



Is Corruption Control Good for All Businesses? The Role of Cash in the Bribery Game

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Abstract. This study investigates the distributional effects of corruption on the performance of cash-rich and cash-poor firms. We propose that cash-bribes are the ultimate objective of corrupt officials. Therefore, firm-level cash-flow is one of the most important determinants of corrupt decisions. Analysing a 15-year (2006-2015) panel of 2.4 million firm-year observations in Vietnam, we find that cash-rich firms gain less benefit and that their performance may even be harmed when corruption controls improve (less corruption-related harassment). By distinguishing administration corruption from negotiation corruption, we aim to explain this paradox.

Keywords: corruption, institutions, firm performance, cash bribe, Vietnam.

JEL-codes: M21; P30; P21

1. Introduction

Corruption is a significant hindrance to economic growth (Fan & Grossman, 2001; Tonoyan et al., 2010). Fighting against corruption is often a long, frustrating, and complicated process with several implicit mechanisms playing simultaneously (Hunt & Laszlo, 2012). Although in general, bringing down corruption is one of the most important factors favouring economic development (Carbonara et al., 2016), in some cases, better corruption controls may negatively affect firm performance and reduce economic growth (De Jong et al., 2012). However, the process of improving corruption controls attracts little research interest. This paper is therefore designed to analyse the dynamics of corruption controls and proposes a mechanism that offers novel insights to the question: “Are better corruption controls always good for firm performance?”.

To answer this question, we suggest a cash-driven corruption hypothesis in which cash is at the centre of corrupt decision-making. Bribery transactions that use cash as a medium of exchange are typically non-traceable and leave little

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evidence behind (De Jong et al., 2012; Goel & Mehrotra, 2012). As such, we propose that firm background characteristics (e.g., type of ownership, age, and size) may be of less importance than firm-level cash-flow in determining officials' corrupt decisions. Specifically, we propose that cash-rich firms (i.e., firms having higher levels of cash-flow in a particular year)², regardless of their type of ownership, firm age, or size, are naturally the ultimate target of corrupt officials.

On that basis, cash-rich firms should gain more benefit when corruption controls improve (i.e., when there is less corruption-related harassment). However, there is an alternative scenario in which cash-rich firms might gain *less* benefit from or even be *harmed* by improved corruption controls. This paradox originates from the nature of corruption. This, according to Husted (1994), can be generally classified into two types: (1) administration (bureaucratic) corruption; and (2) negotiation corruption. The former is explicit and observable, in that specific values of bribe prices are affixed to simple and well-structured public services. The latter is more implicit, encompassing negotiated deals with local authorities, which occur when firm activities/investments fall outside the existing regulations and require accommodating decisions by local officials (Fries et al., 2007; De Jong et al., 2012).

In developing countries, at the initial phase of the fight against corruption, governments usually keep their eyes largely on administration corruption (Efendic et al., 2015; Husted, 1994). This type of corruption is relatively easy to deal with and attracts more attention from the public (Gueorguiev & Malesky, 2012). In contrast, negotiation corruption, which involves larger bribe values and more severely corrupt behaviours from higher levels of authorities, usually receive little interest at the outset of corruption control (Nguyen et al., 2018). This leads to a situation in which corrupt officials are incentivised to raise bribe prices in negotiation deals to make up for the losses induced by the increasingly stringent controls over administration corruption. As long as corrupt officials perceive that the cost of getting caught remains insignificant, they will continue to raise negotiation bribe prices. Meanwhile, cash-rich firms are more active in economic activities that might require some form of negotiation with local authorities. For example, they make larger, longer-term, and higher value-added investment projects (e.g., R&D), or even create new businesses and industries (Bond & Meghir, 1994; Guariglia & Liu, 2014). Therefore, they inevitably become the target of the increased negotiation corruption.

We test the cash-driven incentive hypothesis using a large and representative dataset of more than 2.4 million firm-year observations in Vietnam from 2006 to 2015. By examining the distributional effects of corruption on cash-rich and cash-

2. In this study, 'cash-rich firms' indicates firms that have better cash-flow performance than their peers in the same industry in a particular year; and 'cash-poor firms' indicates firms that have weaker cash-flow performance than their peers in the same industry in a particular year.

poor firms, this study makes important contributions to the extant literature in the following ways:

First, we propose a novel mechanism to explain the nature of corrupt decisions. It is well understood that corruption is a kind of informal charge, which requires a non-traceable and undiscoverable method of transaction (Hunt & Laszlo, 2012; Nguyen & Van Dijk, 2012). Considering the matter from this viewpoint, we propose a model that examines cash-driven corrupt decisions. This model stands in sharp contrast to a large body of literature that investigates the effects of corruption on small versus large firms and state-owned versus non-state-owned firms (Du & Mickiewicz, 2016; Nguyen et al., 2018). We, however, argue that when cash drives a corrupt decision, the characteristics of the firm become redundant since officials may take the view that the costs of taking cash-bribes (i.e., the risk of getting caught) from firms of any type are similar, so long as the bribery transactions remain undiscovered.

In addition, this study provides important insights into the dynamics of corruption controls. While the nature of corruption and its consequences on firm performance have been widely investigated, the process through which corruption controls gradually improve, and the influence of this on firms with different levels of cash-flow remain largely unexplored. We provide a theoretical framework and a set of empirical evidence to show that an improvement in corruption controls may increase rather than reduce the burden of bribery for cash-rich firms. This is particularly the case in the developing countries, where the fight against corruption has just begun (Aidis et al., 2012). We propose that the process of fighting corruption is more complicated than might at first be expected, and the assumption that corruption controls are invariably positively associated with firm performance is naïve. By addressing the heterogeneous effects of corruption, this study has meaningful implications for policymakers who seek a better understanding of corruption and the methods of controlling it.

The set-up of this paper is as follows. Section 2 provides a theoretical background and derives hypotheses. Section 3 describes the research context, i.e. the contemporary Vietnamese economy. Section 4 deals with the data sources and methods, while Section 5 presents the results of the empirical analysis. Finally, Section 6 provides a discussion and the conclusions of the paper.

2. Theoretical Background and Hypotheses

2.1. Corruption as a Mismatch of Institutions

Corruption originates from the mismatch between institutional forces (Márquez et al., 2011; Nguyen et al., 2018). Institutions are artificial “rules of the game”, established to reduce uncertainty and transaction costs (Williamson, 2000).

Employing the mechanism of reward and punishment, institutions can steer the behaviours of economic agents in the desired direction (i.e., good behaviours). In general, institutions, or the “rules of the game”, may be formal (e.g., laws and regulations) or informal (e.g., customs and traditions). However, a set of well-structured “rules of the game” will be ineffective without appropriately supportive governance arrangements (or the “play of the game”) which encompass the execution and implementation of the pre-set rules at local government level (Elert & Henrekson, 2017).

Corruption harms an economy in several ways. First, it encourages (legitimises) rent-seeking activities, e.g., bribery, gift-giving, and actions aimed at entertaining officials (Du et al., 2015). These activities distract entrepreneurs from management tasks and may crowd out other productive activities (e.g., investment). This harassment type of corruption is particularly evident when firms come under the notice of corrupt officials. Second, corruption is not a trivial financial burden for the companies participating in the bribery game (Gueorguiev & Malesky, 2012). From the accounting viewpoint, payments for bribery transactions and other types of corruption are eventually recorded as company expenses. This increases the company’s product prices and reduces its competitive advantages. The extant literature has it that large private companies are more likely to be affected by corruption as they are firmly on the screening radar of politicians and administrators. The reason being that corrupt officials have their own time and attention constraints and, as such, larger transactions will appear more attractive to them than smaller ones (Du & Mickiewicz, 2016). Corruption is a typical example of the mismatch between the “rules” and the “play” of the institutional game (Charron et al., 2014; Koyuncu et al., 2010). Specifically, corruption is the misuse or abuse of power, conducted by government officials to gain private benefits (Jain, 2001). Corruption is particularly prevalent in contexts where the formal institutional frameworks are weak and underdeveloped. In such environments (developing countries), the local authorities have substantial room to interpret and manipulate the regulations and policies for their own private gain rather than in furtherance of social benefits.

In addition, corruption is harmful because of the vicious circle created by the participants in the bribery game. From the supply side of corruption, entrepreneurs understand that bribery transactions are accompanied by unpredictable outcomes since there can be no explicit written contracts (Anokhin & Schulze, 2009). Since the *ex-post* transaction costs – the costs of monitoring officials after the payment – are relatively high, entrepreneurs are thus willing to pay extra *ex-ante* money to reduce the potential risks of hold-ups, as well as to gain priority over the list of similar bribers (Murphy et al., 1993). From the demand side of corruption, officials are keen to raise their bribe price after each successful transaction. The reason for this is that as long as the transactions go undiscovered, the perceived cost of them making a slightly bigger deal (i.e. the risk of being caught) is relatively unchanged. As such, larger bribery deals always

appear more appealing to them. In general, the combination of the aggressive expectation from the demand side (corrupt officials), and the willingness to pay from the supply side (entrepreneurs) gives rise to a vicious circle, in which corrupt officials have reasonable incentives to gradually upgrade the minimum value of bribery transactions.

Moreover, the vicious circle of corruption may also attract more players into the game. Tonoyan et al. (2010) argue that the probability of entrepreneurs participating in corrupt activities partially depends on the level of corruption legitimacy prevailing in an economy. Because the distinction between the perception of *popularity* and *acceptancy* is relatively opaque (Baron, 2007; Mitchell et al., 2002), when corruption is increasingly prevalent, it is at the same time gradually legitimised, that is, it becomes perceived to be an acceptable activity according to the local norms of doing business.³ As a result, in each circle the players of the game will re-rationalise their participation in bribery transactions based on the updated value systems and ethical criteria, which become more and more deteriorated and corruption-friendly. As its legitimacy increases, this vicious circle of corruption has the power to attract more participants with even fewer scruples (Acemoglu & Johnson, 2005).

2.2. Corruption and Cash

Corruption has heterogeneous effects on different types of businesses (Hunt & Laszlo, 2012). The extant literature shows that large companies bear unproportional burdens of corruption harassment in comparison to smaller companies. However, large companies are not always in a position to be able to satisfy the increasingly higher-value bribes required by corruption. It is noteworthy that *cash* is the ultimate objective of corrupt officials and that the companies that are large in terms of their asset-values do not necessarily have better cash-flow than small companies (Guariglia & Yang, 2016). This is something that local officials with tax information and “back-door” relationships will be aware of, and they can easily identify which firms are rich in cash that year and which firms are not (Du & Mickiewicz, 2016). To minimise their transaction costs, corrupt officials will aim to target their efforts towards companies that are cash-rich even if they are small in terms of their fixed assets. Therefore, we suggest that the distributional effects of corruption on firm performance may be a function of firm-level cash-flow rather than of the size of their assets. Further, by saying this, we highlight the dynamics of corruption decisions. A firm may be a target of local officials one year but may escape attention the following year if

3. Ivanovic-Djukic et al. (2019) report that, for a sample of Serbian entrepreneurs, almost 60% of them admitted to have used some form of corruption when they started their own business.

their cash-flow reduces. As such, we propose that the appropriate unit of analysis should be firm-year rather than firm.

In line with this strand of argument, when corruption controls improve (less corruption-related harassment), cash-rich firms should feel the benefit more than cash-poor firms. However, there is a possibility that corruption controls may worsen the performance of cash-rich firms. This paradox can be explained using the model of two types of corruption (Efendic et al., 2015). Specifically, administration (bureaucratic) corruption refers to the fixed values of bribes paid for routine public services while negotiation bribery is the unfixed (negotiable) values of bribes paid for official approval of activities that are relatively important to companies but fall outside the existing regulations, therefore requiring accommodating decisions by local officials (Husted, 1994).

Given this duo-market of bribery, if corruption controls are implemented only at the level of administration corruption, cash-poor firms will gain more benefits because they are more financially constrained (Carreira & Silva, 2010). As such, they are likely to conduct small investment projects, which typically come under the remit of routine administration procedures and well-established public services where the bribe values are pre-set (De Jong et al., 2012). When corruption controls improve, officials will avoid getting involved in administration corruption because the risks of getting caught now outweigh the benefits of taking this type of bribe.

However, officials may decide to make up their financial losses by increasing the price of the negotiation bribes. There are two reasons underlying this decision. First, corrupt officials, due to their long-held belief in what constitutes a “fair” transaction, will be impelled to seek income from elsewhere if the usual source has dried up. Thus, when administration corruption is closely monitored, negotiation corruption will appear to be the solution to maintaining their informal incomes. Since corruption is a sticky norm (Estrin et al., 2013), corrupt officials have a strong motivation to resist any deviation from what they perceive to be legitimate practices. Moreover, the practice is also concerned with their financial income. Because corruption norms are institutionalised (highly embedded) in the local conventions of doing business, corrupt officials are keen to maintain the logics and beliefs of what has always been seen as a “fair” transaction (i.e., a transaction *with* a bribe). When corruption controls are tightened, officials face a new set of institutions (rules) that are contradictory to their old regime of beliefs. This institutional complexity triggers a decoupling strategy, in which conforming to the new rules (i.e., conducting transactions *without* bribes) is ceremonial rather than substantive (Raynard & Greenwood, 2002). This issue is particularly prominent in the case of post-communist developing countries where the forces arrayed against any change to the old regime of beliefs are substantial and strong (Dana, 1994). As such, we propose that to cope with the new “rules”, officials will stop extracting administration bribes. However, since their belief about what

constitutes a fair transaction is unchanged, they may increase the price of the negotiation bribes.

Second, the strategy of charging higher negotiation bribe prices to make up for the loss of administration bribes is underpinned by the fact that negotiation bribes are less likely to be discovered in comparison to the explicit bureaucratic bribes, thus they are “safe” for corrupt officials to conduct. Moreover, officials may feel even safer during the initial phase of the fight against corruption when governments largely focus on reducing the relatively explicit administration corruption, such controls being measurable and reportable to the public (Anokhin & Schulze, 2009). Because achieving improvements in controlling corruption is politically essential at the beginning of the fight, governments will mostly focus on administration corruption to demonstrate that their controls are effective (Charron et al., 2014). In addition, more people will perceive the effect of a reduction in bureaucratic corruption because this type of corruption is widespread and experienced by many types of social agents (Tonoyan et al., 2010). Negotiation corruption, on the other hand, is *perceived* as less relevant because it does not affect firms that do not undertake activities that require negotiated approval (Efendic et al., 2015). As such, administration corruption may attract more resources from the government and attention from the public, leaving considerable room for negotiation corruption to continue unabated or even exacerbated.

When negotiation bribe prices rise, cash-rich firms will be more affected than cash-poor firms. The reason being that cash-rich firms are less financially constrained and more active in complex economic activities (Ding et al., 2013). As such, they are more likely to make investment projects that require negotiations with officials (e.g., mergers and acquisitions, or opening a new industry). These large-scale or unconventional projects are likely to be subject to higher prices of negotiation bribes, especially when administration corruption is prohibited. Consequently, we suggest the following hypothesis:

Hypothesis H1: In Vietnam, the positive association between corruption controls and individual firm performance will get weaker when the firm's level of cash-flow increases.

2.3. Corruption, Cash and Types of Firms

The extant literature has documented that non-state-owned firms suffer from more frequent bribery irritations than state-owned firms. Similarly, large private companies face higher bribery demands from corrupt officials than small businesses (Du & Mickiewicz, 2016). However, once the model takes into account the role of cash-flow, we expect that firm background characteristics

such as ownership and firm size may in fact be redundant to the decision-making process of rent-extracting officials.

Because bribery transactions that use cash are typically untraceable and leave little evidence concerning the existence of the deal, officials automatically home in on cash-rich companies. In this screening process, the factors of ownership and firm size may have little effect on corrupt decisions for two reasons. First, officials believe that cash-based bribery transactions are non-traceable, and they are aware that the bribers will take every step to ensure that information about their activities is not leaked to outsiders (Hunt & Laszlo, 2012). As such, officials are not much concerned about the risk of getting caught. Given this perception of “safe deals”, officials believe that the risks of discovery are similar for all types of firms regardless of their type of ownership and firm size.

Second, foreign and large companies are not necessarily always cash-rich in comparison to their smaller counterparts. Entrepreneurial ventures that are not large in terms of fixed assets but which have effective business models may be able to generate substantial cash-flow. Thus, officials who target foreign and large firms may not always obtain the desired value in bribes. Meanwhile, cash-rich firms (regardless of their background characteristics) that are active in economic activities and likely to become involved in public administration procedures (e.g., applying for business licences), may serve as a more “sustainable” source of bribe supply.

In general, when corruption controls are initially being implemented and administration corruption is being closely monitored, negotiation corruption can become an alternative source of informal income for corrupt officials. Cash-rich firms, regardless of their background characteristics, may therefore face a heavier burden of corruption demand. In other words, firms of all types of ownership and size have an equal chance of becoming the target of corrupt officials as long as in a particular year their cash-flow performance surpasses that of their peers. Consequently, we propose the following hypothesis:

Hypothesis H2: The negative moderating effect of cash flow on the relationship between corruption controls and firm performance (proposed in H1) holds across all types of firm ownership and across all firm size-classes.

3. Vietnam as a Context

The empirical setting in this study is Vietnam. The country is an interesting context for an examination of the impact of corruption on firm performance due to its post-communist political ideology and its ongoing economic transition to a communist-oriented market economy. This form of economy aims to develop multi-sectoral markets (i.e., with a state sector and a private sector), in which the state sector plays a decisive role in directing economic development, with the

eventual long-term goal of achieving socialism (Dutta, 1995; Montes, 1995; Vidal Alejandro, 2016).

The process of transitioning from a post-communist to a socialist economy is inevitably accompanied by weak institutions and poor governance quality (Hanh, 2011). Moreover, the governance quality across regions in Vietnam varies significantly due to the impact of history (Mirza & Giroud, 2004). While North Vietnam followed the pure socialist blueprint from its outset, South Vietnam was only transformed from capitalism to socialism in 1975. This historical event gives rise to the differences in local informal institutions across Vietnam's regions (Makino & Tsang, 2011). Moreover, according to the institutional theory, these differences are expected to persist in the local norms of doing business, despite the unification of the two states four decades ago, which promulgated a single formal institutional framework throughout the country.

In addition, this variation in informal institutions (that include corruption norms) is also partly due to the extensive decentralisation program during the *Doimoi* (economic renovation). The foundation of this program was the promulgation of the 1996 (revised in 1998) State Budget Law, which grants considerable autonomy to local authorities in deciding their fiscal strategies. Specifically, local authorities are fairly independent of the central government in their revenues and expenditures. Moreover, they have substantial power to determine their local governance and regulatory arrangements.

Nguyen (2017) suggests that despite Vietnam's phenomenal economic transition, its growth momentum is dwindling because of the braking effects that have originated from a high degree of corruption. De Jong et al. (2012) argue more specifically that bribery activities and productive activities in Vietnam must compete for a limited pool of cash, which will inevitably lead to a reduction in efficiency.

The fight against corruption in Vietnam is, however, still faltering (Dang, 2013; Malesky et al., 2015). The intrinsic values of communism, including common ownership, collectivism, and the state-owned economy give rise to the formation of a bureaucratic government structure. Meanwhile, because the "rules" (formal institutions) are underdeveloped and incomplete, local authorities have substantial room to "play" the institutional game to further their private ends. This misalignment between the "rules" and the "play" is even greater because there are insufficient monitoring schemes to control local authorities' corrupt behaviours (Nguyen et al., 2018).

4. Data and Method

4.1. Data

We test the proposed hypotheses using a combination of two datasets. The first is the Enterprise Annual Survey conducted by the Vietnam General Statistics Office (GSO). It is a sixteen-year panel from 2000 to 2015 that includes firm-level information about the investment, performance, financial, and ownership structures of firms in the manufacturing and service sectors. However, the time-period in this study is reduced to ten years, from 2006 to 2015, to correspond with the availability of the second dataset, the Provincial Competitiveness Index (PCI)⁴, which was first conducted for a sample of regions in Vietnam in 2005 and then for all 63 provinces from 2006. The dataset is a product of the collaboration between the Vietnam Chamber of Commerce (VCCI) and the U.S Agency for International Development (USAID). Generally, PCI is an overall provincial competitiveness index, depicting a weighted average of nine sub-indices, including corruption controls. The definitions and summary statistics of the indices are presented in Appendix 1.

4.2. Variables and Summary Statistics

To clean the data, firms with meaningless accounting reports are excluded. The outliers are controlled for by censoring the top and bottom 1% of observations in each variable. In this study, we keep all registered businesses as our population of interest; this includes micro-firms, small and medium-sized companies, as well as large corporations from all ownership sectors (i.e. state-owned, privately-owned and foreign-owned). The final sample constitutes 2,431,081 observations over 10 years. Details about the panel structure of our data are reported in Appendix 2.

Following the convention in the literature (Du & Mickiewicz, 2016), we measure firm performance using gross earnings before interest and tax (EBIT). The gross *profit* variable is the ratio of EBIT over total capital. We use profit rather than revenue to measure firm performance because profit can better capture the effects of corruption. It is noteworthy that bribes amount to expenses and so they are likely to affect firm profits rather than revenues. Alternative measures of performance are also investigated in the robustness check section.

4. PCI is a rigorous survey of more than 10,000 domestic firms and 1,700 foreign invested enterprises. The survey deals with the local institutional environment and governance quality across the provinces in Vietnam. From 2013, there is an additional sub-index, Policy Bias. For details of the items measured in each indicator, the methodology, and information about data collection please visit www.eng.pcivietnam.org.

We measure corruption control using the PCI dataset. The *Corruption controls* variable takes the score values of the Corruption controls index, which ranges from 1 to 10; the higher the score, the better the corruption controls (i.e., there is less corruption-related harassment). The corruption controls index is a measure of how much firms pay in bribery, how much of an obstacle those extra fees pose for their business operations, and whether officials use compliance with local regulations to extract rents.

To measure the levels of cash-flow, we use a *Cash* variable, which is the ratio of cash-flow over total capital. Firms with insufficient cash to support their operations typically face liquidity problems. This unhealthy financial situation may reduce productivity and efficiency, leading to sub-optimal performance (Guariglia & Poncet, 2008). Meanwhile, firms that maintain an appropriate level of cash-flow are able to smooth their operations, improve efficiency, and achieve better performance. As such, we expect a positive association between the level of cash-flow and profitability. However, it is noteworthy that too much cash may signal inefficiency in allocating resources (e.g., insufficient investment in long-term assets) (Becchetti et al., 2010).

Following suggestions from previous studies, we include a set of covariates that may influence firm profitability. First, at the firm-level, we include firm age, size, industry, and types of ownership. These variables represent market shares and firm-specific competitive advantages, which play an essential role in determining profitability (Du & Mickiewicz, 2016). Second, at the entrepreneur-individual level, we include owner age, which is a proxy of education, experience, and the accumulated social capital of entrepreneurs (Nguyen, 2019). These factors may affect entrepreneurs' ability to recognise patterns, which is an antecedent of the ability to identify and evaluate business opportunities. Third, at the region-level, we include provincial population density and provincial average consumption value per capita as a proxy for local consumption power; we also control for labour force (as a ratio of the number of working age people over the total population) since the availability of human resources is an important factor for production and performance (Cooke & Lin, 2012). Finally, we include the distance from a province to the closest municipality (business and political centres) as a proxy for interaction among regions, which may also influence local firm performance (Driffield et al., 2013).

The variable definitions and summary statistics are reported in Table 1. In general, the average firm size, which is 46 employees, and the average firm age, which is 6.6 years old, indicate that Vietnam is a typical entrepreneurial economy. More than 90% of the total registered firms are private, 7% are state-owned, and only 3% are foreign-owned firms. In terms of financial variables, the average profit is 1% of total capital, and the average cash-flow value is 3% of total capital. Finally, a pairwise correlation matrix is presented in Appendix 3. The correlation coefficients show that there are no serious issues with multicollinearity among the independent variables.

Table 1: Variable Definitions and Summary Statistics

Variable	Definition	Mean	SD	Min	Max
Gross profit	The ratio of EBIT over total capital times 100 (i.e. expressed as a percentage).	1.10	10.88	-58	40
Corruption controls	Value of the corruption index. The indicator ranges from 1 to 10; the higher the score, the better the corruption controls.	6.14	1.48	1.40	9.62
Cash	Ratio of cash-flow over total capital	0.036	0.15	-0.66	0.62
Firm age	Years of operation since establishment	6.62	5.68	1	68
Firm size	Natural log of the number of employees (reported by the number of employees)	46.18	366.48	1	86,669
State	Takes value 1 for state-owned firms, 0 otherwise	0.065	0.25	0	1
Private	Takes value 1 for private firms, 0 otherwise	0.91	0.29	0	1
Foreign	Takes value 1 for foreign-owned firms, 0 otherwise	0.025	0.18	0	1
Owner age	Age of the owner of the firm	43.71	9.97	24	69
Distance	Distance from a province to the closest business centre, in km	77.55	118.08	1	499
Density	The ratio of population over area by province, in thousand persons per km ²	1.833	1.365	0.039	3.888
Consumption	The (real) average annual consumption value in 2010 prices, in million VND per capita	37.16	23.84	1.11	89.12
Labour	The ratio of working age population over total population by province	0.55	0.04	0.45	0.79

Note: The number of firm-year observations is 2,431,081, measured over the period 2006-2015.

4.3. Empirical Model and Estimation

Following the literature examining firm profitability (Du & Mickiewicz, 2016; Nguyen et al., 2018), we propose a reduced-form function as follows. This is our benchmark specification:

$$Profit_{igt} = \beta_0 + \beta_1(Firm_{igt}) + \beta_2(Owner_{igt}) + \beta_3(Province_{gt}) + \beta_4(Corruption\ controls_{gt}) + \beta_5(Cash_{igt}) + \beta_6(Cash_{igt} \times Corruption\ controls_{gt}) + v_j + v_t + v_i + \mu_{it}$$

where i denotes an individual firm, g is the province, and t a year. As such, $(Profit_{igt})$ is the gross profit that firm i in province g makes in year t . The term $(Firm_{igt})$ is a column vector of firm-level control variables, namely firm age, firm size, and type of ownership dummies; the term $(Owner_{igt})$ is the owner age control variable; $(Province_{gt})$ constitutes the control variables of consumption per capita, population density, labour force, and distance to the closest business centre. The term $(Corruption\ controls_{gt})$ is the score of corruption controls at the provincial level; and $(Cash_{igt})$ is the ratio of cash-flow to total capital. The profit function also includes an industry-specific component v_j , and a time-specific component v_t , which are controlled by corresponding dummies. The term v_i represents all

time-invariant, firm-level fixed effects that may influence profit performance. Finally, μ_{it} is the idiosyncratic error term.

We are interested in the coefficient of β_6 because it indicates the interaction between corruption controls and cash-flow. A positive coefficient implies that cash-rich firms benefit more from corruption controls. In contrast, a negative coefficient indicates that cash-poor firms benefit more from corruption controls. The expected sign of β_6 is negative, in line with hypothesis H1.

To test the proposed hypotheses, we first run a lump-sum regression on the entire sample; then we run a set of individual regressions on different types of ownership and firm size. In terms of firm size, we employ the Vietnam Enterprise Law to classify firms as micro-firms, SMEs, and large firms.⁵ All equations are estimated using a fixed effect panel estimator, corrected by robust standard errors clustered on firm and province per year. To control for potential endogeneity, all independent variables that may suffer from the reverse effect are lagged one year, including firm size and cash-flow. Moreover, Tran and Santarelli (2014) argue that development of the private sector may exert pressure on local authorities to improve local institutions and governance quality, which may be a source of endogeneity (reverse effect). As such, we also lag the corruption variable by one year. The fixed effect estimator could deal, to some extent, with unobservable heterogeneity in the model. It is worth noting that firm-level attributes, industrial sector, and time-invariant regional characteristics are already controlled for by the fixed effect. Hausman tests are conducted to check the endogeneity of the fixed effect as well as to confirm its appropriateness over the random effect. Finally, VIF tests are used to check multicollinearity in all specifications.

5. Results

The main regression results are reported in columns 1 and 2 in Table 2. The test statistics reveal no significant issues with the model specifications. In particular, the Hausman test indicates the appropriateness of the fixed effects over the random effects. Also, the VIF statistics in all specifications are lower than 10, the conventional threshold above which concerns may be raised about the existence of multicollinearity among the independent variables.

5. According to the Vietnam Enterprise Law, there are four types of firm size. Micro-enterprises are firms operating with fewer than 10 employees. Small enterprises are firms that have 10 to 200 employees and total registered capital of less than 20 billion VND (approximately 1 million USD). Medium enterprises are firms with 200-300 employees and total registered capital of less than 100 billion VND (approximately 5 million USD). Finally, large enterprises are firms that have more than 300 employees and 100 billion VND registered capital. Capital is the first criterion in categorisation.

Table 2: Regression Results by Ownership Type and Firm Size-class

	Total sample	Total sample	State-owned	Private	Foreign-owned	Micro	SMEs	Large
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash	52.4274*** (0.1510)	78.1299*** (1.0614)	35.0344*** (3.5744)	81.3176*** (1.1279)	113.9845*** (2.8263)	86.6605*** (1.5707)	72.0916*** (1.6334)	54.1023*** (3.6527)
Corruption controls	0.0871*** (0.0159)	0.3009*** (0.0175)	0.2777*** (0.0900)	0.2786*** (0.0178)	1.0414*** (0.1406)	0.2912*** (0.0245)	0.3033*** (0.0318)	0.4178*** (0.0989)
Cash × Corruption controls		-4.0294*** (0.1639)	-0.6740 (0.5522)	-4.0987*** (0.1712)	-8.4419*** (0.4207)	-3.7591*** (0.2388)	-4.3854*** (0.2452)	-3.7553*** (0.5315)
Firm age	-2.4890*** (0.0549)	-2.4247*** (0.0546)	-1.3759*** (0.1858)	-2.2775*** (0.0555)	-4.9484*** (0.3239)	-2.4230*** (0.0867)	-2.1813*** (0.0904)	-1.5548*** (0.2546)
Firm size	0.1041*** (0.0140)	0.1027*** (0.0140)	0.3166*** (0.1013)	0.0408*** (0.0137)	2.1409*** (0.1410)	-0.1784*** (0.0232)	0.5008*** (0.0230)	0.4445*** (0.0652)
State-owned	1.9937*** (0.2191)	2.0517*** (0.2208)				0.7457 (0.7297)	0.9827*** (0.3001)	0.8918*** (0.3228)
Foreign-owned	-0.1008 (0.4852)	-0.1046 (0.4781)				-0.4621 (0.8795)	1.1805 (0.8862)	0.2382 (1.0015)
Owner age	0.5431*** (0.0541)	0.5146*** (0.0537)	-0.0122 (0.1821)	0.4407*** (0.0545)	1.2694*** (0.3118)	0.6003*** (0.0854)	0.3900*** (0.0890)	-0.0751 (0.2433)
Distance	0.0163*** (0.0021)	0.0132*** (0.0021)	-0.0048 (0.0043)	0.0126*** (0.0020)	-0.0054 (0.0129)	0.0201*** (0.0056)	-0.0039 (0.0048)	-0.0009 (0.0035)
Population density	0.9550*** (0.0677)	0.6863*** (0.0681)	-0.2907 (0.3144)	0.7614*** (0.0691)	-1.4210*** (0.4689)	1.3537*** (0.1123)	-0.0423 (0.1076)	0.1726 (0.2609)
Average consumption	0.0512*** (0.0021)	0.0444*** (0.0021)	-0.0378*** (0.0099)	0.0382*** (0.0021)	0.0201 (0.0163)	0.0370*** (0.0031)	0.0063* (0.0035)	0.0255*** (0.0096)
Labour force	-2.6014*** (0.6466)	-2.3415*** (0.6466)	-6.3445** (3.1093)	-1.3900** (0.6525)	4.9093 (4.3323)	0.2158 (1.0148)	-5.6550*** (0.9955)	-4.2013 (3.1131)
Hausman p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
VIF	2.76	7.34	7.39	8.13	6.27	7.22	8.11	7.56
Observations	2,431,081	2,431,081	169,836	2,212,049	49,196	1,522,340	831,139	77,602
R-squared	0.752	0.753	0.694	0.761	0.832	0.815	0.746	0.778

Note: The dependent variable is gross profit as a percentage of total capital. The results reported were estimated using the fixed effect panel estimator controlling for the multi-level structure of the data. All specifications include full sets of 2-digit industry dummies and 10 year dummies. The variables firm size, cash, corruption, and their interaction terms are lagged one year. The reference ownership type is the private sector. The figures reported in parentheses are robust standard errors. Hausman test statistics are reported for the endogeneity of fixed effects. VIF tests are reported for multicollinearity. *** indicates significant at 1%, ** indicates significant at 5%, and * indicates significant at 10%.

The coefficients associated with the cash and corruption control variables are all positive and statistically significant, indicating that firms with better cash-flow or firms located in regions with better controls for corruption are more profitable than firms with insufficient cash-flow or firms located in severely corrupted regions. In column 1, for example, the coefficient associated with the cash variable is 52.43, indicating that when cash-flow increases by one percentage point, gross profit will rise by 0.52 percentage point. Meanwhile, the coefficient associated with the corruption control variable is 0.087, indicating that when the index improves by 1 point, gross profit will rise by 0.087 percentage point. Given that the mean profit is 1.10 percent (see Table 1), such an increase in corruption control of 1 point is associated with an increase in profits of 8% for the average firm (i.e. $0.087/1.1$).

Importantly, the coefficient associated with the interaction term of cash and corruption controls is negative and statistically significant (column 2). The negative sign indicates that as cash-flow increases, the effect of corruption controls on profitability reduces. In other words, the richer the firms are (in terms of cash-flow), the *less* benefit they enjoy from improved controls of corruption. This suggests that corruption controls in Vietnam are still at the administration level, which is less relevant for cash-rich firms. This finding, therefore, supports hypothesis H1. The regression estimates in column 2 suggest that, when the level of cash-flow rises above 0.075 (i.e. $0.3009/4.0294$), or 7.5% of total capital, the effect of improved corruption controls on firm profitability even turns negative (note that the average level of cash-flow is 0.036, or 3.6% of total capital; see Table 1).

Table 2 also shows the regression results on ownership types (columns 3, 4, and 5) and firm size-classes (columns 6, 7, and 8). The insignificance of the interaction term in the state-owned firm specification indicates that corrupt officials are only indifferent about whether firms are cash-rich or cash-poor if the firms belong to the government. However, it is noteworthy that corruption controls remain a statistically significant determinant of SOEs' profitability. As such, we suggest that the distributional effects of corruption controls on state-owned companies may follow a mechanism other than the pattern of cash-flow.

Except for SOEs, the distributional effects of corruption controls on other types of ownership and firm size-classes strongly follow the levels of cash-flow. Specifically, a higher level of cash-flow is associated with a weaker effect from corruption controls. As such, hypothesis H2 is partly supported when types of ownership are considered (to the extent of private and foreign ownership), and fully supported when firm size-classes are considered. In terms of the economic effects, the coefficients associated with the interaction terms in the foreign-owned firm specification is twice as large as it is for the private firm specification (the coefficient is (-8.44) in column 5 compared to (-4.10) in column 4). This result is interesting in that foreign-cash-rich firms are more sensitive to corruption controls than domestic-cash-rich firms, despite several policies introduced by

central government that are intended to protect foreign firms with the aim of attracting FDI (foreign direct investment) (Dang, 2013).

In terms of the control variables, the coefficients associated with firm age are negative and statistically significant in all specifications. However, the effect of firm size is the opposite: firms improve their gross profit when they become larger. These findings are consistent with the literature arguing that older firms may lose their initial entrepreneurial spirit, leading to reduced performance (Du & Mickiewicz, 2016). However, if firms overcome this tendency and grow larger, they can accumulate the necessary resources to improve their profitability.

Regarding firm ownership, the results in columns 1 and 2 show that state-owned firms are more profitable compared to private firms. Foreign firms, however, appear to earn less profit than domestic private firms, although the difference is not significant. These findings indicate that state-owned firms, thanks to their access to abundant resources and privileges, are able to achieve better performance (Van Thang & Freeman, 2009). Meanwhile, foreign-owned firms, due to the liability of being ‘outsiders’, have not gained competitive advantages in the Vietnamese markets. Owner age is positively related to firm profitability, pointing at the role of accumulated human capital.

In terms of provincial-level control variables, population density and consumption power are positively associated with firm profitability, indicating benign circumstances for running a business due to a higher demand for products and services by the local population. However, the labour force variable is negatively associated with profitability. This finding may indicate that regions abundant in labour supply are usually relatively competitive (i.e., large business centres), which leads to lower profit margins on average for firms operating in these regions. This negative effect of competition is also demonstrated by the positive association between the distance variable and firm profitability: firms located further from the large business hubs are more profitable, possibly because they experience less local competition.

To check the robustness of the results, we also examined the distributional effects of corruption controls using other financial measures, including net profit and asset growth. Net profit is earnings after tax. This variable captures the effect of corruption in taxation procedures. Meanwhile, asset growth measures the percentage change of fixed assets between two consecutive years. The higher the increased value of fixed assets, the more likely it is that firms will need to deal with negotiation corruption. In general, the findings using these two dependent variables as measures of firm performance are consistent with those reported above and indicate that cash-rich firms benefit *less* from corruption controls. These regression results are available upon request.

6. Discussion and Conclusion

This study examines the distributional effects of corruption on cash-rich and cash-poor firms. Standing in sharp contrast to the conventional literature, this article aims to explain how corrupt decisions are made based on cash-driven incentives. We propose that cash is the ultimate objective of corrupt officials. Cash transactions are non-traceable and leave little evidence of the existence of the bribes. Because of this specific attribute, cash-flow may crowd out other factors, such as firm ownership and firm size, when corrupt officials select their targets.

In fact, our empirical evidence suggests that state-owned firms are the only cash-rich companies that can remain below the screening radar of corrupt officials. Koyuncu et al. (2010) propose that state-owned firms in post-communist economies play different games to the local private firms. They may be established for political rather than economic purposes; some state-owned firms even receive unofficial political back-up from central government (Xue, 2013). Although findings suggest that the mechanism of cash-driven incentives does not apply to state-owned companies, we suspect that there is another mechanism that does apply to them because the coefficient associated with corruption controls is (also) positive and statistically meaningful in the state-owned firm specification. Therefore, future research could explore other distributional patterns of corruption on state companies.

More importantly, in contrast to the naïve expectation that controlling corruption will be of blanket benefit to firms, we find that corruption controls actually lay a heavy burden on cash-rich firms. These firms not only gain less benefit from anti-corruption measures than their cash-poor counterparts, but their profitability may even be harmed when corruption controls improve. This counter-intuitive finding requires us to have a closer look at the nature of corruption. When administration corruption controls improve and negotiation corruption controls do not, cash-rich firms will find that officials become more aggressive when negotiating bribe prices. This phenomenon is likely to occur in the initial phase of the fight against corruption in developing countries.

By focusing on examining cash-driven incentives, this study provides several meaningful insights on the distributional effects of corruption. Du and Mickiewicz (2016) and Nguyen et al. (2018) suggest that there are uneven playing fields for firms with different types of ownership, firm size, and age when corruption exists. This paper expands the argument by showing that the cash-driven motive of corrupt officials is not only relevant but is probably the most important factor leading to the establishment of uneven playing fields for economic players.

This study provides several implications for policymakers. Specifically, we suggest that it is important for governments to balance administration corruption controls and negotiation corruption controls. Unfortunately, since administration

corruption is relatively easier to handle than negotiation corruption, policies targeting administration corruption usually attract more attention and resources from government and the local communities. As a result, the fight against the hidden but arguably more important negotiation corruption receives disproportionately little interest. But because of this, governments ought not to expect or claim that corruption controls enhance economic performance if they focus only on dealing with administration corruption (De Jong et al., 2012). In fact, for some (cash-rich) firms, firm performance may even be harmed when corruption controls improve. This adverse consequence should not be regarded as a signal to stop fighting against corruption; in contrast, it is an indicator to renew the combative efforts. When the fight reaches the level of negotiation corruption and gets it under control, also cash-rich firms can begin to experience the benefits of corruption controls.

Finally, this study is not without limitations that must be acknowledged but they also provide potential avenues for future research. First, the generalizability of this study may be limited because the sample was restricted to Vietnamese firms. This exposure to Vietnamese management styles may hinder the generalizability of the findings. Future studies, therefore, should extend the proposed theoretical framework and re-test it in other contexts. Second, the dataset employed in this study is quite short (10 years) in relation to the time required for the fight against corruption. Future research should thus re-test the validity of our findings using a larger dataset with longer survey periods. Finally, due to the limited information available in the data, we are unable to explicitly test the existence of administration corruption and negotiation corruption. Future studies may design questionnaires that capture these two types of corruption, which would allow a deeper understanding of the impact of corruption on firm performance.

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APPENDICES

Appendix 1: Governance Index Definitions and Summary Statistics

Variable	Definition	Mean	S.D.	Min.	Max.
Legal institutions	Measures the confidence in provincial legal institutions; whether firms regard provincial legal institutions as an effective vehicle for dispute resolution, or as an avenue for lodging appeals against corrupt official behaviour. The indicator ranges from 1 to 10; the higher the score, the better the institutions.	7.76	0.90	4.96	9.60
Entry costs	Measures the differences in entry costs for new firms across provinces (for example, length of business registration in days, etc.). The indicator ranges from 1 to 10; the higher the score, the lower the entry costs.	5.16	1.49	1.94	8.84
Land access	Combines two dimensions of the land problems confronting entrepreneurs: how easy it is to access land and the security of tenure once land is acquired. The variable ranges from 1 to 10; the higher the score, the better the access.	5.67	1.44	2.14	8.56
Time costs	Measures how much time firms waste on bureaucratic compliance, as well as how often and for how long firms must shut down their operations for inspections by local regulatory agencies. The indicator ranges from 1 to 10; the higher the score, the lower the time waste.	5.96	0.81	2.64	8.93
Business supports	Measures provincial services for trade promotion, provision of regulatory information to firms, business partner matchmaking, provision of industrial zones or industrial clusters, and technological services for firms. The indicator ranges from 1 to 10; the higher the score, the better the support.	5.84	1.06	4.13	8.94
Labour training	Measures the efforts by provincial authorities to promote vocational training and skills development for local industries and to assist in the placement of local labour. The indicator ranges from 1 to 10; the higher the score, the better the training.	4.54	1.25	1.39	9.39
Corruption controls	Measures how much firms pay in bribes, how much of an obstacle those extra fees pose for their business operations, whether payment of those extra fees results in expected results or "services," and whether provincial officials use compliance with local regulations to extract rents. The indicator ranges from 1 to 10; the higher the score, the better the corruption controls.	6.14	1.48	1.40	9.62
Transparency	Measures whether firms have access to the proper planning and legal documents necessary to run their businesses, whether those documents are equitably available, and whether new policies and laws are communicated to firms and predictably implemented. The indicator ranges from 1 to 10; the higher the score, the more transparent.	5.97	0.96	1.84	9.60
Leadership proactivity	Measures the creativity and cleverness of provinces in implementing central policy, designing their own initiatives for private sector development, and working within sometimes unclear national regulatory frameworks to assist and interpret them in favour of local private firms. The indicator ranges from 1 to 10; the higher the score, the more proactive.	4.82	1.02	2.00	7.91

Note: The studied panel encompasses all 63 provinces and municipal cities in Vietnam in the period 2006-2015, obtained from the Provincial Competitiveness Index (PCI) dataset.

Appendix 2: Details of Panel Structure

Year	Frequency	Percentage	Cumulative Percentage
2006	125,308	5.15%	5.15%
2007	149,007	6.13%	11.28%
2008	191,250	7.87%	19.15%
2009	216,988	8.93%	28.08%
2010	279,312	11.49%	39.57%
2011	332,925	13.69%	53.26%
2012	352,711	14.51%	67.77%
2013	253,758	10.44%	78.21%
2014	254,614	10.47%	88.68%
2015	275,208	11.32%	100%
Total	2,431,081	100%	
Number of years per firm	Frequency	Percentage	Cumulative Percentage
1	672,606	27.67%	27.67%
2	202,304	8.32%	35.99%
3	239,706	9.86%	45.85%
4	249,944	10.28%	56.13%
5	242,835	9.99%	66.12%
6	243,102	10.00%	76.12%
7	339,857	13.98%	90.10%
8	225,112	9.26%	99.36%
9	7,720	0.32%	99.68%
10	7,895	0.32%	100%
Total	2,431,081	100%	

Appendix 3: Pairwise Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gross profit (1)									
Corruption controls (2)	0.0712								
Cash (3)	0.6965	0.0798							
Firm age (4)	0.1071	-0.0243	0.182						
Firm size (5)	0.0839	0.1395	0.1145	0.298					
Owner age (6)	0.0781	0.0445	0.1329	0.3907	0.2191				
Distance (7)	0.0954	0.0607	0.0854	0.0885	0.0704	-0.1516			
Density (8)	-0.0921	-0.3407	-0.0939	-0.0712	-0.2075	-0.1515	-0.6676		
Consumption (9)	-0.1015	-0.4198	0.0043	-0.0265	-0.2698	-0.1163	-0.5186	0.8053	
Labour (10)	0.0775	0.3537	0.1595	0.0684	0.1408	0.1247	0.321	-0.5853	-0.5247

Note: All correlation coefficients are significant at 1%.