostered by repeated interactions between individuals since reciprocity, loyalty and honesty can be facilitated by social institutions (Lambsdorff and Teksoz 2004; Della Porta and Vannucci 2005; Lambsdorff, Taube and Schramm 2005). Kranton (1996) develops a model for the interaction between personalized, long-term exchange relationships and anonymous market exchange and finds that

market exchanges become less likely as the amount of people and the number of goods increase in the exchange. She also shows that the benefits of reciprocal exchange could derive from the prevalence of the reciprocal exchange itself, and that it can persist even when a market exchange would be more efficient. In corroboration, Lambsdorff and Cornelius (2000) find that countries where individuals have higher credibility in corruption reciprocity, also show higher levels of corruption. Anecdotal evidence suggests that corruption can be strengthened and flourish by continued relationships between public officials and private agents and that opportunistic behavior from public officials and their partners is associated with lower levels of corruption, since uncertainties make these transactions costlier (Tanzi 1995; Fisman and Gatti 2006; Rose-Ackerman 2006).

The literature studying price-discrimination and social capital on bureaucratic corruption is more scarce. Research in this area has generally studied the level of corruption and its frictions or its efficiency (Rose-Ackerman 1997). Bargaining friction is defined by Fisman and Gatti (2006) as elements in bribery negotiations that facilitate mutual understandings such as similar ethnic or geographic origin. Besides finding that corruption is strongly negatively associated with the country's investment rate, Mauro (1995) also finds a positive association between greater ethnolinguistic diversity within a country and heightened perceptions of corruption. He speculates this to be linked to bureaucrats favoring members of their own social group. In consistency with Mauro (1995) findings, Maitland (2001) shows that local norms may sanction corruption against multinational enterprises in Vietnam since they are viewed as "outsiders", hence, a more socially accepted group to extract bribes from. Markussen and Tarp (2014) find in their empirical study on Vietnamese household that having a relative who is a politician or someone who holds bureaucratic powers, is accompanied with an increase in land investments–an investment prone to red tape. Similar to Mauro (1995) and Maitland (2001), the authors argue this to be due to nepotism and a "taste for discrimination" among officials since de facto land property rights and access to credit and transfers are strengthened mainly through informal mechanisms rather than formal. Using a quantitative survey from 1995, documenting the exchanges of nearly 60 ministry officials and firm-managers in Vietnam, Appold and Phong (2001) find strong evidence of patron-client relationship patterns between government officials and firm managers. The authors argue this observed pattern to be caused by formal hierarchical dependencies between organizations in the Vietnamese society, since this relation could not be found amongst government officials of equal ranks nor amongst business managers.

3 A Framework for Analyzing Corruption and Social Capital

In this section I will first illustrate how social capital in the form of social network can be used to minimize transaction costs in corruption contracts and facilitate corruption. The latter section will be dedicated to social capital generated by holding a distinguished social position. The underlying assumption is that membership to an elite social group can lead to preferential treatment and increase bargaining power when negotiating a contract of corruption. For this purpose, I will use the corruption-bargaining model by Svensson (2002) to incorporate social capital as presented below.

3.1 Social Networks and Corruption

Basic Principal-Agent Model

The following model and notations are inspired by Laffont and Martimort (2009, pp. 37-43). Consider a firm (the principal) wanting to delegate the production of a public good of q units to a public official (the agent). The principal's value of these units is S(q) where S'>0, S"<0 and S(0)=0, hence, the marginal value of the good is positive and strictly decreasing with the volume acquired.

The agent's production cost is unknown to the principal, however, common knowledge is the fixed production cost F. The agent's marginal cost belongs to the set $\theta = \{\underline{\theta}, \overline{\theta}\}$, capturing that the agent can be of two types: efficient $(\underline{\theta})$ or inefficient $(\overline{\theta})$ with respective probabilities of v and $(1-v)$. Therefore, the agent has the cost function:

(1) $$C(q, \underline{\theta}) = \underline{\theta}q + F \text{ with probability } v \text{ and,}$$

(2) $$C(q, \overline{\theta}) = \overline{\theta}q + F \text{ with probability } (1-v)$$

The spread of the uncertainty in the agent's marginal cost can be denoted as $\Delta\theta = \overline{\theta} - \underline{\theta} > 0$. The timing of the problem is as follows: at time t=0, the agent discovers her type θ which is exogenously given to the players, in t=1 the principal offers the agent a contract which the agent in t=2 accepts or refuses. In t=3 the contract will be executed. Important to note is that the contracts are offered when there is asymmetric information between the parties, hence, the agent can act opportunistically by not revealing her true type. The economic variables of interest are therefore the quantity produced q and the transfer T from the principal to the agent. A formalization on the set of feasible allocations is therefore:

(3) $$A = \{(q, T) : q \in \mathbb{R}_+, T \in \mathbb{R}\}$$

These variables are observable and verifiable by a third party in cases where the contracts are enforced by formal institutions, thus, creating out-of-equilibrium penalties if either contract-party shirk on their contracted obligations. However, this is not the case in corruption contracts, which will be further examined below.

In cases of perfect information, an optimal contract can be produced and sustained between the principal and her agent. The efficient production occurs when the agent's marginal cost equals her marginal benefit. Hence, first-best outputs are given by the following first-order conditions:

(4) $$S'\underline{q}^* = \underline{\theta} \text{ and,}$$

(5) $$S'\overline{q}^* = \overline{\theta}$$

where $\underline{q}^*$ and $\overline{q}^*$ are the efficient production levels. The social values generated by these levels are then respectively:

(6) $$\underline{W}^* = S(\underline{q}^*) - \underline{\theta}\,\underline{q}^* - F \text{ and,}$$

(7) $$\overline{W}^* = S(\overline{q}^*) - \overline{\theta}\overline{q}^* - F$$

The efficient social values should be carried out if they are non-negative. Since by definition of $\underline{q}^*$, $S(\underline{q}^*) - \underline{\theta}\,\underline{q}^* \geq S(\overline{q}^*) - \overline{\theta}\overline{q}^*$ and $S(\overline{q}^*) - \underline{\theta}\,\overline{q}^* \geq S(\overline{q}^*) - \overline{\theta}\overline{q}^*$ since $\overline{\theta} > \underline{\theta}$, thus, the social value generated is greater when the agent is efficient (i.e. $\underline{W}^* \geq \overline{W}^*$).

Social Capital and The Principal-Agent Model

With the simple principal-agent model in mind, this section aims to demonstrate how social capital can be used to enforce informal contracts between the principal and her agent. According to standard contract theory, defining characteristics of corruption implies higher transaction costs and risks than formal contracted transactions (Lambsdorff and Teksoz 2004; Lambsdorff, Taube and Schramm 2005; Furubotn and Richter 2008). First, there exists incomplete information between the parties engaged in the transaction, opportunism is therefore always an option for the actors involved. Second, since corruption is formally considered to be illegal, contract enforcement mechanisms prescribed by law are not valid. Third, the search cost for partners and the cost of negotiating deals in secrecy are estimated to be higher than the costs on the market. Last, there are always risks of getting caught and punished, even after the deal has been concluded. Given these shortcomings, Schweitzer (2004) and

Lambsdorff, Taube and Schramm (2005) argue that social capital can be used as an instrument to enforce these contracts, hence, reducing the uncertainty and risks, as well as reducing the search costs.

To see how this can work in practice, I will depict a type of social network that has been used for centuries in China known as guanxi. Generally, guanxi is defined as "some kind of special relationship between a person who needs something and a person who has the ability to give something." (Schramm and Taube 2003, p.1). Narrowly, guanxi is defined as an exchange dependent on personal relations marked by common elements such as origin of birth, membership in the same party or military units, school alumni or members of the same associations (Schramm and Taube 2003). Members of guanxi networks are generally treated differently compared to non-members, where the welfare of members is prioritized over non-members. It is also reported that the guanxi network creates infrastructures that enables members to curb formal institutions for their own gains (Schramm and Taube 2003; Schikora 2014). Scholars studying guanxi networks state the acceptance of gifts or services within the network to be a sign of agreeing to an informal contract in which the recipient is expected to reciprocate with a service sometime in the future. The entry cost is fixed and considered to be high, as well as the initial engagement with a member in the network. However, as the member engages in transactions within the network, the variable costs is expected to be low and decreasing in the volume of transactions (Xin and Pearce 1996; Fan 2002).

The guanxi network is unique in its sustainability, and scholars consider the situational context, as well as its main integrating force–perfect information within the network–to be the main causes for the network's survival (Schramm and Taube 2003; Schikora 2014). If for some reason a member fail to reciprocate the abstract obligation of repaying a debt when requested, information about a breach in contract will spread within the network. This makes the cost of deterring high since the guanxi networks are based on an iterative system of multiple games, hence, the benefits of a long-term relation exceed the benefits of short-term gains, and the dominating strategy will be to reciprocate. Therefore, guanxi networks contribute to the upholding of long-term reciprocal relations, as well as minimizing transaction costs in illicit transactions, since members' relationships are self-implementing contracts (Schramm and Taube 2003; Schikora 2014). Given this framework it is therefore interesting to test:

H1: Firms within political networks have higher probability of engaging in corrupt activities

3.2 Price-Discrimination and Corruption

Svensson (2002) develops a model to test the bargaining hypothesis on firm-level, that is, if public officials make different bribe demands across firms, given observable firm-characteristics. More specifically, Svensson (2002) uses his model to test if the public official can act as a price (bribe) discriminator when firms obtain public services and if these prices are determined in a bargaining process where the firms' abilities to pay, and their outside options may create refusal power that can explain the differences in firm-level corruption behavior.

Public officials often have control rights to implement and enforce existing regulations such as business regulations, licensing, taxes and provision of public-goods that affect firm activities. This creates an opportunity for corrupt officials to demand informal charges if the current system fails to monitor or hold these officials accountable. Control rights are key in determining the bargaining power since more influence over the control rights, means more leverage in a bribe negotiation. In formal terms, Svensson (2002) states the control rights hypothesis as:

(8) $$P_i = x'w_i + v_i,$$

Where P_i is the probability of firm i paying bribes, w_i is a vector measuring (required) dealings with the public sector, x is a coefficient vector and v_i is an unobserved error-term. The working mechanism in this simple equation is based on the assumption that firms within the same industry should face the same set of rules and regulations and that there are no differences in the number or the extent of interactions with the public sector, thus, heterogeneity in the amount of informal payments must be firm-specific.

As stated by Svensson (2002), a firm's ability to pay depends on its current and future expected profit-flows. For the firm in question, the firm would like to pay as little as possible to the corrupt official, therefore, it will evaluate its options given its ability to pay the informal charges and the cost of not paying and exit the market. The higher the current and expected profits are, the weaker bargaining power the firm will have, since it has a higher ability to pay. The firm's bargaining power also depends on the firm's refusal power, that is, the firm's expected costs of not paying. The refusal power depends on how much profit and expected profit the firm would forgo, how much it would cost for the firm to divest and reallocate into another sector or region and the corruption level in that sector. Assuming a linear relationship, the bargaining hypothesis suggests that the amount of bribes a firm need to pay

is increasing in current and expected future profits and decreasing in expected alternative returns to capital. The bargaining hypothesis can be stated as:

(9) $$b_{it} = \beta_0 + \beta_1 \pi_{it}(k) + \beta_2 E\pi_{it+1}(k) + \beta_3 E\pi_{it+1}(\alpha k) + \varepsilon_{it}$$

where b_{it} is the bribe fee paid from firm i at time t and $\pi_{it}(k)$ is the current profit and a function of the firm's capital stock. $E\pi_{it+1}(k)$ is the expected profit in the next period and β_3 is the coefficient for the expected cost of changing industry, the expected alternative return. Assuming that a share $\alpha \in (0,1)$ of invested capital can be resold and reinvested, changing business will thus reduce profits to $\pi(\alpha k)$. Higher mobility of capital (α) will therefore strengthen the firm's bargaining power since exiting the market is less costly and the public official will be forced to demand a lower bribe. ε_{it} is the composite error term.

In contrast to Svensson's (2002) model, I will factor in social capital to test whether the bribe-paying behavior of a firm, whose owner or manager belongs to a social elite or is socially well-connected, will be significantly different from a manager with less social capital. The bargaining hypothesis can therefore be stated as follows:

(10) $$b_{it} = \beta_0 + \beta_1 \pi_{it}(k) + \beta_2 E\pi_{it+1}(k) + \beta_3 E\pi_{it+1}(\alpha k) + \beta_4 Elite_{it} + \beta_5 Network_{it} + \varepsilon_{it}$$

where β_4 is a measure of social capital generated by being a member of a political elite and β_5 is the extent of political contacts a firm has in its network. Consider a firm being extorted and forced to pay a bribe in order to continue its operations or exit the market. Bargaining with a rent-maximizing public official, the official will try to maximize its gains subject to the constraints that the firm choose not to pay and exit the market and the constant threat of the official getting caught and punished for its effort to exert bribes.

Bailey (1971) and Graeff (2005) argue that powerful people are generally less likely to be sanctioned or follow the rules since their inferior partners are purposely avoiding to sanction them for breaking the norms. With the inclusion of social capital, as a measure of the firm's political status, it could well be the case that firms owned by political elites may not have to conform to these norms. This would imply higher refusal power, hence, stronger bargaining power. Therefore, there are grounds to believe that the parameter β_4 will be negative in (10) since being a member of the Communist Party of Vietnam will entail higher bargaining power. I will therefore be testing the following hypothesis:

H2: Members of the CPV will have a lower bribe-premium

Including political networks as a proxy for social capital, one possible outcome is that favoritism will strengthen the firm's bargaining power since the public official might be driven by a "taste for discrimination" and take this into account in her maximization problem. The official will thus attach higher weight to the welfare of individuals perceived to belong to the "right" social strata or network (Becker 1971; Markussen and Tarp 2014). The obligation of reciprocity may however decrease the refusal power of firms since maintaining and sustaining social capital may imply, in cases where favors are not exchanged in both directions, the exchange of unsolicited gifts and payments (Kranton 1996; Appold and Phong 2001; Taube and Schramm 2005). Furthermore, Coleman (1990) argues that social capital, similar to other types of capital, depreciates over time. This leads to a need for social capital to constantly be renewed by for instance nourishing contacts, hence, increasing the cost. The sign of β_5 in foresight is therefore ambiguous, thus, I will test the following hypothesis:

H3: Politically connected firms will have a lower bribe-premium

4   Research Question and Hypotheses

Evident from previous research is the importance of trust and confidence between corrupt partners that might mitigate potential costs and risks of asymmetric information and opportunistic behavior. Bureaucrats can also have a "taste for discrimination" and favor its own social group. In situational and instrumental terms, social capital implies variations in individuals' incentives and constraints and could ultimately affect their way of getting things done in a given situation.

It is also evident that there is a strong theoretical ground for social capital and corruption, however, there is less empirical ground. This thesis therefore aims to analyze the potential differences in firm-level corruption behavior, given heterogeneity in social capital, generated by having bureaucratic power and by being politically connected. The question I will ask is therefore:

Will a firm's probability of paying informal fees, and the magnitude of these fees, be affected by the firm's social capital?

To answer this question, I will test the following hypotheses:

H1: Firms within political networks have higher probability of engaging in corrupt activities

H2: Members of the CPV will have a lower bribe-premium

H3: Politically connected firms will have a lower bribe-premium

5   The Case of Vietnam

Before introducing the data set and the empirical framework, it is important to understand why the setting of Vietnam is motivated.

5.1   Corruption and the Social Hierarchy in Vietnam

On November 2005, the National Assembly of Vietnam promulgated an "Anti-Corruption Law", which has then been ratified into legislation and included into national strategies. A statement from the National Strategy for Preventing and Combating Corruption Towards 2020 helps to illustrate the extent of corruption in Vietnam and its complications:

"Corruption is still taking place in a rampant, serious and complicated fashion in multiple areas, especially in such areas as administration and use of land, construction investments, equitization of SOE's, management and use of funds, natural resources, mineral resources and State assets, leading to adverse effects in many ways, eroding the confidence of the people in the leadership by the Party and the management by the State, giving rise to potential conflicts of interest, social resistance and protest, and widening the gap between the rich and the poor. Corruption has become a major obstacle for the success of Doi Moi process and the fighting force of the Party, threatening the survival of the regime."

(The Government of Socialist Republic of Viet Nam 2009, p.1)

The Transparency International's Corruption Perceptions Index (CPI) ranked Vietnam in place 120 out of 168 countries and territories in 2009. Between the years of 2005-2009, the CPI ranking for Vietnam has been stable between 2.6-2.7 on a scale from 0 (highly corrupt) to 100 (very clean) (Transparency International 2016). The Enterprise Surveys generated by the World Bank for Vietnam in 2005, show that 67% of firms operating in Vietnam incur informal payments as part of daily business activities. 79% are expected to hand over gifts in meetings with tax officials and 40% find it necessary to pay bribes in order to secure government contracts (World Bank 2005). The Vietnam Provincial Competitiveness Index (PCI) in 2007, measuring economic governance for private sector development, shows that informal charges appear to be particularly rigid, compared to previous years. Nearly 40% of surveyed firms believe public officials use compliance with local regulations as means to extract bribes and user fees (Malesky et al. 2008).

Below are anecdotal descriptions on corruption from a report on the costs of corruption in Vietnam from a macro, provincial and firm perspective generated by the Department for International Development and the Vietnamese Chamber of Commerce and Industry (DFID and VCCI 2014). The following statements suggest that administrative procedures and routines such as permits and applications are common subjects to informal charges.

"This is a routine payment. Everybody does it, so we have to do it too."

"Nobody asked for it–we just put 50,000 to 2,000,000 VND together with the documentation we submitted."

"There is no transparency in our field. When we submit our documents, [the officials] can always find some minor errors and return the files to us. We therefore lose time. To avoid this, we pay, as others would. The actual price tends to be commonly accepted by everyone operating in this sector."

(DFID and VCCI 2014, p. 22)

The authors of the report state that facilitative corruption is a common way of doing business in Vietnam, influenced by the general perception of other firms' behavior in the market. The decentralized nature of decision-making in Vietnam, as well as monopolized control rights, are used to create hurdles for firms wanting to establish themselves in other provinces where there already exist well-established patronage networks between firms and public officials (Appold and Phong 2001; Malesky, Nguyen and Tran 2014; Kinghan and Newman 2015; Tromme 2016). In this setting, the authors argue social capital to be a highly-prized asset since corruption distorts market competition. For firms lacking social capital, corrupt contracts are high-risk strategies since the transaction relies mainly on trust that the public official will adhere to the corrupt contract, creating an unequal playing-field between firms with different levels of social capital. Market competition can also be distorted when social capital (connections) are used to avoid complications and to speed up administrative procedures. A firm in the report stated that they relied on their connections to obtain a commercial license, which reduced the time from 1-1.5 years to 6 months (DFID and VCCI 2014).

In a study on occupational mobility in Vietnam, Kim (2004) identifies an occupational hierarchy in Vietnam consisting of a small elite who works for the state (0.7%) at the top tier. In descending order are: the professionals (3.5%) who through higher education gained social standings, a middle tier relatively better-off workers (24.8%) and farmers who represent 71% of the labor force. The structural

changes resulting from the economic liberalizations and reforms in 1986 did not, however, have an impact on the perception of state-sector jobs, and they are still associated with high status. Compared to successful entrepreneurial ventures, the security and benefits provided for state occupations are perceived preferable, and families with well performing ventures generally do not wish for their children to take over the family businesses, and resources are allocated to gain employment into the state apparatus (Kim 2004).

There are therefore grounds to believe that CPV-members hold a privileged position in the Vietnamese society and that social capital is important in daily business activities.

5.2 The Data

The data used in this study is generated from The Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Vietnam. The survey was funded by DANIDA and collected by members of the Department of Economics at the University of Copenhagen and the Ministry of Labor, Invalids and Social Affairs in Vietnam with the purpose of providing key insights into SME characteristics and dynamics. Conducted every other year, the survey includes over 2,600 different enterprises in ten Vietnamese provinces. More than half are repeated firms in these surveys (CIEM-DANIDA Project 2006, 2008, 2010). At my disposal are the surveys from 2005, 2007 and 2009. As highlighted by the organizations involved in the project, the data set is unique in its cohort nature and the questionnaire has been maintained over time, making this a panel data set adequate for analytical work. The survey is extensive and contains 142 questions, sub-questions excluded. There are some sections in the data set that is of particular interest such as informal payments and networks. In total, I will have 1,525 repeated firms, identified by their firm identity code given to each firm in the beginning of the study. To my knowledge, this data set has not previously been applied to test the relationship between corruption and social capital. The question of whether this dataset is reliable is appropriate to discuss in this section. Academic institutions and professional organizations are behind the collection of the data, therefore, their methods of conduct are most likely to be valid. Furthermore, the survey was conducted for academic reasons, hence, the chances of the data being manipulated to benefit the different authorities and ministries responsible for its existence are considered to be small.

Identification Variables

For the purpose of this study, I will use repeatedly surveyed enterprises that were still in operation and surveyed in 2005, 2007 and 2009. The firms included in this survey were selected at random, using a

15

registry database from the Ministry of Labor, Invalids and Social Affairs. During this time horizon, some firms have ceased to exist, hence, they were not further surveyed in later renditions, and will be excluded from this study. Firms added to the survey after 2005 will not be taken into account, since the aim is to use a panel data estimation method. Excluding the firms that newly entered does not necessarily mean biased results, since the selection process is randomized. However, there might be an issue of excluding firms who went out of business from the estimations if their exit is not randomized. If for instance, firms ceased to exist because they did not bribe public officials in order to further their businesses, the results would be biased since the sample is not representative. A presentation of why firms temporarily exited the market can be found in Appendix A, Table A.1. The results indicate that the main reasons for leaving the market is "lack of demand and orders" and "normal part of business cycle", therefore, it does not seem to be any systematic exiting of firms, rather the exit is determined by market forces.

Note that the designers of this survey have defined the SMEs as firms with no more than 300 employees with some flexibility.[1] Another criterion is that the firm should not be state-owned, that is, the state can only have a maximum stake of 49%. The firms in this sample are active in 21 different manufacturing sectors, described using 4-digit level codes of the ISIC classification, a more detailed presentation of the different sectors can be found in Appendix A, Table A.2.

Main Variable of Interest

Dependent Variables

The dependent variables in this study are proxies for firm manager's engagement in corruption and the extent of it. To test H1, the firm's probability of engaging in corrupt actions, I will be using a dummy variable taking the value of 1 if the firm have paid informal fees during the last year and 0 otherwise as the dependent variable.

The definition of bribes/communication fees includes both solicited and unsolicited gifts. Communication fees are defined as any form of "payment" to government officials, in order to ensure that the enterprise does not "run into" bureaucratic trouble. The data shows that on average, 30% of the firms in the data set paid informal charges, while this percentage is higher for firms owned or managed by a member of the CPV (50%).

---

[1] If in the course of the survey the interviewer finds that the enterprise in fact has somewhat more than 300 employees (but not more than 400) the interviewer may still include it, or if the firm over time has increased in size.

To test the magnitude of the corruption activities, H2-H3, I will be using the log value of paid bribes and communication fees during the last year in 1,000 Vietnamese Dollars (VND).

As for the purpose of paying bribe/communication fees, firms considered the most critical reasons to be: "to get connected to public services", "to deal with tax and tax collectors", "to gain government contracts" and "other reasons". Unfortunately, the answer "other reasons" is not explained further. The observed critical purposes of bribing are true for both the entire sample and the sub-sample with only CPV members.

TABLE 1: PURPOSE OF BRIBE, ALL FIRMS
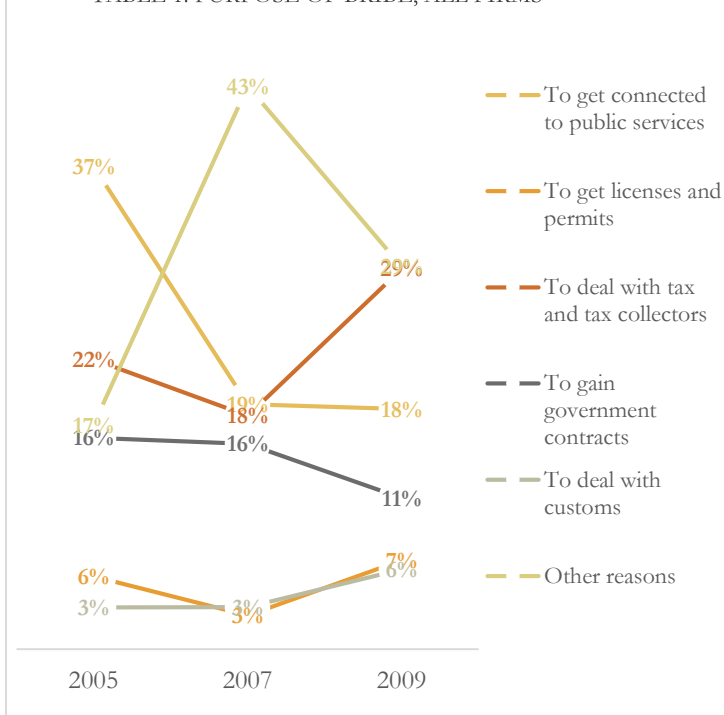
TABLE 2: PURPOSE OF BRIBE, CPV MEMBERS

Legend (both charts):
- To get connected to public services
- To get licenses and permits
- To deal with tax and tax collectors
- To gain government contracts
- To deal with customs
- Other reasons
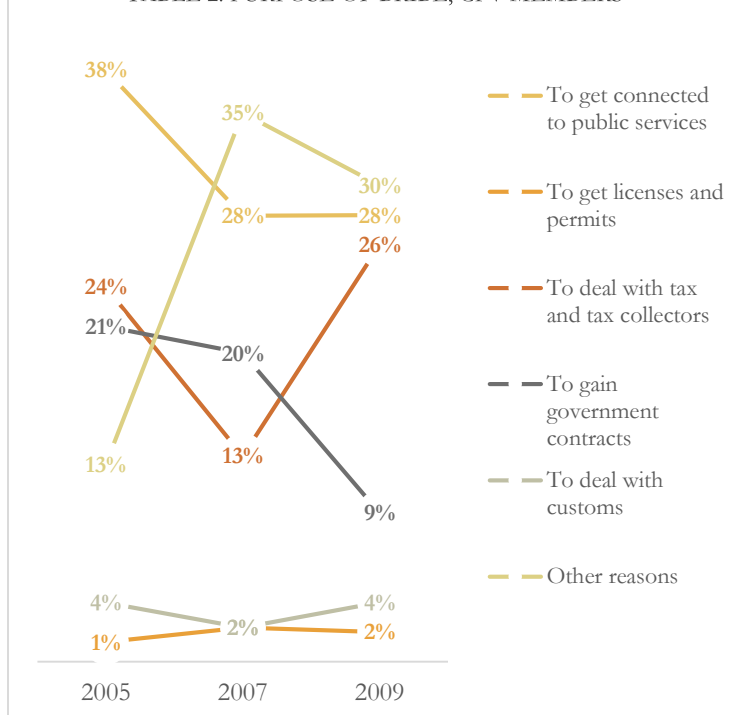
Source: Author's rendering of CIEM-DANIDA Project Data (2005, 2007 and 2009)

Social Capital

In this study, social capital will be measured using two proxies. First, the respondents are explicitly asked if they currently are members of the Communist Party of Vietnam. This indicates not only social belonging to the highest social strata, but it can also be used to control for possible benefits that may entail with being a member of the CPV in negotiating an illicit sale of a public good. The other proxy for social capital is the size of the firms' political network. Firms are asked to disclose in quantity how many politicians and civil workers they speak to or meet with at least once every three months, which by the survey designers is considered "regular contact". This estimate takes values from 0-3, where

the value zero is used to indicate a firm with zero individuals in their political network and so on. If the firm has the value three in the network variable, the firm has three or more people in their political network. In my estimations, I will instead define firm's network to be small or large, where a large network is defined as a network consisting of three or more people, and small otherwise. This is done to make the sample groups larger, since the network size one and two, on their own, are too small to make any valuable inference.

Table 3: A Representation of the Social Capital Variables

CPV		Year		
Respondent is a Member of the CPV	**2005**	**2007**	**2009**	**Total**
No	1,690	1,715	1,707	5,112
Yes	160	135	143	438
Total	1,850	1,850	1,850	5,550
Network Size				
Politicians and Civil Servants	**2005**	**2007**	**2009**	**Total**
0 person	1,170	832	704	2,706
1 person	137	391	347	875
2 persons	183	322	357	862
3 and above persons	360	305	442	1,107
Total	1,850	1,850	1,850	5,550

Source: Author's rendering of CIEM-DANIDA Project Data (2005, 2007 and 2009)

Control Variables

In consistency with the model of Svensson (2002) and to control for omitted variable bias, I will include firm-specific variables such as size, age, revenue and physical assets, all of which are expected to have an effect on firm's informal payment behavior. For example, size may indicate a more visible and profitable firm, making larger firms a more attractive target for bribe-extortion. The age of the firm may also be used as a proxy for firm-visibility, since older firms might be more well-known in their closest regions. Furthermore, older firms may also differ in other unobservable ways compared to younger firms, since they have had longer time to establish relations with authorities. Revenue and physical assets are measures of the firm's ability to pay and these variables should be positively correlated with the informal payment measures (Svensson 2002). Legal status is also added to the regressions since it is perceived that firms with foreign ownership may be subject to preferential treatments or more likely targets for informal charges (Maitland 2012). Furthermore, the number of policy inspections will be added as a control variable since it is indicated by Malesky et al. (2008) that

regulatory inspections are related to government official's interest in extracting usage fees or bribes. Hence, controlling for this also implies controlling for the possible differences in exposure of informal charges from government officials between firms.

In connection with the corruption variables, one interesting variable to control for is the percentage of management's working time spent each month on dealing with government regulations and officials (including taxes, permits, licenses, business and trade regulations). As indicated by the PCI from 2007, 22% of firms in the median province claimed that they have spent 10% or more of their time dealing with government officials (Malesky et al. 2008). The extent of dealings with the government may influence the probability of paying bribes and the level of it. Kaufmann and Wei (1999) find individual assessment of corruption levels with the time spent on dealing with public officials to be significantly positively correlated.

The firms also provided information on paid fees and taxes (in 1,000 VND) which can be used to control for the fact that firms paying high fees and taxes, may not be requested to pay as much in informal payments, since corruption itself can be used to avoid paying taxes. Measurements to capture unobserved differences due to types of firm activities, includes for example a dummy variable indicating export activities, *exportd*. This dummy may capture the differences generated by exporting firms requiring the fulfillment of more licenses and permits than firms serving the domestic market. Thus, the incentive to comply with requests for informal fees might be higher. Controlling for sectoral and provincial differences is made with the inclusion of sector and province dummy variables. Furthermore, variables such as infrastructure and the sum of licenses and permits are included in the regression to control for the differences in the usage of public services and the already acquired authorizations. A more detailed description of all the variables used in this study can be found in Appendix A, Table A.3.

5.3 The Law on Protection of the Environment

On November 2005, the National Assembly of Vietnam amended the Law on Protection of the Environment, which regulates the rights and obligations of Vietnamese state bodies, organizations, family households and individuals with respect to protection of the environment. This is the first time that a license system for waste producers is introduced into law. The amendments ultimately imply that organizations and individuals engaged in manufacturing must perform proper waste management. Those who fulfill the requirements of waste management will receive a certificate of compliance with environmental standards. Firms are not allowed to continue or commence manufacturing activities if

they do not comply with this law. The District People's Committees, the third tier of the government organization, and in some cases Commune People's Committees, are responsible for the registration of the written environmental protection undertakings. The District and Commune People's Committees are also responsible for direct examination and inspection of the implementation of the registered undertakings (VN NA 2005).

These changes in regulations imply a new control right for public officials, and a new contact point for firms and relevant authorities at the third-tier, where opportunistic behavior may emerge. It is not wrong to speculate that firms probably could pay informal or communication fees to get their environment standard certificates, without actually complying with the new regulations or to speed up the process of receiving the certificate using their contacts and social position. Note that this study does not evaluate if paying informal fees are undermining to the economy, the purpose is to determine whether firms with political power and connections can use these assets as leverage in situations where authorities may demand informal charges. The implementation of the LPE started in July 2006 and was applied in a nationwide fashion, under a unified administration. In the panel data set, the question whether the firm has a "Certificate for registration of satisfaction of environmental standards" was first entered into the survey in 2007. More on the LPE can be found in Appendix A.

5.4 The Choice of an Appropriate Estimator

The law amendment provides a setting in which a DiD-estimation can be used. In an ideal setting, the policy change is randomly applied on some treated districts to generate control and treatment groups. The policy change was implemented simultaneously in all districts in Vietnam, under a unified administration, therefore this division of control and treatment group cannot be made. Since I am interested in studying how social capital affects firm-level bribing behavior, and that bribes are often paid to facilitate business certificates in Vietnam, the effect of the exogenous shock implied by the policy change on firm-level corruption behavior can be captured by defining the treatment group as firms that received the certificate and the control group as firms yet to obtain it. Table 4 helps to illustrate the heterogeneity in obtaining the certificate in this data set. Although all firms are required to acquire the certificate, it is evident that not all firms did obtain it, studying this heterogeneity is therefore of interest.

Table 4: Certificate Status for All Firms and on Different Types of Social Capital

All Firms			Certificate		
			No	Yes	Total
		2005	684	0	684
	Year	**2007**	1,648	202	1,850
		2009	1,566	284	1,850
		Total	3,898	486	4,384

Member of the CPV	Certificate			Large Network	Certificate		
	No	Yes	Total		No	Yes	Total
No	3,597	440	4,037	**No**	3,161	321	3,482
Yes	301	46	347	**Yes**	737	165	902
Total	3,898	486	4,384	**Total**	3,898	486	4,384

Source: Author's rendering of CIEM-DANIDA Project Data (2005, 2007 and 2009)

Two assumptions are crucial in order for the DiD-estimation method to produce unbiased estimates: the parallel trend assumption and randomization of the treatment. The parallel trend assumption requires that the trends in bribing behavior in the control and treatment group are the same absent the policy change (Angrist and Pischke 2008; Wooldridge 2015). Given that the assumption of parallel trends holds, a comparison will be made between respondents of similar characteristics to test whether firm-level bribing behavior is significantly different due to the new certificate of environment standards, controlling for the variables of interest–being a member of the CPV and firm's political network.

This assumption cannot be tested with full validity, however, there are indicative test to be made. In Table 5 and 6, the main variables of interest are tested to determine if they are significantly different between the control and treatment group. The variable Network is not significantly different between the groups, however, this hypothesis cannot be rejected for CPV-members. It is concerning that a higher share in the treatment group are CPV-members since membership may affect variables that are correlated with the dependent and independent variables of interest. If membership varies significantly between the groups, this might for instance affect firm-profitability and bribing behavior, which would bias the results. To circumvent this problem, I will therefore run my regressions dividing the sample into three different groups: CPV-membership, large network and small network to mitigate the differences between cohorts.

Table 5: Two-Sample t-Test with Equal Variances Network

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	1520	0.1927632	0.0101212	0.394599	.1729101	.2126162
1	330	0.2030303	0.022177	0.402866	.1594036	.246657
combined	1850	0.1945946	0.0092067	0.395995	.176538	.2126512
diff		-0.0102671	0.0240543		-.0574437	.0369094

diff = mean(0) - mean(1)   t = -0.4268

Ho: diff = 0   degrees of freedom =   1848

Ha: diff < 0	Ha: diff != 0	Ha: diff > 0
Pr(T < t) = 0.3348	Pr(|T| > |t|) = 0.6696	Pr(T > t) = 0.6652

Table 6: Two-Sample t-Test with Equal Variances CPV

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	1520	0.0782895	0.0068924	0.268715	.0647699	.0918091
1	330	0.1242424	0.0181857	0.330359	.0884676	.1600173
combined	1850	0.0864865	0.0065368	0.281157	.0736663	.0993067
diff		-0.045953	0.017046		-.0793848	-.0125216

diff = mean(0) - mean(1)   t = -2.6958

Ho: diff = 0   degrees of freedom =   1848

Ha: diff < 0	Ha: diff != 0	Ha: diff > 0
Pr(T < t) = 0.0035	Pr(|T| > |t|) = 0.0071	Pr(T > t) = 0.9965

In the baseline table, Table 7, it is visible that the control and treatment groups are different at baseline regarding certain variables such as size, age, province and sector. With randomization, one should expect the treatment and the control group on average to be similar, given these results, there might be concerns of manipulation or self-selection into the treatment due to these firm characteristics. However, given that the standard deviations are similar between the groups and that the mean values do not deviate too much, for most variables, there are no strong evidences of treatment randomization being systematically manipulated. However, these are only indicative tests and do not provide strong evidence that the crucial assumptions hold and the following estimations should be interpreted with caution. Provided in Appendix A, Tables A.4.A-C, are the baseline tables separated by CPV-membership and political networks. When the observations are separated using social capital, the variables size and export generate the largest differences between the treatment and control group.

Table 7: Baseline Table for Control and Treatment Group

	Control	Treatment	Difference
CPV	0.0782895 (.0068924)	0.1242424 (.0181857)	-.045953 (.017046)
Export	.0407895 (.0050752)	.1121212 (.0173949)	-.0713317 (.0135741)
Legal Status	1.610526 (.0345081)	2.760606 (.1057475)	-1.15008 (.0889399)
Infrastructure	3.436184 (.0182596)	3.633333 (.0285722)	-0.1971491 (0.0413916)
Network	0.1927632 (.0101212)	.2030303 (.022177)	-.0102671 (.0240543)
Physical Assets (log)	12.51993 (.0443349)	13.86335 (.1008495)	-1.343419 (.1060977)
Policy Inspections	0.5845614 (.021706)	1.014388 (.0536856)	-0.4298271 (0.054563)
Province	44.12303 (.6195886)	49.13333 (1.549931)	-5.010307 (1.51311)
Revenue (log)	19.48476 (.0382592)	20.97512 (.0951361)	-1.490366 (.0932903)
Sector	8.932237 (.1620638)	7.221212 (.3288758)	1.711025 (.3800844)
Size	11.96974 (.5773532)	32.11818 (2.286197)	-20.14844 (1.633569)
Sum of Reg and Permits	1.916501 (.0378584)	2.791411 (.0955754)	-.87491 (.0927721)
Tax Index	0.3564673 (.0044712)	0.3155261 (.0057082)	.0409412(.0099591)
Time Deal with Gov (log)	3.3382 (.0252642)	3.575004 (.0497584)	-.2368032 (.0551929)
Year of Establishment	1978.67 (4.341291)	1974.633 (10.44164)	4.036404 (10.5105)

Source: Author's rendering of CIEM-DANIDA Project Data (2005, 2007 and 2009)

To further test the randomization of treatment assignment in the sample, below is a simple OLS regression model testing the relation of the treatment group on bribery at baseline. Note that the estimate *Treated* is insignificant, implying that the treatment group does not have a significantly higher propensity to pay informal fees compared to the control group at baseline. This result supports that no treatment manipulation has been made by firms in the treatment group in the pre-period, since paying informal fees at baseline can affect the outcome of obtaining a certificate in the post-period. Note that *Network* is significant in the regression, which further motivates a division of social capital when running the regressions since this estimate implies that firms with a large political network have higher probability of paying bribes in the pre-treatment period.

Alternative panel data methods such as Fixed Effect (FE) estimation methods could be used to control for the differences between the control and treatment group. Furthermore, it could be used to filter out any fixed factors that may influence the error term, such as charismatic managers, the manager's family background and location specific factors. Limitations with using FE-estimations however, is that it only uses within-variation in the data, which will ultimately increase standard errors and decrease efficiency (Angrist and Pischke 2008; Wooldridge 2015). To answer my research question, it is of importance to capture the variation created by the policy change, since it represents a situation prone to negotiations of an illicit sale of a public service, thus, using a FE-estimation will not generate a clear

estimate for the treatment effect. Using Regression Discontinuity is not conceivable since there was no creation of critical thresholds (e.g. provincial bounds or firm-size) at the implementation of this policy. Propensity score matching could also be an adequate estimation approach, however, since the DiD-estimation approach will capture the exogenous variation in the law amendment between similar cohorts, given that the crucial assumptions hold, the DiD-estimation approach is preferred.

Table 8: OLS Regression Testing the Randomization of Treatment

VARIABLES	(1) Bribe Dummy	(2) Amount
Network	0.214*	-0.0206
	(0.115)	(0.146)
CPV	-0.142	0.136
	(0.143)	(0.230)
Treated	-0.0211	0.100
	(0.113)	(0.159)
Tax Index	0.588	-0.160
	(0.366)	(0.565)
Policy Inspections	0.223***	0.113
	(0.0529)	(0.0780)
Infrastructure	0.246***	0.0884
	(0.0736)	(0.111)
Sum reg_perm	0.0749**	0.136***
	(0.0371)	(0.0454)
ltime_deal	0.0128	0.117
	(0.0520)	(0.0748)
Size	0.00225	0.00335
	(0.00229)	(0.00223)
Agesq	0.000140	-8.58e-05
	(0.000260)	(0.000143)
lphysical_assets	0.0846**	0.249***
	(0.0348)	(0.0617)
lrevenue	0.212***	0.115
	(0.0478)	(0.0711)
Exportd	0.0796	-0.189
	(0.194)	(0.287)
Constant	-7.391***	-0.231
	(0.969)	(1.384)
Legal status	Yes	Yes
Sector	Yes	Yes
Province	Yes	Yes
FE	No	No
Observations	1,300	560
R-squared		0.397

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.5 Empirical Specification

With this background information at hand, I will run the two following empirical specifications separately on three different groups: CPV-members, large network size and small network size.

(11) $\quad bribed_{it} = \beta_0 + \delta_0 + \delta_1 d2_t + \beta_1 dV_t + \beta_2 dV_t * \delta_1 d2_t + \beta_3 sc_{it} + \beta_k X_{it} + \varepsilon_{it}$

(12) $\quad (lamount)_{it} = \beta_0 + \delta_0 + \delta_1 d2_t + \beta_1 dV_t + \beta_2 dV_t * \delta_1 d2_t + \beta_3 sc_{it} + \beta_k X_{it} + \varepsilon_{it}$

where $d2_t$ is the year dummy variable after the policy change and δ_0 the pre period, allowing for the intercept to change over time. dV_t is the dummy variable, taking a value of 1 if the firm is in the treatment group and 0 otherwise. sc_{it} are dummy variables indicating the size of the network and whether the firm's owner or manager is a member of the CPV for firm i at time t. X_{it} is the vector of firm-specific factors at time t and the unobserved error term is ε_{it}.

Equation (11) aims to test H1. Since the dependent variable is a dummy variable taking the value of 1 if the firm have payed informal fees during the past year and 0 otherwise, I will run a probit model. The major disadvantage of the probit model is that it is more difficult to interpret. Equation (12) will test H2 and H3, therefore, the dependent variable is a continuous variable, the log amount of informal fees paid during the last year in 1,000 VND. Ideally, this estimate would be monthly data including observations from 2006, since the implementation of the law amendment started on July 2006. Since the estimates are based on surveys collected in 2005, 2007 and 2009, this measurement will not be capturing the bribes paid solely due to the change in policy, but also other payments during the year. Furthermore, not all firms obtained the certificate in 2007, and some firms obtained the certificate in 2009, this observation indicates that the process of receiving the certificate is not instantaneous. Thus, using this variable would allow me to study the potential price-discrimination caused by social capital, hence, it is used to test H2-H3, but the treatment effect may not be captured perfectly. Testing this model will also imply greater interpretation possibilities than the probit model. Furthermore, since it is evident that there are some differences between the control and treatment group that might bias the results, I will run a FE-estimation in this specification. The treated group will be filtered out from the regression, since the treatment status is fixed, however, the treatment effect is still captured. In doing this, I will get more robust estimates. This is not possible in the first regression since it is a probit model and cannot be combined with FE.

Important to stress is that the DiD-estimate allows for a comparison between the treatment group and control group before and after the policy change. Therefore, this will capture, even though with potential biases, the sought for relation of social capital on corruption when obtaining a business certificate.

The variables of interest are therefore the DiD-estimates, conditional on social capital:

(13) $$DiD_{(5.5.1)} = \left(\overline{bribed}_{t+1,T} - \overline{bribed}_{t+1,C}\right) - \left(\overline{bribed}_{t,T} - \overline{bribed}_{t,C}\right)$$

(14) $$DiD_{(5.5.2)} = \left(\overline{(lamount)}_{t+1,T} - \overline{(lamount)}_{t+1,C}\right) - \left(\overline{(lamount)}_{t,T} - \overline{(lamount)}_{t,C}\right)$$

5.6 Empirical Issues

One major concern is the informality of corruption that generally makes the respondent reluctant to truthfully disclose their engagements in corrupt activities and the extent of it. Therefore, it is expected that the estimates later presented are biased downwards since individuals tend to understate their actions. Academics that have worked closely in this project and with the data, claims this bias to be small since people in environments where corruption is incorporated into everyday actions, are not as reserved in answering these questions truthfully (Rand and Tarp 2012; Markussen and Tarp 2014). In cases of measurement errors, standard errors are expected to be higher, as the variance in the error term now also includes the measurement error. Another important aspect is that the missing values should not be idiosyncratic, however, I have no method of controlling for this. A solution to attenuation bias is to use instrumental variables or scale the standard errors (Wooldridge 2015). Since I do not have an estimate on the weight of the impact of the missing values, and due to the fact that finding a strong instrument has proven to be difficult with the given data set (and may lead to even larger bias if not chosen properly) I will not pursue these two options further.

Another problem with estimating corruption on social capital is the problem of reverse causality. Bjørnskov and Paldam (2002), Bjørnskov (2003) and Uslaner (2004) tested and found weak evidence of reverse causality. Rose-Ackerman (2006) argues that social capital is constant overtime, making it the active cause for changes in corruption. Testing the reverse relation of social capital on corruption yields no significant results in this setting. The estimated regression can be found in Appendix A, Tables A.5.A and A.5.B. Large sample inference still relies on the assumptions of homoscedasticity and no omitted variables. Homoscedasticity is easily corrected for by giving the sample the correct robust standard errors (Angrist and Pischke 2008; Wooldridge 2015). As for omitted variable bias, it is unlikely that all unobservable factors have been controlled for, hence, it will remain a problem.

6   Results

In a perfect setting, the parallel trend assumption holds and the bias of omitted variables as well as attenuation bias are non-existent. Only then would the estimates be unbiased. Since the parallel trend assumption cannot be tested and the latter assumptions of non-existent biases are violated, the following results should be interpreted with caution.

6.1   Member of the Communist Party

The first two columns in Table 9 below presents the output generated by the empirical models (11) and (12) for CPV-members. Note that this table is a representation of the regression results after all control variables have been added. For a complete presentation of the variation in the estimations when adding additional control variables please see Appendix B.

The output shows no significant results for the treatment effect, *DiD*, on CPV-members in column 1. Note however that the sign of the estimate is negative, indicating that a CPV-member have on average lower probability of paying informal fees after obtaining the certificate, holding all other factors fixed compared to the control group. However, since the estimate is insignificant I will not discuss this further. The estimate *Network* in the same column is positive and significant at all conventional levels. Holding all other factors fixed, this estimate indicates that firms owned or managed by CPV-members with large networks have on average higher probability of paying informal fees compared to firms with small networks at the baseline. This finding thus supports H1. *Network* remains robust when adding additional control variables.

The results for the DiD-estimation specification (12), with informal fees paid as dependent variable, yields no significant treatment effects for CPV-members. The DiD-coefficient is negative, after adding all control variables, however, it is erratic and not stable, going from positive to negative. Therefore, this estimate is not reliable. The coefficient *Network* is positive and significant at the 10% level. This estimate indicates that a firm owned or managed by a CPV-member, that also has a large political network, will on average pay $e^{(1.9)}=6.7$ times higher bribe-premium compared to a firm with a small network at the baseline, holding all other factors fixed. This result helps to rejects H2, that CPV-members will have lower bribe-premiums. Note however that this estimate is not robust and stable. Furthermore, this estimate only becomes significant when adding sector and province control variables.

27

6.2 Large Political and Civil Worker Network

The regression results for firms with large network size are presented in Table 9, columns 3-4. The DiD-estimate, *DiD*, is negative and significant at the 10% level in specification (11), where the dependent variable is binominal. Holding all other factors fixed, this estimate indicates that the treatment effect is negative for a firm with a large network, meaning a politically well-connected firm, in the treatment group, has on average lower probability of paying bribes compared to firms with the same size of network in the control group in the post-period.

The coefficient *Treated* is positive and significant at the 5% level, indicating that the treated firms have on average higher probability of paying informal fees in the year prior to the change in policy, holding all other factors fixed compared to the control group. These results indicate that firms with higher probability of engaging in corrupt activities at the baseline, also have lower probability of paying bribes after obtaining the certificate, thus supporting H1 and theories of reciprocity (Lambsdorff and Cornelius 2000; Della Porta and Vannucci 2005; Lambsdorff, Taube and Schramm 2005).

In contrast to the results for CPV-members, the regression based on the estimation model (12) for firms with large networks yields no significant results for the DiD-estimates. The result therefore generates no evidence to support H3.

6.3 Small Political and Civil Worker Network

The results generated for firms with small political network can be found in Table 9 columns 5-6. The regressions yield no significant results for this group, however the signs of the DiD-estimates in both empirical models are positive. This, in contrast with the results generated for the firms with social capital, indicates that a treated firm with small political network will on average have higher probability of paying informal fees and a higher bribe-premium in the post-period, holding all other factors fixed, compared to the control group. This estimate is however not significant, and this interpretation should not be taken as definite.

Furthermore, the regression also supports the findings of Svensson (2002), where the estimate *revenue, physical assets, size* and *infrastructure* are significant and positive for most of the regressions. For a regression output with complete control variables, please see Appendix B. Number of policy inspections also seem to have a positive and significant impact on firm bribing behavior, supporting firms' claims in the PCI report of 2007 that policy inspections are being used to extract informal payments.

Table 9: Regression Result for DiD-Specifications (11) and (12) for All Three Groups

VARIABLES	CPV		Large Network		Small Network	
	Bribe DV	lamount	Bribe DV	lamount	Bribe DV	lamount
Network	0.599***	1.924*				
	(0.225)	(1.042)				
CPV			0.0781	-0.464	0.00146	0.0207
			(0.173)	(0.384)	(0.0979)	(0.269)
Post Year	-0.416*	-0.810	-0.111	-0.132	-0.588***	0.191
	(0.219)	(0.499)	(0.159)	(0.420)	(0.0695)	(0.178)
Treated	0.0534		0.546**		-0.00423	
	(0.347)		(0.230)		(0.118)	
DiD	-0.249	-1.720	-0.520*	-0.399	0.0940	0.417
	(0.428)	(1.307)	(0.266)	(0.459)	(0.142)	(0.361)
Constant	-30.22	-26.99*	-6.704***	-8.215	-5.441***	-1.800
	(24.20)	(14.93)	(1.357)	(6.285)	(0.621)	(1.908)
Public Service (5)	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Specific (10)	Yes	Yes	Yes	Yes	Yes	Yes
Sector (21)	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes
Province (10)						
Observations	326	142	872	418	3,176	1,041
R-squared		0.791		0.539		0.263
Number of firmid	215	113	688	350	1,542	786

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Network=1 if firm network size is 3 or more
CPV=1 if respondent is a member of the Communist Party of Vietnam
Post Year=1 if year is after the amendment of the Law on Protection of the Environment
Treated=1 if firm will obtain the certificate in later periods
DiD=Difference-in-Difference estimate (Post Year*Treated)

6.4 Discussion

The presented results strongly support H1, where social capital in the form of political networks increases the probability of engaging in corrupt activities. Important to note is that other firm characteristics are important as well in determining firm-level bribing behavior, such as revenue, physical assets, infrastructure and the number of policy inspections.

In the case for CPV-members, it is expected that the belonging to a political elite should increase one's bargaining power in an illicit sale of a public good. The generated results show a positive and significant impact on bribe-premium for CPV-members with a large network, which is not consistent with this claim. Theoretically, it is expected that members of a higher social strata are less likely to follow formal rules or be punished when deviating from the norms. However, it could also be the case that this group consists of wealthier individuals, therefore, they are expected to pay higher bribe-premiums (Graeff 2005). If the latter statement is true, then the observed sign is consistent with this claim and H2 should be rejected. However, this estimate is not stable when adding additional control variables, to the empirical model. This could be explained by the fact that this group is relatively small, and that only 46 firms owned or managed by CPV-members obtained the certificate in the sample. Furthermore, the estimates may also be biased due to missing values in corruption variables and controlling for firm-fixed effects may have left little variation to be captured.

One possible explanation for the negative, but insignificant, DiD-estimate in the specification 12 for CPV-members, other than insufficient data and sample size, is that there may not be a clear trend to be captured in the data. Political networks are costly and need to be maintained. Furthermore, reciprocity may also imply that favors are being rewarded in the form of informal payments, which would be captured as a positive sign in the estimations. However, when it is not reciprocated as an informal payment, but in the forms of a favor, the sign is expected to be negative, hence, it could be the case that there is no clear trend to be captured in the data due to inconsistent behavior in this group. Appold and Phong (2001) find occurrences of rent seeking and the corresponding rent trading as a result of the patron-client relationship where a superior and an inferior individual reciprocate as they both find it beneficial due to hierarchical dependencies between organizations. This pattern was not found between firms or people of similar ranks, therefore, the lack of a hierarchical dependency may be one additional reason to why CPV-members do not show significant results. Perhaps this group are not dependent on others, and can gain the certificate using their own authority.

The insignificant results for firms with small network may be caused by similar reasons as in the case for CPV-members. Perhaps these observations are erratic in their bribing behavior, hence, no clear trends are being captured using this estimation framework. It could also be the case that without a corruption-facilitating network, these firms may not engage in corruption and therefore yield no significant results.

The results for firms with large network strongly support H1 but find no support for H3. Interestingly, the regressions show that for firms with a large network, being in the treatment group will increase the probability of paying informal fees compared to the control group at baseline, however, this is combined with a negative DiD-estimate, meaning that higher probability of paying informal fees in the period before the policy change is accompanied with a significantly lower probability of paying informal fees after the policy change for the treatment group, compared to the control group. Since corruption is generally not prevalent in anonymous markets and perceived to be fostered by repeated interactions between individuals, social institutions can play a key role in generating reciprocity, loyalty and honesty (Lambsdorff and Teksoz 2004). The result may therefore support the above idea, where a one-shot payment in the pre-period has a lagged-effect on corruption into future periods, which is observed by the treated firms having on average a lower probability of having to pay informal fees, compared to the control group in the post-period. However, this estimation also implies a case of selection bias, where the treatment–obtaining the certificate–is not random, but awarded to the firm after paying an informal fee, which is expected in theory but may have biased the results for firms with large networks.

The economic significance of these observations is hard to determine since using a probit-model does not enable straightforward interpretation of the estimates. Furthermore, the results from specification 12, testing the bribe-premium yield only significant results for CPV-members with large networks. The estimate is positive and erratic, indicating instability in the estimate and it should not be interpreted as absolute. The insignificant results on the treatment effect in specification 12 could be explained by the general market perception of informal fees amongst firm. As anecdotal evidence from DFID and VCCI (2014) suggests, the facilitating briberies are not formally determined but follow a benchmark value created by the market. Therefore, the payment may at times be unsolicited, but is paid as a general norm. Thus, there would be weak evidence of price-discrimination in the results. The insignificant results can also be attributed to inadequate data used in this estimation specification.

Missing values, as well as the dependent variable being weak in explaining the bribing behavior specific to the treatment would yield insignificant results.

6.5 Robustness Testing

To test the robustness of these results, I will run the empirical models (11) and (12) above, excluding the DiD-effects. A complete presentation of the regressions and the relevant odds ratios can be found below. Note that the following results may not be representative since they may not capture the relations of perfect counterfactuals, however, using firm-FE can eliminate any firm-specific omitted variable bias, that may have biased the results above.

The results for the probit model is found in Table 10. Consistent with the main regressions using the DiD-model, the estimate for *Network* is robust and significant at all conventional levels. Holding all other factors fixed, the coefficient indicates that on average firms with large networks have higher probability of paying informal fees. Furthermore, the coefficient *Certificate* is positive indicating that obtaining a certificate increases on average the probability of paying bribes, holding all other factors fixed. This estimate is however less robust, and significant at the 5% level. Important to note is that the interaction terms with social capital and certificate has the expected signs but are not significant in any of these regressions. This is probably due to the fact that the estimation model does not differentiate the different time periods in which the policy was implemented, hence, this variation is captured in the certificate variable and the year variables.

Using odds ratios to compare the results between the different groups show that for firms with large networks, the firms yet to receive the certificate, have a 1.614 times higher probability of paying informal fees compared to a firm that has received a certificate. This estimate is significant at the 5% level. This is consistent with the results generated by the DiD-estimation model. Similarly, comparing firms that have received the certificate, differentiated by their political network, the odds ratio is 1.587, indicating that firms with small networks will have 1.587 times higher probability of having to pay informal fees when obtaining the certificate compared to firms with large networks. Similar to the main results, limited significant results are produced when testing the magnitude of the informal fees. The results also show that there is limited price-discrimination between CPV-members, and between CPV-members and firms with large network, since the odds ratios are close to one, 1.028054 and 1.074051 respectively. These estimates are significant at the 1% level. Thus, the weak evidence of CPV-members with large network having to pay higher informal fees from the main regression is not supported in this regression.

Table 10: FE-Model Estimation of Bribe Dummy on Social Capital and Control Variables

VARIABLES	(1) simple	(2) govandpublic service	(3) firm	(4) industry and province
CPV	0.152*	0.209**	0.177*	0.169
	(0.0811)	(0.0900)	(0.0922)	(0.105)
Network	0.409***	0.309***	0.300***	0.239***
	(0.0519)	(0.0585)	(0.0607)	(0.0684)
Certificate	0.522***	0.198**	0.134	0.223**
	(0.0769)	(0.0872)	(0.0902)	(0.101)
CPV*Certificate	0.150	-0.0801	-0.169	-0.249
	(0.267)	(0.275)	(0.307)	(0.326)
Network*Certificate	-0.252*	-0.204	-0.257	-0.239
	(0.137)	(0.155)	(0.163)	(0.176)
CPV*Network*Certificate	-0.0504	-0.00971	0.238	0.00799
	(0.377)	(0.431)	(0.442)	(0.457)
2007.year	-0.578***	-0.601***	-0.710***	-0.559***
	(0.0534)	(0.0804)	(0.0825)	(0.111)
2009.year	-0.425***	-0.469***	-0.541***	-0.333***
	(0.0552)	(0.0683)	(0.0718)	(0.103)
Constant	-0.230***	-1.214***	-4.485***	-4.839***
	(0.0493)	(0.140)	(0.544)	(0.624)
Public Service (5)	No	Yes	Yes	Yes
Firm-Specific (10)	No	No	Yes	Yes
Sector (21)	No	No	No	Yes
Province (10)	No	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	4,384	3,321	3,248	2,924
Number of firmid	1,850	1,608	1,596	1,539

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Odds Ratio for Estimators on Bribe dummy

	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf. Interval]	
CPV-CPV*Certificate	1.519363	0.5675793	1.12	0.263	.730606	3.159656
Network-Network*Certificate	1.613969	0.3376542	2.29	0.022	1.071069	2.432051
Certficate(CPV-Network)	0.9903216	0.3497989	-0.03	0.978	.4955836	1.978953
Certificate(1-CPV)	1.602853	0.575783	1.31	0.189	.7927234	3.240899
Certificate(1-Network)	1.58734	0.3913872	1.87	0.061	.9790182	2.573647
Certificate*CPV(1-Network)	0.7732628	0.5488614	-0.36	0.717	.1923733	3.108203
Certificate*Network(1-CPV)	0.7808199	0.4219209	-0.46	0.647	.2707689	2.251661

Table 11: FE-Model Estimation of log Amount on Social Capital and Control Variables

VARIABLES	(1) simple	(2) govandpublic service	(3) firm	(4) industry and province
CPV	-0.163	-0.326	-0.147	-0.276
	(0.335)	(0.310)	(0.306)	(0.291)
Network	0.345**	0.300	0.232	0.187
	(0.165)	(0.183)	(0.185)	(0.200)
Certificate	0.269	0.414	0.418	0.494
	(0.269)	(0.306)	(0.335)	(0.377)
CPV*Certificate	0.169	0.188	-0.221	-0.304
	(0.606)	(0.753)	(0.793)	(0.928)
Network*Certificate	-0.390	-0.328	-0.162	-0.375
	(0.322)	(0.378)	(0.393)	(0.458)
CPV*Network*Certificate	0.177	-0.0864	0.0897	-0.0538
	(0.638)	(0.790)	(0.873)	(0.974)
2007.year	0.386***	0.420**	0.296	0.229
	(0.148)	(0.194)	(0.184)	(0.232)
2009.year	0.379**	0.274*	0.0349	0.0321
	(0.151)	(0.165)	(0.184)	(0.228)
Constant	7.580***	7.037***	42.50*	46.93*
	(0.121)	(0.511)	(24.66)	(25.18)
Public Service (5)	No	Yes	Yes	Yes
Firm-Specific (10)	No	No	Yes	Yes
Sector (21)	No	No	No	Yes
Province (10)	No	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	1,289	1,160	1,156	1,097
R-squared	0.053	0.110	0.196	0.251
Number of firmid	896	832	829	794

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Odds Ratio for Estimators on log Bribe

	Odds Ratio	Std. Err.	t	P>|t|	[95% Conf. Interval]	
CPV-CPV*Certificate	1.028054	1.123478	0.03	0.98	.1203328	8.783102
Network-Network*Certificate	1.754218	0.9592138	1.03	0.304	.5996962	5.131397
Certficate(CPV-Network)	1.074051	1.105974	0.07	0.945	.1422933	8.107104
Certificate(1-CPV)	2.221391	2.273254	0.78	0.436	.2980016	16.55889
Certificate(1-Network)	2.385888	1.802022	1.15	0.25	.5417122	10.50827
Certificate*CPV(1-Network)	0.7788499	1.42693	-0.14	0.892	.0213592	28.40034
Certificate*Network(1-CPV)	0.7251513	0.8367195	-0.28	0.781	.0752947	6.983821

7 Conclusion and Concluding Remarks

In a world with perfect functioning formal institutions, market forces are expected to distribute public provisions efficiently. In cases where formal institutions fail, public provisions are often embedded in social relations. This study aims to explore the cause and effect of social capital on public provisions and corruption in a society crippled by institutional failure and corruption. Social capital in this study is defined as firms managed or owned by a member of the Communist Party of Vietnam (CPV) and the size of firm's political network. Using a unique data set on Vietnamese small and medium-sized manufacturing firms, and the exogenous shock of an amendment in the Law of Protection of the Environment, the research question if, and if so how, social capital effects the firm's probability of paying informal fees and its magnitude is studied using a Difference-in-Difference (DiD) estimation approach. Two empirical models, one testing the probability of informal payments and one the magnitude of the payments, are applied on three different groups: firms owned or managed by CPV-members, firms with a large political network and firms with small political network.

The results show that political networks have a strong and positive effect on firm-level bribing behavior, supporting theories claiming that networks can be used to facilitate corrupt actions. For firms with large political networks, the treatment effect is negative and significant at the 10% level indicating that firms with large networks, in possession of the certificate, will on average have lower probability to pay informal fees in the post-period compared to the control group. This result is accompanied by a higher propensity to pay informal fees in the period before the policy change, thus, the results not only support the facilitative quality of networks, it also supports theories of reciprocity in corrupt actions, where some form of gift is required to initiate reciprocal relations. These results are strong and robust.

The estimations for CPV-members, produced a positive and significant network coefficient, in both regressions testing informal fee probability and the fee-premium, although the latter estimate is less robust. It is expected that the belonging to a political elite should increase one's bargaining power in an illicit sale of a public good. The signs of the estimates are not consistent with this claim, thus, implying that CPV-members on average have to pay higher informal fees compared to members with a small political network. Perhaps it is the case that more prominent, and also, wealthier individuals are not subjects to preferential treatments, but subjects to higher bribe-demands. Furthermore, the inconsistent results can perhaps be explained by the lack of hierarchical dependency between CPV-members and other public officials. Therefore, this group may not be dependent on others and can

obtain the certificate on their own merit. Another possible explanation for the insignificant results can be that this group is relatively small and insufficient to generate robust and strong results. Furthermore, it can be the case that the bribing behavior is erratic, thus, there are no clear trends to be captured in the data. The strong and robust results for politically well-connected firms can indicate that this form of social capital is the only form of social structure in this study that can facilitate bribery and corrupt actions. This can also be an explanation to why the generated estimates for firms with small networks are insignificant.

Internal validity is achieved by estimating the relation using a DiD-estimation framework. The use of a policy change in the Law on Protection of the Environment implies that the results ultimately captures the effect of social capital on corruption given an exogenous change in the permits to be acquired by firms. To further improve the robustness and validity of these estimates, control variables specific to government and public provisions, as well as firm specific control variables, and sector and province variables are used. Threats to decrease the validity of this study is however the informality of corruption, thus generating error in the data, the violation of the parallel trends assumption and omitted variables bias. As earlier discussed, the presented results should therefore be interpreted with caution and not be taken as absolute. Furthermore, the potential selection bias present, evident by the significant and positive *Treated* estimate, is expected and supported in theory since firms with large networks have better conditions to facilitate corrupt actions. It may also be a requirement to initially pay bribes in order to later gain favors within the network. However, this will bias the result, since the treatment can be manipulated, which in itself is an interesting aspect to consider.

As for economic significance, this study has not focused on the potential benefits (costs) of social capital on economic performance, rather, the focus has been on studying the facilitative characteristics of social capital on bureaucratic corruption. The generated estimations are therefore not adequate to draw such conclusions. Furthermore, in cases where the log value of the informal payment is used, the estimations are not significant nor robust enough to be used in economic verification. However, this study has shown that networks are important in the setting of Vietnam, where firms with larger network also have higher probability of paying informal fees, perhaps to further their own businesses. Therefore, it is compelling to argue, although speculatively, that social capital indeed is an asset that can facilitate corrupt actions, that perhaps, without social capital would be costly and highly risky.

External validity, is more limited since this is a case study specific to Vietnam. The results indicate that having a political network is associated with higher corruption, thus supporting previous research on social capital working as positive enforcements to facilitate corrupt actions. One compelling argument to be made given these results is that perhaps socialist and post-socialist countries have managed to create a system in which corruption, investments and growth can thrive in symbiosis, given that social capital can generate reciprocity and trust. These results therefore make social capital valuable to understand when doing business in these environments and in the works of fighting corruption, as well as to gain a deeper understanding of the East Asian paradox. In designing anti-corruption efforts, it is necessary to consider what type of social capital that may exist in the prescribed context. If corruption is detrimental to the society, one possible policy change would be a rotation system of state-officials, which would disrupt the establishment and maintenance of long-term relationships. Furthermore, if one could make this type of generalization, this finding is not only important for policy makers but also for firms wanting to establish themselves in a highly corrupt country. As a foreign firm, with perhaps limited networks and high language barriers, one needs to consider the ways of doing business and the unwritten rules of the games, and whether or not it is feasible to enter.

For future research, it would be interesting to look into other types of public goods and services, such as taxes or infrastructure and how social capital can lead to heterogeneity in firm-level provisions. Furthermore, it would be interesting to study if other nations with stable and chronic corruption would yield similar results as in the case of Vietnam. Additionally, it would be interesting to study social capital and the levels of corruption in countries that have implemented a rotation system of public officials, since it is perceived that rotation can be an effective mean to reduce corruption in countries where corruption is embedded in social relations.

Literature

Angrist, J. D. and Pischke, J. S. 2008. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton, New Jersey, and Woodstock, Oxfordshire: Princeton University Press.

Appold, S. J. and Phong D. 2001. Patron-Client Relationships in a Restructuring Economy: An Exploration of Interorganizational Linkages in Vietnam. *Economic Development and Cultural Change*, 50(1), pp. 47-76.

Bailey, F. 1971. *Gifts and Poison: The Politics of Reputation*. Schocken Books.

Becker, G. S. 1971. *The Economics of Discrimination*. Chicago: University of Chicago Press.

Bernheim, B. D. and Whinston, M. D. 1990. Multimarket Contact and Collusive Behavior. *The RAND Journal of Economics*, 21(1), pp. 1-26.

Bjørnskov, C. 2003. Corruption and Social Capital. *Aarhus School of Business* [Online]. Available at: http://pure.au.dk/portal/files/32303928/0003139.pdf [Accessed: 8 September 2016].

CIEM-DANIDA Project. 2006. *The Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) 2005* [Online]. Hanoi: Central Institute for Economic Management. Available at: http://www.ciem.org.vn/en/hoptacquocte/duanciem/tracuu.aspx?nam=2006andid=42andmn=10 [Accessed: 8 August 2016].

CIEM-DANIDA Project. 2008. *The Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) 2007* [Online]. Hanoi: Central Institute for Economic Management. Available at: http://www.ciem.org.vn/en/hoptacquocte/duanciem/tracuu.aspx?nam=2008andid=42andmn=8 [Accessed: 8 August 2016].

CIEM-DANIDA Project. 2010. *The Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) 2009* [Online]. Copenhagen: Department of Economics. University of Copenhagen. Available at: http://www.econ.ku.dk/derg/links/vietnam [Accessed: 8 August 2016].

Coleman, J. S. 1990. *Foundations of Social Theory*. Cambridge, Massachusetts, and London, England: The Belknap Press of Harvard University Press.

Della Porta, D. and Vannucci, A. 2005. The Governance Mechanisms of Corrupt Transactions. In: Lambsdorff, J., Taube, M. and Schramm, M. (Eds.). *The New Institutional Economics of Corruption*. New York: Routledge, pp. 152-180.

DFID and VCCI. 2014. *The Costs of Corruption in Vietnam from a Macro, Provincial and Firm Perspective. Edited Report 2014*. Hanoi.

Fan, Y. 2002. Questioning Guanxi: Definition, Classification and Implications. *International Business Review*, 11(5), pp. 543-561.

Fisman, R. and Gatti, R. 2006. Bargaining for Bribes: The Role of Institutions. *International Handbook on the Economics of Corruption*, pp. 127-139.

Furubotn, E. G. and Richter, R. 2008. The New Institutional Economics–A Different Approach to Economic Analysis. *Economic Affairs*, 28(3), pp. 15-23.

The Government of Socialist Republic of Viet Nam. 2009. *Resolution No. 21/NQ‑CP dated 10 May 2009 on Issuance of National Strategy for Preventing and Combating Corruption Towards 2020* [Online], Hanoi: MK Law Firm. Available at:
https://luatminhkhue.vn/en/resolution/resolution-no-21-nq-cp-of-may-12--2009--promulgating-the-national-strategy-against-corruption-up-to-2020-.aspx [Accessed: 31 October 2016].

Graeff, P. 2005. Why Should One Trust in Corruption? The Linkage between Corruption, Norms and Social Capital. In: Lambsdorff, J., Taube, M. and Schramm, M. (Eds.). *The New Institutional Economics of Corruption*. New York: Routledge, pp. 40-59.

Granovetter, M. 1985. Economic Action and Social Structure: The Problem of Embeddedness. *American Journal of Sociology*, 91(3), pp. 481-510.

Jain, A. K. 2001. Corruption: A Review. *Journal of Economic Surveys*, 15(1), pp. 71-121.

Kaufmann, D. and Wei, S. J. 1999. Does "Grease Money" Speed Up the Wheels of Commerce?. *National Bureau of Economic Research* [Online] No. w7093. Available at:
http://www.nber.org/papers/w7093 [Accessed: 28 October 2016].

Kim, J. Y. 2004. Political Capital, Human Capital, and Inter-Generational Occupational Mobility in Northern Vietnam. Social Inequality in Vietnam and the Challenges to Reform. Singapore: *Institute of Southeast Asian Studies*, pp. 166-207.

Kinghan, C. and Newman, C. 2015. Social Capital, Political Connections, and Household Enterprises: Evidence from Vietnam. Helsinki: *WIDER Working Paper* [Online] No. 2015/001. Available at: https://www.wider.unu.edu/publication/social-capital-political-connections-and-household-enterprises [Assessed: 13 September 2016].

Klitgaard, R. 1988. *Controlling Corruption*. Berkeley and Los Angeles, and London, England: University of California Press.

Kranton, R. E. 1996. Reciprocal Exchange: A Self-Sustaining System. *American Economic Review*, 86(4), pp. 830-851.

Krueger, A. O. 2002. *Political Economy of Policy Reform in Developing Countries*. Cambridge, Massachusetts: The MIT Press.

La Porta, R. 1997. Trust in Large Organizations. *American Economic Review*, 87(2), pp. 333-338.

Laffont, J. J. and Martimort, D. 2009. *The Theory of Incentives: The Principal-Agent Model*. Princeton University Press.

Lambsdorff, J. G. and Cornelius, P. 2000. Corruption, Foreign Investment and Growth. *The Africa Competitiveness Report 2000/2001*. New York, Oxford: World Economic Forum, Oxford University Press.

Lambsdorff, J. G., and Teksoz, S. U. 2004. Corrupt Relational Contracting. In: Lambsdorff, J., Taube, M. and Schramm, M. (Eds.). *The New Institutional Economics of Corruption*. New York: Routledge, pp. 138-151.

Lambsdorff, J., Taube, M. and Schramm, M. 2005. Corrupt Contracting: Exploring the Analytical Capacity of New Institutional Economics and New Economic Sociology. In: Lambsdorff, J., Taube, M. and Schramm, M. (Eds.). *The New Institutional Economics of Corruption*. New York: Routledge, pp. 1-16.

Leff, N. H. 1964. Economic Development Through Bureaucratic Corruption. *American Behavioral Scientist*, 8(3), pp. 8-14.

Lien, D. H. D. 1986. A Note on Competitive Bribery Games. *Economics Letters*, 22(4), pp. 337-341.

Loury, G. 1977. A Dynamic Theory of Racial Income Differences. *Women, Minorities, and Employment Discrimination*. pp. 153-188.

Maitland, E. 2001. Corruption and the Outsider: Multinational Enterprises in the Transitional Economy of Vietnam. *The Singapore Economic Review*, 46(1), pp. 63-82.

Malesky, E. et al. 2008. *The Vietnam Provincial Competitiveness Index: Measuring Economic Governance for Private Sector Development, 2007 Final Report*. Hanoi: Vietnam Chamber of Commerce and Industry and United States Agency for International Development [Online] Available at: https://asiafoundation.org/resources/pdfs/VNPCI2007.pdf [Accessed: 18 October 2016]

Malesky, E. J., Nguyen, C. V. and Tran, A. 2014. The Impact of Recentralization on Public Services: A Difference-in-Differences Analysis of the Abolition of Elected Councils in Vietnam. *American Political Science Review*, 108(1), pp. 144-168.

Markussen, T. and Tarp, F. 2014. Political Connections and Land-Related Investment in Rural Vietnam. *Journal of Development Economics*, 110, pp. 291-302.

Mauro, P. 1995. Corruption and Growth. *The Quarterly Journal of Economics*, 110(3), pp. 681-712.

Montinola, G. R. and Jackman, R. W. 2002. Sources of Corruption: A Cross-Country Study. *British Journal of Political Science*, 32(1), pp. 147-170.

Paldam, M. 2002. The Cross-Country Pattern of Corruption: Economics, Culture and the Seesaw Dynamics. *European Journal of Political Economy*, 18(2), pp. 215-240.

Paldam, M. and Svendsen, G. T. 2000. Missing Social Capital and the Transition in Eastern Europe. Copenhagen: *Department of Economics, Faculty of Business Administration, Aarhus School of Business* [Online]. Available at: http://www.hha.dk/nat/wper/00-5_gts.pdf [Accessed: 8 September 2016]

Rand, J. and Tarp, F. 2012. Firm-level Corruption in Vietnam. *Economic Development and Cultural Change*, 60(3), pp. 571-595.

Rock, M. T. and Bonnett, H. 2004. The Comparative Politics of Corruption: Accounting for the East Asian Paradox in Empirical Studies of Corruption, Growth and Investment. *World Development*, 32(6), pp. 999-1017.

Rose, R. 1998. Getting Things Done in an Anti-Modern Society: Social Capital Networks in Russia. In: Dasgupta, P. and Serageldin, I. (Eds.). *Social Capital: A Multifaceted Perspective*. Washington, D.C.: The World Bank, pp. 147-171.

Rose-Ackerman, S. 1997. The Political Economy of Corruption. Elliott K. A. (Ed.). *Corruption and the Global Economy*. Washington, D.C., pp. 31-60.

Rose-Ackerman, S. (Ed.). 2006. *International Handbook on the Economics of Corruption*. Northampton, MA: Edward Elgar Publishing.

Schikora, J. T. 2014. How do Groups Stabilize Corruption?. *Journal of International Development*, 26(7), pp. 1071-1091.

Schramm, M. and Taube, M. 2003. The Institutional Economics of Legal Institutions, Guanxi, and Corruption in the PR China. Kidd, J. and Richter, F. J. (Eds.). *Fighting Corruption in Asia: Causes, Effects and Remedies*. Singapore: World Scientific, pp. 271-96.

Schweitzer, H. 2004. Corruption–its Spread and Decline. In: Lambsdorff, J., Taube, M. and Schramm, M. (Eds.). *The New Institutional Economics of Corruption*. New York: Routledge, pp. 16-40.

Spagnolo, G. 1999. Social Relations and Cooperation in Organizations. *Journal of Economic Behavior and Organization*, 38(1), pp. 1-25.

Svensson, J. 2002. Who Must Pay Bribes and How Much? Evidence from a Cross-Section of Firms. *Quarterly Journal of Economics*, 118(1), pp. 207-230.

Tanzi, V. 1995. Corruption: Arm's-Length Relationships and Markets. In: Fiorentini, G. and Peltzman, S. (Eds.). *The Economics of Organized Crime*. Cambridge, New York and Melbourne: Cambridge University Press, pp. 161-180.

Transparency International. 2016. *CPI 2015* [Online]. Germany: Transparency International Secreteriat. Available at: http://www.transparency.org/cpi2015 [Accessed: 18 October 2016].

Treisman, D. 2000. The Causes of Corruption: a Cross-National Study. *Journal of Public Economics*, 76(3), pp. 399-457.

Tromme, M. 2016. What Next for Anti-Corruption Research in Vietnam?. *Crime, Law and Social Change*, 65(4-5), pp. 445-458.

Uslaner, E. M. 2004. Trust and Corruption. In: Lambsdorff, J., Taube, M. and Schramm, M. (Eds.). *The New Institutional Economics of Corruption*. New York: Routledge, pp. 76-95.

World Bank and Ministry of Planning and Investment of Vietnam. 2016. *Vietnam 2035: Toward Prosperity, Creativity, Equity, and Democracy*. Washington, DC: World Bank.

VN NA. 2005. *Law on Protection of the Environment* [Online], Hanoi: NA of Socialist Republic of Vietnam. Available at: https://haiduong.eregulations.org/media/Law%20on%20Enviroment.pdf [Assessed: 7 October 2016].

Woolcock, M. and Narayan, D. 2000. Social capital: Implications for Development Theory, Research, and Policy. *The World Bank Research Observer*, 15(2), pp. 225-249.

Wooldridge, J. M. 2009. *Introductory Econometrics: A Modern Approach*. Canada: South-Western.

World Bank. 2005. *Business Environment and Enterprise Performance Survey 2005, Vietnam 2005* [Online]. Washington D.C.: European Bank for Reconstruction and Development, World Bank. Available at: http://microdata.worldbank.org/index.php/catalog/609 [Assessed: 10 October 2016].

Xin, K. K. and Pearce, J. L. 1996. Guanxi: Connections as Substitutes for Formal Institutional Support. *Academy of Management Journal*, 39(6), pp. 1641-1658.

Appendix A

Reasons for Entering and Exiting the Market

Table A.1: Reason for Temporary Closure

	Freq.	Percent	Cum.
Too much competition	25	6.93	6.93
Low quality products	8	2.22	9.14
Poor distribution/marketing channels/marketing skills	5	1.39	10.53
Production costs too high	7	1.94	12.47
Difficulties in getting inputs/raw material	18	4.99	17.45
Lack of demand/orders	147	40.72	58.17
Shortage of qualified labour	3	0.83	59
Normal part of business cycle	69	19.11	78.12
Other	79	21.88	100
Total	361	100	

Source: Author's rendering of CIEM-DANIDA Project Data (2005, 2007 and 2009)

ISIC Classification

Table A.2: Representation of the 21 Sectors in the Data

Sectors	Dummies in the data set	3-digit	4-digit
Agriculture	0	151-153	1511-1533
Food and beverages	1	154-155	1541-1554
Tobacco	2	160	1600
Textiles	3	171-173	1711-1730
Apparel	4	181-182	1810-1820
Leather	5	191-192	1911-1920
Wood	6	201-202	2021-2029
Paper	7	210	2102-2109
Publishing and printing	8	221-223	2211-2230
Refined petroleum etc.	9	231-233	2310-2330
Chemical products etc.	10	241-242	2411-2429
Rubber	11	251	2511-2519
Non-metallic mineral products	12	252-269	2520-2699
Basic metals	13	271-273	2710-2732
Fabricated metal products	14	281-289	2811-2899
Electronic, machinery, computers, radio	15	291-333	2911-3330
Motor vehicles etc.	16	341-353	3410-3530
Other transport equipment	17	359	3591-3599
Furniture, jewellery, music equipment	18	361-369	3610-3699
Recycling etc.	19	371-372	3710-3720
Services	20	400-490	4000-4900

Source: Author's rendering of CIEM-DANIDA Project Data (2005, 2007 and 2009)

A.3 Manual for Independent and Dependent Variables

Variable	Definition
Age^2	Squared age of the firm (year of establishment - current year)
Bribe (log)	Payed bribes or communication fees during the last year (in 1,000 VND). Includes both solicited and unsolicited gifts and communication fees is defined as any form of "payment" to government officials, in order to ensure that the enterprise does not "run into" bureaucratic trouble.
Bribed	A dummy variable (=1) if firm payed bribe in last year (=0 otherwise)
Certificate	A dummy variable (=1) if firm has obtained the environmental standards certificate (=0 otherwise)
CPV	=1 if the respondent has other position of responsibility: member of the Communist Party
Export	A dummy variable (=1) if firm engages in exporting activities (=0 otherwise)
Firm ID	Identification number each firm is identified with in the survey(s)
Form of ownership/legal status	The firm's legal status. Household establishment/business (1), Private (sole proprietorship) (2), Partnership (3), Collective/Cooperative (4), Limited liability company (5), Joint stock company with state capital (6), Joint stock company without state capital (7), Joint venture with foreign capital (8), State enterprise (central) (9), State enterprise (local) (10)
Infrastructure	Infrastructure service Index (0–5) of availability of public services. The index is the sum of dummy variables indicating if electricity, water, telephones, waste disposal, and paved roads are available (service dummy 5-1 if available, 0 otherwise)
Network	Quantity how many people firm have regular contact with whom are politicians and civil workers that they speak to/meet with at least once every 3 months. (=1 if number of people is three or more, 0 otherwise)
Physical Assets (log)	Total physical assets, a combination of land, buildings, equipment/machinery, transport equipment, raw materials, input inventories, finished goods/inventories in 2004, 2006, 2008 end-year value in 1,000 VND
Policy Inspections	Number of policy inspections during the last year
Post Year	Year after the implementation of the amendment in the Law on Protection of the Environment (Post 2005)
Province	Province the firm is registered in (10 different provinces)
Revenue (log)	log of nominal revenues (in 1000 VND) as reported during the last year
Sector	Main area of business and production activity. Sector based on ISIC codes.
Size	Size of the firm in absolute numbers of employees
Sum of registration and permits	The sum of Business registration certificate, Tax code registration certificate, Social insurance registration certificate, Investment certificate, Environmental standards certificate, Fire prevention certificate, Technology transfer certificate, Seal engraving permit, Remittances transfer permit and License to operate overseas accounts (Dummy 9-1 if available, 0 otherwise)
Tax Index	Tax Index (0–7) of types of taxes paid. Corporate Income Tax (if registered under Enterprise Law) or Household Business Income Tax (if Household Establishment); Value Added Tax (VAT); Business Registration Tax (Commercial license tax); Import/Export taxes; Special Consumption Tax (Luxury good taxation); Property/Enterprise tax (Stamp duties); Other taxes. The index is the sum of dummy variables indicating if taxes have been paid. (tax dummy 7-1 if available, 0 otherwise)
Time to deal with government (log)	log of Percentage of managers working time dealing with state authorities per month
Treated	Division of firms based on the obtainment of the environmental standards certificate (=1 if firm will obtain the certificate, 0 otherwise)

Source: Author's rendering of CIEM-DANIDA Project Data (2005, 2007 and 2009)

Descriptive Statistics

Table A.4.A: Descriptive Statistics at Baseline: Full Sample

	Treatment Group				Control Group			
	mean	sd	min	max	mean	sd	min	max
Year of Establishment	1974.633	189.6819	0	2003	1978.67	169.2547	0	2003
Bribe (log)	8.042163	1.681871	0.6931472	11.69525	7.228616	1.57583	0.6931472	12.61154
Bribed	0.5757576	0.494978	0	1	0.3546053	0.478551	0	1
CPV	0.1242424	0.3303588	0	1	0.0782895	0.268715	0	1
Export	0.1121212	0.3159947	0	1	0.0407895	0.1978673	0	1
Legal Status	2.760606	1.920999	1	7	1.610526	1.345373	1	7
Infrastructure	3.633333	0.5190397	2	5	3.436184	0.7118899	1	5
Network	0.2030303	0.4028658	0	1	0.1927632	0.3945985	0	1
Physical Assets (log)	13.86335	1.832023	7.757906	18.01774	12.51993	1.727925	5.703783	17.40741
Policy Inspections	1.014388	0.895118	0	2	0.5845614	0.8193843	0	2
Province	49.13333	28.15589	1	80	44.12303	24.15601	1	80
Revenue (log)	20.97512	1.728233	16.21341	26.35177	19.48476	1.491129	15.20181	24.21567
Sector	7.221212	5.974325	1	18	8.932237	6.318412	1	19
Size	32.11818	41.53083	1	280	11.96974	22.50937	1	250
Sum of Registration and Permits	2.791411	1.725658	-1	10	1.916501	1.470641	0	10
Tax Index	0.3155261	0.1036951	0	0.6931472	0.3564673	0.1743211	0	0.6931472
Time to Deal with Government (log)	3.575004	0.8732566	1.386294	4.60517	3.3382	0.8567522	0	4.60517
Treated	1	0	1	1	0	0	0	0

Source: Author's rendering of CIEM-DANIDA Project Data (2005, 2007 and 2009)

Table A.4.B: Descriptive Statistics at Baseline: CPV-Members

	Treatment Group				Control Group			
	mean	sd	min	max	mean	sd	min	max
Year of Establishment	1991.707	11.57852	1958	2003	1993.126	8.71153	1960	2003
Bribe (log)	8.444739	1.465235	4.60517	11.51293	7.852895	1.7674	4.60517	12.38839
Bribed	0.7560976	0.4347694	0	1	0.4117647	0.494234	0	1
Certificate	0	0	0	0	0	0	0	0
Export	0.195122	0.4012177	0	1	0.0588235	0.236289	0	1
Legal Status	4.073171	1.876036	1	7	1.932773	1.527883	1	7
Infrastructure	3.707317	0.4606464	3	4	3.478992	0.6745839	2	5
Network	0.2926829	0.4606464	0	1	0.2773109	0.4495642	0	1
Physical Assets (log)	14.682	1.389228	11.02679	18.01774	12.81059	1.610192	9.264829	17.04613
Policy Inspections	0.9189189	0.953892	0	2	0.6216216	0.8426587	0	2
Province	31.34146	21.46114	1	79	38.11765	19.84268	1	80
Revenue (log)	21.54725	1.624501	17.39903	24.09344	19.67179	1.578384	16.4182	24.0083
Sector	7.926829	5.854017	1	18	9.277311	6.313725	1	18
Size	49.78049	48.58421	1	200	16.45378	24.90754	1	150
Sum Registration and Permits	3.410256	1.887883	1	10	2.025641	1.516925	0	8
Tax Index	0.3397915	0.1177768	0.1541507	0.6931472	0.3614918	0.1829029	0.1541507	0.6931472
Time to Deal with Government (log)	3.514996	0.9144318	1.609438	4.60517	3.371949	0.8614181	1.609438	4.60517
Treated	1	0	1	1	0	0	0	0

Table A.4.C: Descriptive Statistics at baseline: Networks three or more

	Treatment Group				Control Group			
	mean	sd	min	max	mean	sd	min	max
Year of Establishment	1969.385	203.4259	0	2003	1987.955	94.72236	0	2003
Bribe (log)	8.188001	1.479801	4.60517	11.69525	7.24509	1.71237	1.386294	12.20607
Bribed	0.6354167	0.4838397	0	1	0.3736018	0.4843018	0	1
CPV	0.1875	0.3923613	0	1	0.1029083	0.3041795	0	1
Export	0.1458333	0.3547918	0	1	0.049217	0.2165632	0	1
Legal Status	2.90625	1.919858	1	7	1.588367	1.300448	1	7
Infrastructure	3.59375	0.5145898	2	4	3.371365	0.7371522	1	5
Physical Assets (log)	13.94171	1.765466	8.716044	18.01774	12.41482	1.708179	8.281471	16.85136
Policy Inspections	0.9	0.9000624	0	2	0.543943	0.8142146	0	2
Province	43.32292	29.91725	1	80	40.58389	24.98648	1	80
Revenue (log)	20.9375	1.783909	17.62217	25.00513	19.37955	1.566378	15.20181	24.10426
Sector	7.166667	5.857369	1	18	9.348993	6.484123	1	19
Size	39.30208	52.032	1	280	12.86577	28.06031	1	250
Sum Registration and Permits	2.75	1.707289	-1	10	1.803167	1.587848	0	10
Tax Index	0.3115708	0.1041737	0	0.6931472	0.3194424	0.1607834	0	0.6931472
Time to Deal with Government (log)	3.657872	0.8248406	1.609438	4.60517	3.516137	0.9012144	0	4.60517
Treated	1	0	1	1	0	0	0	0

Source: Author's rendering of CIEM-DANIDA Project Data (2005, 2007 and 2009)

Reverse Causality Estimations

Table A.5.A: Probit Model Estimation of Bribe Dummy on
Social Capital and Control Variables

VARIABLES	(1) CPV	(2) Network
bribed	-0.00890	0.0248
	(0.131)	(0.0501)
1.Network	0.00395	
	(0.166)	
2.Network	-0.0819	
	(0.170)	
3.Network	0.125	
	(0.138)	
CPV		0.112
		(0.165)
		(0.136)
Constant	-7.608***	-1.873***
	(1.085)	(0.565)
Public Service (5)	Yes	Yes
Firm-Specific (10)	Yes	Yes
Sector (21)	Yes	Yes
Province (10)	Yes	Yes
Observations	3,138	3,624

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

1.Network=firms with network equal to 1
2.Network=firms with network equal to 2
3.Network=firms with network equal to 3 or more

Table A.5.B: FE-Estimation Model of Bribe Dummy on Social Capital and Control Variables

VARIABLES	(1) CPV	(2) Network
lbribe	-0.00304	-0.00606
	(0.00516)	(0.0457)
1.Network	-0.0113	
	(0.0234)	
2.Network	-0.0173	
	(0.0194)	
3.Network	-0.0325*	
	(0.0171)	
CPV		-0.547**
		(0.252)
Constant	10.81	-291.6***
	(9.882)	(69.33)
Public Service (5)	Yes	Yes
Firm-Specific (10)	Yes	Yes
Sector (21)	Yes	Yes
Province (10)	Yes	Yes
FE	Yes	Yes
Observations	1,459	1,459
R-squared	0.038	0.184
Number of firmid	972	972

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

1.Network=firms with network equal to 1
2.Network=firms with network equal to 2
3.Network=firms with network equal to 3 or more

Law on Protection of the Environment

In 2005, The Law of Protection of the Environment was amended. Coming into effect in July 2006, the amendment implied an obligation for manufacturing firms in Vietnam to register their activities and waste management plans and henceforth comply with environmental standards. If adequate, the firm would obtain an environment standard certification which is crucial in order to continue one's manufacturing activities. Prescribed in Article 37 *Environmental protection in respect of manufacturing, business and services establishments*, manufacturing, business and services establishments must satisfy the following environmental protection requirements:

(a) Have a system for collection and treatment of waste water which satisfies environmental standards;

(b) Have adequate means and equipment for collection and storage of solid waste and classify such solid waste at source;

(c) Take measures to minimize and treat dust and gaseous waste to satisfy standards prior to discharging the waste into the environment, ensuring that no gaseous waste, toxic gas and fumes will be leaked or dispersed into the environment; to limit noise, light and heat which adversely affects the surrounding environment and employees;

(d) Ensure adequate resources, facilities and equipment to prevent and deal with environmental incidents, particularly in the case of manufacturing establishments using chemicals, radioactive substances, inflammable substances or explosives.

Certificates of compliance with environmental standards will be issued to organizations and individuals engaged in manufacturing, business and services activities who perform proper waste management. The District people's committees are responsible for the registration of the written environmental protection undertaking and in some cases, a commune people's committee may be authorized to organize this registration. The written environmental protection undertaking must include information of the location of production, waste management etc. The timeframe of accepting a written environmental protection undertaking imprinted in law is five working days from the date of receipt. The entities required to register for the written environmental protection undertakings will be permitted to commence their manufacturing or provision of services only after registration of their written environmental protection undertaking. The district and commune people's committees are also responsible for direct examination and inspection of the implementation of the registered undertakings.

Appendix B

Main Results CPV-Members

Table B.1.A: DiD-Estimation on Bribe Dummy for CPV-Members

VARIABLES	(1) bribed	(2) govandpublic service	(3) firm	(4) industry and province
Network	0.471***	0.460***	0.532***	0.599***
	(0.126)	(0.163)	(0.169)	(0.225)
Post Year	-0.338***	-0.124	-0.284	-0.416*
	(0.129)	(0.177)	(0.186)	(0.219)
Treated	0.892***	0.466	0.348	0.0534
	(0.248)	(0.315)	(0.303)	(0.347)
DiD	-0.114	-0.396	-0.385	-0.249
	(0.325)	(0.433)	(0.423)	(0.428)
pay_tax		0.487	0.578	0.967**
		(0.362)	(0.444)	(0.491)
policy_inspections		0.406***	0.373***	0.458***
		(0.103)	(0.111)	(0.125)
infrastructure		-0.0505	-0.101	-0.155
		(0.0917)	(0.112)	(0.127)
sumreg_permits		0.204***	0.121	0.129
		(0.0733)	(0.0813)	(0.0866)
ltime_deal		0.0826	0.0302	0.0125
		(0.0764)	(0.0798)	(0.0954)
size			-0.00481**	-0.00482*
			(0.00245)	(0.00272)
age2			0.00891	0.0111
			(0.0120)	(0.0121)
lphysical_assets			0.101	0.142
			(0.0892)	(0.104)
lrevenue			0.171	0.310***
			(0.109)	(0.118)
exportd			-0.549*	-0.593*
			(0.318)	(0.355)
Constant	-0.342***	-1.206***	-23.19	-30.22
	(0.121)	(0.466)	(24.34)	(24.20)
Legal status (4)	No	No	Yes	Yes
Sector (21)	No	No	Yes	Yes
Province (10)	No	No	Yes	Yes
Firm FE	No	No	No	No
Observations	438	330	326	326
Number of firmid	271	218	215	215

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Network=1 if firm network size is 3 or more
CPV=1 if respondent is a member of the
Communist Party of Vietnam
Post Year=1 if year is after the amendment of the Law on
Protection of the Environment
Treated=1 if firm will obtain the certificate in later periods
DiD=Difference-in-difference estimate (Post Year*Treated)

Table B.1.B: DiD-Estimation on Bribe Intensity for CPV-Members

VARIABLES	(1) lbribe	(2) govandpublic service	(3) firm	(4) industry and province
Network	0.434	0.392	0.245	1.924*
	(0.338)	(0.361)	(0.657)	(1.042)
Post Year	0.525	0.897	0.476	-0.810
	(0.406)	(0.567)	(0.845)	(0.499)
DiD	0.290	0.723	0.307	-1.720
	(0.697)	(0.676)	(1.005)	(1.307)
pay_tax		-0.0283	-1.294	2.717
		(2.221)	(2.186)	(2.885)
policy_inspections		0.410	0.318	0.400*
		(0.265)	(0.276)	(0.224)
infrastructure		-0.643**	-0.500	-1.086***
		(0.265)	(0.353)	(0.242)
sumreg_permits		0.0557	0.0539	-0.992*
		(0.245)	(0.290)	(0.528)
ltime_deal		-0.197	-0.332	-0.449**
		(0.268)	(0.274)	(0.203)
size			0.0224	-0.00191
			(0.0254)	(0.0391)
lphysical_assets			0.368	0.0654
			(0.566)	(0.292)
lrevenue			-0.139	1.916**
			(0.602)	(0.778)
exportd			0.939	2.078
			(2.925)	(3.598)
Constant	7.677***	9.921***	7.639	-26.99*
	(0.215)	(1.871)	(12.92)	(14.93)
Legal status (4)	No	No	Yes	Yes
Sector (21)	No	No	Yes	Yes
Province (10)	No	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	163	142	142	142
R-squared	0.129	0.296	0.510	0.791
Number of firmid	127	113	113	113

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Network=1 if firm network size is 3 or more
CPV=1 if respondent is a member of the Communist Party of Vietnam
Post Year=1 if year is after the amendment of the Law on Protection of the Environment
Treated=1 if firm will obtain the certificate in later periods
DiD=Difference-in-difference estimate (Post Year*Treated)

Table B.2.A: DiD-Estimation on Bribe Dummy for Firms with Large Networks

VARIABLES	(1) bribed	(2) govandpublic service	(3) firm	(4) industry and province
CPV	0.239**	0.270*	0.325**	0.0781
	(0.122)	(0.149)	(0.151)	(0.173)
Post Year	0.128	-0.101	-0.387***	-0.111
	(0.0889)	(0.114)	(0.127)	(0.159)
Treated	0.814***	0.718***	0.513**	0.546**
	(0.173)	(0.197)	(0.212)	(0.230)
DiD	-0.438**	-0.677***	-0.559**	-0.520*
	(0.195)	(0.229)	(0.242)	(0.266)
pay_tax		-0.630**	-0.482	-0.390
		(0.282)	(0.298)	(0.353)
policy_inspections		0.123**	0.0659	0.0743
		(0.0557)	(0.0580)	(0.0658)
infrastructure		0.197***	0.116**	0.0540
		(0.0518)	(0.0585)	(0.0663)
sumreg_permits		0.208***	0.141***	0.186***
		(0.0360)	(0.0402)	(0.0467)
ltime_deal		0.0724	0.00483	-0.0344
		(0.0487)	(0.0478)	(0.0575)
size			-0.00410***	-0.00638***
			(0.00143)	(0.00163)
age2			-0.000472*	-0.000437
			(0.000266)	(0.000291)
lphysical_assets			0.0751*	0.109**
			(0.0411)	(0.0503)
lrevenue			0.216***	0.323***
			(0.0565)	(0.0677)
exportd			-0.154	-0.301
			(0.195)	(0.209)
Constant	-0.348***	-1.427***	-5.002***	-6.704***
	(0.0752)	(0.248)	(1.099)	(1.357)
Legal status (4)	No	No	Yes	Yes
Sector (21)	No	No	Yes	Yes
Province (10)	No	No	Yes	Yes
Firm FE	No	No	No	No
Observations	1,107	896	872	872
Number of firmid	860	708	688	688

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Network=1 if firm network size is 3 or more
CPV=1 if respondent is a member of the Communist Party of Vietnam
Post Year=1 if year is after the amendment of the Law on Protection of the Environment
Treated=1 if firm will obtain the certificate in later periods
DiD=Difference-in-difference estimate (Post Year*Treated)

Table B.2.B: DiD-Estimation on Bribe Intensity for Firms with Large Networks

VARIABLES	(1) lbribe	(2) govandpublic service	(3) firm	(4) industry and province
CPV	-0.438	-0.292	-0.382	-0.464
	(0.552)	(0.437)	(0.505)	(0.384)
Post Year	0.180	-0.161	-0.384	-0.132
	(0.330)	(0.411)	(0.457)	(0.420)
DiD	-0.489	-0.420	-0.543	-0.399
	(0.450)	(0.516)	(0.483)	(0.459)
pay_tax		3.511***	4.558***	2.827**
		(1.075)	(1.210)	(1.259)
policy_inspections		0.529***	0.486***	0.451***
		(0.174)	(0.166)	(0.162)
infrastructure		0.0382	0.0683	-0.122
		(0.225)	(0.221)	(0.244)
sumreg_permits		0.0539	0.0969	0.0949
		(0.123)	(0.0858)	(0.105)
ltime_deal		0.291	0.206	0.246
		(0.219)	(0.202)	(0.167)
size			0.0111**	0.0134***
			(0.00496)	(0.00453)
o.age2			-	-
lphysical_assets			-0.00352	-0.207
			(0.167)	(0.201)
lrevenue			0.527***	0.671***
			(0.196)	(0.216)
exportd			-0.209	-0.327
			(0.632)	(0.876)
Constant	8.188***	5.358***	-6.444	-8.215
	(0.164)	(1.566)	(4.865)	(6.285)
Legal status (4)	No	No	Yes	Yes
Sector (21)	No	No	Yes	Yes
Province (10)	No	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	470	418	418	418
R-squared	0.023	0.225	0.367	0.539
Number of firmid	387	350	350	350

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Network=1 if firm network size is 3 or more
CPV=1 if respondent is a member of the Communist Party of Vietnam
Post Year=1 if year is after the amendment of the Law on Protection of the Environment
Treated=1 if firm will obtain the certificate in later periods
DiD=Difference-in-difference estimate (Post Year*Treated)

Main Results Small Networks

Table B.3.A: DiD-Estimation on Bribe Dummy for Firms with Small Networks

VARIABLES	(1) bribed	(3) govandpublic service	(5) firm	(7) industry and province
CPV	0.159	0.120	0.0604	0.00146
	(0.0976)	(0.0970)	(0.0982)	(0.0979)
Post Year	-0.496***	-0.411***	-0.598***	-0.588***
	(0.0533)	(0.0630)	(0.0675)	(0.0695)
Treated	0.631***	0.159	-0.0751	-0.00423
	(0.109)	(0.116)	(0.114)	(0.118)
DiD	0.101	0.0506	0.120	0.0940
	(0.128)	(0.141)	(0.140)	(0.142)
pay_tax		0.310**	0.370**	0.327**
		(0.153)	(0.160)	(0.155)
policy_inspections		0.120***	0.0964***	0.126***
		(0.0346)	(0.0344)	(0.0344)
infrastructure		0.198***	0.133***	0.102***
		(0.0303)	(0.0308)	(0.0314)
sumreg_permits		0.201***	0.0711***	0.103***
		(0.0239)	(0.0259)	(0.0274)
ltime_deal		0.0200	-0.0158	-0.0388
		(0.0282)	(0.0272)	(0.0276)
size			-0.000130	-0.000768
			(0.00134)	(0.00141)
age2			0.000112	0.000186
			(0.000166)	(0.000158)
lphysical_assets			0.0984***	0.0943***
			(0.0213)	(0.0223)
lrevenue			0.141***	0.156***
			(0.0300)	(0.0297)
exportd			-0.152	-0.0951
			(0.122)	(0.121)
Constant	-0.511***	-1.665***	-5.344***	-5.441***
	(0.0485)	(0.157)	(0.620)	(0.621)
Legal status (4)	No	No	Yes	Yes
Sector (21)	No	No	Yes	Yes
Province (10)	No	No	Yes	Yes
Firm FE	No	No	No	No
Observations	4,443	3,225	3,176	3,176
Number of firmid	1,816	1,547	1,542	1,542

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Network=1 if firm network size is 3 or more
CPV=1 if respondent is a member of the Communist Party of Vietnam
Post Year=1 if year is after the amendment of the Law on Protection of the Environment
Treated=1 if firm will obtain the certificate in later periods
DiD=Difference-in-difference estimate (Post Year*Treated)

VARIABLES	(1) lbribe	(2) govandpublic service	(3) firm	(4) industry and province
CPV	0.311	-0.0352	-0.0948	0.0207
	(0.305)	(0.262)	(0.261)	(0.269)
Post Year	0.428***	0.470***	0.191	0.191
	(0.124)	(0.155)	(0.171)	(0.178)
DiD	0.328	0.528*	0.484	0.417
	(0.252)	(0.298)	(0.343)	(0.361)
pay_tax		-0.000393	0.476	0.368
		(0.579)	(0.573)	(0.597)
policy_inspections		0.191**	0.158*	0.176*
		(0.0813)	(0.0835)	(0.0902)
infrastructure		-0.210**	-0.219**	-0.211**
		(0.106)	(0.105)	(0.0992)
sumreg_permits		0.198***	0.147*	0.192**
		(0.0726)	(0.0768)	(0.0838)
ltime_deal		0.0384	0.0487	0.0541
		(0.0775)	(0.0699)	(0.0741)
size			0.00733**	0.00815**
			(0.00325)	(0.00327)
o.age2			-	-
lphysical_assets			0.0860	0.111
			(0.0818)	(0.0870)
lrevenue			0.290***	0.224**
			(0.0840)	(0.0923)
exportd			0.0508	0.119
			(0.464)	(0.497)
Constant	7.362***	7.360***	0.0788	-1.800
	(0.0699)	(0.572)	(1.824)	(1.908)
Legal status (4)	No	No	Yes	Yes
Sector (21)	No	No	Yes	Yes
Province (10)	No	No	Yes	Yes
Firm FE	No	No	Yes	Yes
Observations	1,199	1,042	1,041	1,041
R-squared	0.077	0.116	0.191	0.263
Number of firmid	871	787	786	786

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Network=1 if firm network size is 3 or more
CPV=1 if respondent is a member of the Communist Party of Vietnam
Post Year=1 if year is after the amendment of the Law on Protection of the Environment
Treated=1 if firm will obtain the certificate in later periods
DiD=Difference-in-difference estimate (Post Year*Treated)