Full Length Article

The impact of corruption on the performance of newly established enterprises: Empirical evidence from a transition economy

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Abstract

This paper investigates the effects of corruption on the performance of newly established enterprises. Using longitudinal data from enterprise surveys containing virtually all firms over the period from 2011 to 2015 in Vietnam, we find that corruption deteriorates firm financial performance, and subsequently exposes them to a greater failure probability. We further find that, while corruption imposes more harmful effects on the performance and survival of private domestic firms, it exerts no significant impact on state-owned firms. On the other hand, foreign firms are also able to take advantage of corruption to enhance their performance and survivability. In addition, our results suggest that the more mature firms are better at dealing with corruption and can eventually take advantage of it to enhance their performance. The results are robust after various model specifications as well as alternative classifications of newly established firms.

1. Introduction

Entrepreneurship is acknowledged as one of the key factors that facilitates productivity (Erken, Donselaar, & Thurik, 2016), innovation (Sahut & Peris-Ortiz, 2014), employment opportunities (Decker, Haltiwanger, Jarmin, & Miranda, 2014), competition (Wennekers & Thurik, 1999), and ultimately, economic growth (Baumol & Strom, 2007; Galindo & Méndez-Picazo, 2013). However, a large number of firms have not lived up to expectations and suffer failure in the early stages of the corporate life cycle (Cefis & Marsili, 2011). In this context, entrepreneurship research has devoted significant efforts in examining factors which affect the performance of newly established enterprises. These studies focus on the role of entrepreneurs' characteristics, such as gender (Kalleberg & Leicht, 1991), age (Wennberg, Wiklund, DeTienne, & Cardon, 2010) and qualification (Bates, 2005), as well as firm-specific attributes such as financial resources (Sandberg & Hofer, 1987), operational strategies (Brüderl, Preisendörfer, & Ziegler, 1992) and human and social capital (Cooper, Gimeno-Gascon, & Woo, 1994; Santarelli & Tran, 2013).

Despite this large amount of literature, scholars have given much less attention to the broader environment in which firms operate. While some studies suggest that new firms with little control over the external environment are typically susceptible to exogenous pressures (Box, 2008; Shepherd, Douglas, & Shanley, 2000), particularly institutional impacts (Gaur & Lu, 2007), we are not aware of any study that explicitly investigates the role of corruption in shaping the performance and sustainability of newly established enterprises. This study

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aims to fill this gap in the literature by providing some of the first empirical analyses on the effect of corruption on the performance of newly established firms.

Arguably, corruption can be either grease-the-wheels or sand-the-wheels for firms. On the one hand, corruption could help firms to circumvent cumbersome rigid regulations (Dreher & Gassebner, 2013; Huntington, 1968; Leff, 1964), and speed up the slow-moving provision of public services (Bailey, 1966; Lui, 1985). Research (e.g., Huntington, 1968; Leff, 1964) shows that firms are often involved in informal payments for public favours such as tax incentives, subsidies, government contracts or acquiring important licenses. On the other hand, corruption can be deleterious to business activities since it is an 'additional tax' that directly increases firms' operational costs (Fisman & Svensson, 2007; Wei, 2000), drains away the scarce resources that are vital for firm performance and survivability (Cooper et al., 1994; Kaufmann & Wei, 1999; Santarelli & Tran, 2013), and accelerates operational risk due to the unpredictability and unenforceability of the illegal bureaucratic requests (Svensson, 2005; Wei, 1997). For new firms, the levels of risk and costs associated with corruption can be excessively high because they often lack business skills and market information required to deal with environmental pressures (Shepherd et al., 2000). In addition, in the allocation of public resources, corrupt public officials with discretionary power usually prioritise more established firms with strong ties and close alignments of interests. Thus, they could be more likely to impose extra delays and difficulties to extract bribes from new firms that are less connected. As a result, although bribes could be used in exchange for certain favours, it is unlikely that new firms have established sufficiently close relationships with public officials to gain advantages through bribery (Singh, Tucker, & House, 1986).

The effect of corruption on firm performance might also vary across firms with different types of ownership. While corruption can be harmful to the performance of private firms (Nguyen & Van Dijk, 2012), it may not hamper state-owned enterprises (SOEs). This is because a close relationship and mutual share of benefits with governments may shield the SOEs from the negative effects of government expropriation, such as the use of bureaucrats' discretionary impositions to manipulate the regulatory regime, and extract bribes from firms (Hellman, Jones, & Kaufmann, 2003). As corrupt transactions are kept discrete, governments often trust firms with a high degree of connection. Therefore, the SOEs would have a higher chance to pursue rent-seeking, receive a disproportionate share of public favours such as better access to loans, more favourable regulations and policies, as well as more subsidies and tax incentives. Earlier literature about foreign firms often documents mixed evidence on how local corruption affects their operating outcomes. While some studies posit that corruption exerts a negative impact on foreign direct investment (Cuervo-Cazurra, 2008; Wei, 2000), others contend that the impact can be positive (Egger & Winner, 2005; Helmy, 2013). As setting up a new foreign plant involves complicated bureaucratic procedures, foreign firms might be willing to pay bribes to shorten their entry process (Meyer, 2001) and gain access to lucrative government contracts (Egger & Winner, 2005).

Inquiries into the role of corruption in determining the performance of new firms in transition economies are limited. Cuervo-Cazurra (2008) and Iwasaki and Suzuki (2012) argue that, in the communist regions, corruption is rampant, and it is the cause of grave economic and social issues. During the transition period, where inconsistent law enforcement, unclear and rapid changing regulations, and a weak juristic system co-exist, corruption emerges more as self-interest. Government officials are given discretionary powers to pursue their own self-interests and privately charge bribes, which consequently imposes greater costs and risks on firms (Iwasaki & Suzuki, 2012). Nevertheless, in many transition economies, corruption is still perceived as a necessary social evil that enables firms to overcome various difficulties. Thus, whether corruption is a necessary evil that facilitates firm performance, or is more about self-interest that is harmful to firms, is still an open empirical question.

This paper aims to fill this gap in the literature by providing evidence of the effects of corruption on the operating outcomes of newly established firms in a transition economy. From the Annual Enterprises Survey (AES) conducted by the General Statistics Office (GSO) of Vietnam and the Provincial Competitive Index (PCI) provided by the Vietnam Chamber of Commerce and Industry (VCCI), we obtain a unique panel dataset containing information on more than 342,000 firms spread across different types of ownership during the period from 2011 to 2015. Our analysis confirms that corruption sands-the-wheels, and deteriorates both firm performance and survivability significantly. These negative impacts are more severe for new firms, suggesting that firms at the early stage of development are more susceptible to corruption than their more well-established counterparts. Moreover, the effects of corruption on the performance and survival of new firms do not appear to be homogeneous across different types of ownership. Corruption is more detrimental to private firms, while exerting no significant impact on the performance and survivability of SOEs. On the other hand, foreign firms are able to take advantage of corruption to enhance their performance and sustainability. These results are consistent and robust regardless of various model specifications.

The rest of this paper is organised as follows: Section 2 presents a background of the economy of Vietnam; Section 3 discusses the data and research methodology, followed by the empirical findings in Section 4; Section 5 provides additional analyses and robustness tests; Section 6 concludes the paper.

2. Background on Vietnam economy

For more than a decade after national reunification, Vietnam has followed a central economic planning mechanism in which SOEs were set as the major driving force of the economy, serving as both production and social units (Turner & Nguyen, 2005). Nevertheless, after experiencing a poor economic performance, the Vietnam Communist Party implemented the *Doi Moi* (Renovation) political and economic reform in 1986,

aiming to transform the centrally planned economy to a market-oriented one (Riedel & Turley, 1999). The country opens the door and facilitates the liberalisation of the private market, trade and investment (Turner & Nguyen, 2005).

Thereafter, the issuance of many legal documents, including the Enterprise Law in 1999 and the Law on Investment in 2005, has established an improved legal framework for promotion of the private sector. The subsequent U.S. − Vietnam Bilateral Trade Agreement (BTA) that was signed in 2000 helped to clear the way for Vietnam's accession to the World Trade Organisation (WTO) in 2007, which marked a crucial step forward in the development of Vietnam's economy. The transformation to a market-oriented economy has resulted in a significant number of new firm registrations. There was a tremendous increase from 20,000 new firms per year in the 2000s to more than 90,000 new firms per year in the 2010s (GSO, 2017a). By the end of 2015, there were 442,000 operating firms. This number was 11.3 times higher than in 2000, which was the first year in which the Enterprise Law took effect (GSO, 2017a). The average growth rate of the domestic private sector was highest at 18.9% per year, followed by the foreign invested sector with a growth rate of 14.7% per year (GSO, 2017a). According to Tran and To (2018), the private sector was the key contributor to the spur of economic growth in Vietnam as it contributed 43.22% to the total GDP in 2017. By contrast, the growth rate of the number of SOEs has been reduced by 4.4% per year, partly due to the process of restructuring and privatising SOEs (GSO, 2017a). Nonetheless, SOEs with huge cash injections from the state budget and nonmonetary favours of the state patronage still play an important role in critical industries such as energy, telecommunications, and banking and finance.

There are, however, noticeable phenomena after three decades of renovation in Vietnam. More than 90% of operating firms are of small and medium size (MPI, 2017), of which 69% have less than 10 employees (GSO, 2017a). Although these small and medium sized enterprises (SMEs) are an important engine of economic development, they are more vulnerable to market frictions and institutional failures (Beck & Demirguc-Kunt, 2006), possibly because of resource scarcity and dependence upon external infrastructure and systems (Storey, 1994). As it happens, while a large number of firms have been entering the market during the period from 2011 to 2017, the number of firms exiting the market was strikingly high (National Business Registration Portal, 2017). According to GSO (2017b), 2017 was the record year for newly registered enterprises with 126,589 registrations. At the same time, more than 60,000 firms stopped or went bankrupt.

Reasons for such duality are often cited as being complicated regulations, insufficient support services, limited access to capital and land, inconsistent implementation of government rules across provinces and especially corruption (Beck & Demirguc-Kunt, 2006; Malesky, 2018; Tran, Grafton, & Kompas, 2009). In the latest PCI report, Malesky (2018) documents that high corruption levels are a major obstacle to doing business in Vietnam. Corruption is found among administrative cadres and public employees at the province level where the provincial executives control most business

government interactions (Bai, Jayachandran, Malesky, & Olken, 2019) including business registration and licensing, environmental and safety inspections, land and budget allocation, construction permits and labour oversight (Bai et al., 2019; Nguyen & Van Dijk, 2012).

Even though Vietnam has launched a rigorous anti-corruption campaign[1] to improve its business environment, the country's ranking for ease of doing business remained low[2] (World Bank, 2017). According to the PCI 2017 report, 70% of firms perceived that a close relationship with the authorities is vital for obtaining legal and planning documents (Malesky, 2018). More than two-thirds of surveyed respondents indicated that unofficial payments were widespread; more than 10% of these respondents reported that they paid a large amount for corrupt activity, and more than half of them believed that "commissions" would be needed to secure the government's bids (Malesky, 2018). These observations raise a great concern over the relationship between corruption and the operating outcomes of newly established firms, making the economy of Vietnam an ideal empirical setting to study the effects of corruption on the performance of newly established enterprises in transition economies.

3. Description of data and variables

3.1. Data

The main dataset used in this study is retrieved from the AES conducted by the General Statistics Office of Vietnam (GSO) for the period from 2011 to 2015. The AES includes information on tax identification, types of firm ownership (i.e., state-owned, foreign-owned and private-owned), operating status, total assets, number of employees, employee gender, key business performance indicators and other indicators. To mitigate the effect of outliers and data errors, we follow the literature (e.g., Hope, Thomas, & Vyas, 2013; Kayhan & Titman, 2007) and remove all financial, utility and cooperative firms from the sample. We further eliminated firms with inadequate information and firms that reported extreme or unbelievable values. Based on the firms' unique tax identification numbers, we obtained a panel dataset of over 342,000 firms.

The second data source comes from the PCI database provided by VCCI and the United States Agency for International Development (USAID). The PCI database was designed to

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[1] The extensive anti-corruption campaign started in the 2010s, especially after the establishment of the Central Steering Committee on Anti-Corruption, which is directly administered by the Vietnamese Politburo and chaired by the Party General Secretary. Accordingly, the Committee is responsible for detecting and executing corruption and misconduct behaviour at both the state and the enterprise levels. The campaign has achieved many concrete outcomes: it has found violations of over VND 400,000 billion (equivalent to USD 17 billion) and 18,525 ha (equivalent to 45,776 acres) of land through inspection (Session 14, 2018), applied disciplinary procedures to 840 Party agents and 58,120 Party members violating anti-corruption regulations. 490 Party agents and 35,000 Party members were punished (Nhân Dân, 2018).

[2] Vietnam ranked 68th over 190 economies for the ease of doing business (World Bank, 2017).

105890 assess and rank the performance, capacity and willingness of provincial governments to develop business-friendly regulatory environments for private sector development based on the following criteria: low entry cost; easy access to land and stable business premises, that is, the transparent business environment where enterprises have equal access to necessary information and legal documents for running the business; time spent by the enterprise on carrying out the most restrictive administrative and inspection procedures; unofficial fees to be kept at a minimum; active and proactive provincial leaders; business support services provided by the public and private sectors; good labour training policies; the legal and judicial system for the settlement of disputes fairly and effectively.

With these sources of data from AES and PCI, we obtain and utilise unique and exhaustive cross-sectional time-series data covering firms' characteristics and provincial institutional qualities to shed light on the impact of corruption on new firms' performances.

3.2. Variables

3.2.1. Firm performance

Following Bhagat and Bolton (2008), and Vu, Tran, Nguyen, and Lim (2016), we measure a firm's performance using return on assets (ROA). ROA is calculated from dividing a firm's net income by its total assets. This measure is conventionally used in corporate finance literature as it explicitly takes into account the assets required to run business activities and, as such, enables firm managers and stakeholders to evaluate both the business condition and the future prospective of firms effectively.

3.2.2. Corruption

Méon and Sekkat (2005), Cuervo-Cazurra (2008), and Iwasaki and Suzuki (2012) use the "Control of Corruption", provided by the World Bank and the "Corruption Perceptions Index", provided by the International Transparency to proxy for corruption. These two data sources are only available at a national level. In Vietnam, the number of firms' perceived of corruption at the provincial level was considered as an appropriate corruption measure (Bai et al., 2019; Nguyen & Van Dijk, 2012; Vu et al., 2016). This measure is considered appropriate because the interactions between business and government that might involve corruption practices regarding business registration, government procurement and land permission happen at the provincial level. The provincial leadership also exerts control over corruption practices of subordinate agencies, leading to the relative homogeneity of corruption levels within a provincial administration unit (Bai et al., 2019).

In our analysis, we proxy for local government corruption levels by using the 'Informal Payments' indicator retrieved from the Vietnam PCI database. The indicator measures the perception of firms of the prevalence of corruption in the local business environment, ranging from 0 to 10, with a higher score representing a higher level of corruption control by the provincial authorities. The use of an 'Informal Payment' as a proxy for corruption has been a common practice in recent

corruption-related studies (i.e., Nguyen & Van Dijk, 2012; Bai et al., 2019; Vu et al., 2016; Tran, 2019). We rescale this measure by subtracting it from 10 so that a higher score indicates a higher level of corruption.

3.2.3. Control variables

In this study, we incorporate a number of firm-specific control variables in our empirical specification that might determine firms' performances as suggested by previous studies (e.g. Box, 2008; Brüderl et al., 1992; Wennberg et al., 2010). Specifically, we incorporate *SIZE, LEVERAGE, LABOUR, FEMALE, TANGIBILITY,* and *TAXPAID. SIZE* is the variable indicating the size of a firm, which is measured by the natural logarithm of the firm's total assets. *LEVERAGE* is the debt-to-equity ratio, which is measured by dividing a firm's liabilities by its total assets. *LABOUR* is measured by taking the natural logarithm of the total number of employees. *FEMALE* is the percentage of female members in the total number of employees. *TANGIBILITY* is the natural logarithm of the tangible assets. Finally, *TAXPAID* is measured by taking the natural logarithm of the amount of tax a firm paid. Summary statistics for our main variables are reported in Table 1. The correlation matrix is provided in Table 2.

4. Empirical analysis

4.1. Corruption and firm performance – new firms versus mature firms

To examine whether corruption exerts different effects on the new firms and their mature counterparts, we employ a contingency model in which firm performance is regressed on corruption, a dummy variable indicating new firms and their interaction term as follows:

$$\pi_{it} = \delta_0 + \delta_1 CORRUPTION_{it-1} + \delta_2 CORRUPTION_{it-1}$$
$$\times NEW\ FIRM_{it-1} + \delta_3' X_{it-1}^j + \theta_t + \varphi_i + \mu_{it}, \quad (1)$$

where π_{it} is the performance (*ROA*) of firm i at time t; *CORRUPTION* is the firm's perception of the prevalence of '*informal payment*' in the provincial business environment; *NEW FIRM* is a dummy variable which takes the value of 1 if a firm is newly established and 0 otherwise. Following Williams (2004), we define new firms as those having no more than 2, 3, 4, and 5 years of being established.[3] In addition, we incorporate a vector of control variables X_{it}^j = [*SIZE, LEVERAGE, LABOUR, FEMALE, TANGIBILITY, TAXPAID*] that may have influence over firm performance and is used commonly in the corporate finance literature (i.e., Brüderl et al., 1992; Box, 2008; Wennberg et al., 2010). φ_i and θ_t are firm and year fixed effects, which are employed to account for the unobserved firm-specific characteristics and

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[3] We do not consider firms which are less than 1 year old because, in our specification, the dependent variable (firm performance) is regressed on the lagged form of all right-hand-side variables to mitigate the endogeneity.

Table 1
Summary statistics.

	Observation	Mean	Std. Dev.	25th	t	75th
Panel A: All firms						
ROA	818,016	−0.016	0.228	−0.010	0.000	0.008
CORRUPTION	818,016	5.916	1.077	4.676	6.000	6.667
SIZE	818,016	8.446	1.565	7.467	8.374	9.320
LEVERAGE	818,016	0.636	1.577	0.375	0.645	1.000
LABOR	818,016	2.091	1.283	1.099	1.792	2.708
FEMALE	818,016	0.341	0.220	0.200	0.333	0.500
TANGIBILITY	818,016	0.207	0.388	0.051	0.108	0.268
TAXPAID	818,016	3.263	2.431	1.099	3.270	4.966
Panel B: State-owned firms (SOEs)						
ROA	7549	0.023	0.187	0.001	0.017	0.055
CORRUPTION	7549	5.842	1.092	4.852	5.754	6.667
SIZE	7549	11.488	1.908	10.185	11.430	12.725
LEVERAGE	7549	0.717	0.609	0.396	0.763	1.000
LABOUR	7549	4.812	1.472	3.807	4.836	5.768
FEMALE	7549	0.329	0.199	0.175	0.298	0.453
TANGIBILITY	7549	0.545	0.507	0.152	0.412	0.848
TAXPAID	7549	7.612	2.785	6.163	7.813	9.369
Panel B: Private domestic firms						
ROA	786,842	−0.014	0.218	−0.009	0.000	0.007
CORRUPTION	786,842	5.915	1.075	4.676	6.000	6.667
SIZE	786,842	8.373	1.489	7.440	8.328	9.244
LEVERAGE	786,842	0.628	1.010	0.375	0.642	1.000
LABOUR	786,842	2.023	1.201	1.099	1.792	2.639
FEMALE	786,842	0.338	0.218	0.200	0.333	0.500
TANGIBILITY	786,842	0.197	0.358	0.050	0.105	0.253
TAXPAID	786,842	3.156	2.329	1.099	3.207	4.850
Panel C: FDI firms						
ROA	23,625	−0.072	0.459	−0.084	0.002	0.066
CORRUPTION	23,625	5.993	1.136	4.768	6.006	6.667
SIZE	23,625	10.273	2.111	8.914	10.296	11.648
LEVERAGE	23,625	0.913	7.578	0.365	0.774	1.000
LABOUR	23,625	3.853	1.890	2.398	3.784	5.198
FEMALE	23,625	0.458	0.265	0.250	0.438	0.667
TANGIBILITY	23,625	0.467	0.902	0.065	0.348	0.696
TAXPAID	23,625	5.894	3.201	3.714	6.358	8.248

Table 2
Pairwise correlation matrix.

	VIF	1	2	3	4	5	6	7	8	9
1. ROA		1								
2. CORRUPTION	1.09	0.012	1							
3. AGE	1.14	0.029	−0.104	1						
4. SIZE	1.72	0.134	−0.127	0.228	1					
5. LEVERAGE	1.01	−0.032	0.020	−0.005	0.037	1				
6. LABOUR	1.73	0.023	0.059	0.308	0.554	0.009	1			
7. FEMALE	1.02	−0.011	−0.030	−0.037	0.027	0.014	−0.076	1		
8. TANGIBILITY	1.04	−0.010	0.033	0.105	0.040	0.016	0.158	0.020	1	
9. TAXPAID	1.51	0.119	0.116	0.212	0.496	0.060	0.474	0.056	0.096	1

significantly deters firm performance. Our results are consistent with the findings from previous studies including Wei (2000), Svensson (2005), and Nguyen and Van Dijk (2012).

The estimated coefficients of the interaction terms between *CORRUPTION* and *NEW FIRM* are negative and statistically significant, regardless of the classification of new firms.[4] These results provide strong evidence that corruption exhibits more detrimental effects on the performance of new firms compared to their more mature counterparts. It is likely that, at the early stage of the corporate cycle, corruption raises operating expenses and prevents firms from allocating their scarce resources effectively for profitable activities. In addition, new firms, with their lack of knowledge and business skills, can suffer from immense difficulties in handling the risks of bribe extraction by public officials and the partner-related risks in a corrupt environment, leading to lower performance. On the other hand, as firms grow older, they acquire business skills and information through a searching and learning process, making corruption less detrimental to their performance (Shepherd et al., 2000).

4.2. Corruption and firm performance: does ownership matter?

As discussed earlier, in transition economies, the effect of corruption on firm performance might vary across different types of firm ownership. While SOEs might make use of their relationship with the government to avoid bribe extraction and pursue rent-seeking, private and FDI firms without well-established political connections might be subjected to government exploitation in a corrupt environment. Thus, in this section, we investigate how corruption affects the performance of firms with different types of ownership. To do so, we split

time-invariant influences, and μ_{it} is the error term. To mitigate a potential endogeneity problem, we follow Iwasaki and Suzuki (2012) and Gyimah-Brempong and de Camacho (2006) to take the lag of all right-hand-side variables for one year, which can be used as predetermined variables in our models.

The regression results are presented in Table 3. The estimated coefficients of *CORRUPTION* are negative and significant, suggesting that corruption is sand-the-wheels that

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[4] It is worth noting that the R^2 values in our models are relatively small (i.e., 1.2%). This suggests that our models only explain a modest proportion of the variance in firm performance in our samples. However, it neither suggests that our estimations are biased nor influences the statistically significant explanatory power of our models. In fact, a small R^2 has been reported in several papers employing large data sets of enterprises in Vietnam, such as Nguyen and Van Dijk (2012), De Jong, Tu, and van Ees (2012) and Vu et al. (2016). Thus, we are convinced that small R^2 should not pose a serious concern to the validity and reliability of our results.

Table 3
The effect of corruption on firm performance: new firms vs. mature firms.

	Dependent variable: ROA			
	Firms under 2-year of age	Firms under 3-year of age	Firms under 4-year of age	Firms under 5-year of age
	(1)	(2)	(3)	(4)
CORRUPTION	−0.003***	−0.003***	−0.003***	−0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
NEW FIRM	0.027***	0.019***	0.013**	0.010*
	(0.006)	(0.005)	(0.005)	(0.005)
CORRUPTION × NEW FIRM	−0.003***	−0.003***	−0.003***	−0.002***
	(0.001)	(0.001)	(0.001)	(0.001)
SIZE	−0.009***	−0.009***	−0.009***	−0.009***
	(0.000)	(0.000)	(0.000)	(0.000)
LEVERAGE	0.001*	0.001*	0.001*	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
LABOUR	0.007***	0.007***	0.007***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)
FEMALE	0.016***	0.016***	0.016***	0.016***
	(0.002)	(0.002)	(0.002)	(0.002)
TANGIBILITY	0.003**	0.003**	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
TAXPAID	−0.001*** (0.000)	−0.001*** (0.000)	−0.001*** (0.000)	−0.001*** (0.000)
Firm dummies	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES
R^2	0.012	0.012	0.012	0.012
Number of obs.	818,016	818,016	818,016	818,016
Number of firms	342,104	342,104	342,104	342,104

Note: Constants are excluded for brevity. Robust standard errors are in parentheses.
*, **, and *** denote significance at the 10%, 5% and 1% level, respectively.

our full sample into three sub-samples containing only SOEs, private domestic firms, and FDI firms, respectively, and then re-estimate Equation (1). The estimation results of the sub-samples of SOEs, private domestic firms and FDI firms are presented in Columns 1—4, Columns 5—8 and Columns 9—12, respectively, of Table 4.

As shown in Columns 1 to 4, the estimated coefficients of *CORRUPTION* and its interaction terms with new firm dummies are not statistically significant. This result is consistent across different ways of new firm classification, indicating that corruption exerts no significant impact on the performance of SOEs. This finding supports the supposition that, in a transition economy, SOEs might utilise their relationship and alignment of interests with government officials to protect themselves from the risks of bribe extraction, as well

as from the risks of paying the bribe without receiving any commensurate benefits. Such a political connection might also endow them with priorities in obtaining public favours, specialised licenses, and government contracts that are vital to obtaining competitive advantages. Thus, SOEs in transition economies like Vietnam are in a position that isolates them from any negative impact of corruption.

Meanwhile, the estimated coefficients of *CORRUPTION* are negative and statistically significant in Columns 5 to 8, suggesting that corruption is harmful to the performance of domestic private firms.[5] This is not a surprising result because, as opposed to SOEs, private domestic firms often lack political connections and, therefore, privileged treatment by government officials. In the context of transition economies where the use of bribes by public officials to gain self-interest is rampant, private domestic firms have to confront excessive bureaucratic burdens and government exploitation directly, which subsequently hinders their performance. It is worth noting that the negative influence of corruption is more pronounced for the group of new firms, as indicated by the negative and significant coefficients of the interaction terms *CORRRUPTION×NEW FIRM*.

With regard to FDI firms, the coefficients of *CORRUPTION* in Columns 9 to 12 are not statistically significant. Nevertheless, the estimated coefficient of the interaction terms *CORRUPTION×NEW FIRM* are negative and statistically significant in all model specifications, indicating that corruption exerts a negative impact on the group of new FDI firms. This might be because, as opposed to more mature FDI firms,

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[5] One might argue that the insignificant effects of corruption on newly established SOEs found in columns 1 to 4 are due to the relatively small sample size of SOEs compared to that of domestic private firms. (The sample size of SOEs is only 7549 firm-year observations, while that of domestic private firms comprises up to 787,010 firm-year observations.) To address this concern, we randomly select a sample of 7549 firm-year observations from the domestic private firms to ensure that the results could be comparable between the two groups of state-owned firms and private domestic firms. Models 5 to 8 are re-estimated accordingly. The estimated coefficients of *CORRUPTION×NEW FIRM* remain negative and statistically significant, suggesting a detrimental effect of corruption on the performance of newly established domestic private firms. This result mitigates the concern that our results are driven by discrepancies in sample sizes between state-owned and private firms. For the sake of brevity, these results are not reported here. However, they are available upon request.

Table 4
The effect of corruption on firm performance — Does ownership matter?

	Dependent variable: ROA											
	SOE				Private				FDI			
	Firms under 2-year of age	Firms under 3-year of age	Firms under 4-year of age	Firms under 5-year of age	Firms under 2-year of age	Firms under 3-year of age	Firms under 4-year of age	Firms under 5-year of age	Firms under 2-year of age	Firms under 3-year of age	Firms under 4-year of age	Firms under 5-year of age
	1	2	3	4	5	6	7	8	9	10	11	12
CORRUPTION	−0.001	−0.002	−0.002	0.000	−0.003***	−0.003***	−0.003***	−0.002***	0.002	0.006	0.007	0.005
	(0.004)	(0.004)	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)
CORRUPTION × NEW FIRM	0.005	0.015	0.007	−0.004	−0.003***	−0.002***	−0.002***	−0.002***	−0.025**	−0.033***	−0.028***	−0.018**
	(0.012)	(0.009)	(0.008)	(0.007)	(0.001)	(0.001)	(0.001)	(0.001)	(0.011)	(0.009)	(0.008)	(0.007)
NEW FIRM	−0.032	−0.134**	−0.065	0.027	0.028***	0.015**	0.011**	0.009*	0.161**	0.229***	0.209***	0.153***
	(0.077)	(0.062)	(0.055)	(0.049)	(0.006)	(0.005)	(0.005)	(0.005)	(0.080)	(0.062)	(0.059)	(0.053)
SIZE	−0.002	−0.002	−0.002	−0.002	−0.009***	−0.009***	−0.009***	−0.009***	−0.008***	−0.008***	−0.008**	−0.008**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)	(0.003)
LEVERAGE	0.007	0.007	0.007	0.007	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000
	(0.005)	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
LABOUR	−0.017**	−0.018**	−0.017**	−0.017**	0.007***	0.007***	0.007***	0.007***	0.001	0.000	0.000	0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.001)	(0.001)	(0.001)	(0.001)	(0.009)	(0.009)	(0.009)	(0.009)
FEMALE	−0.036*	−0.035*	−0.035*	−0.035*	0.013***	0.013***	0.013***	0.013***	0.022	0.022	0.022	0.023
	(0.019)	(0.019)	(0.019)	(0.019)	(0.002)	(0.002)	(0.002)	(0.002)	(0.018)	(0.018)	(0.018)	(0.018)
TANGIBILITY	0.027***	0.027***	0.027***	0.027***	0.001	0.001	0.001	0.001	0.018***	0.018***	0.018***	0.018***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.001)	(0.001)	(0.001)	(0.001)	(0.006)	(0.006)	(0.006)	(0.006)
TAXPAID	−0.001	−0.001	−0.001	−0.001	−0.001***	−0.001***	−0.001***	−0.001***	−0.001	−0.001	−0.001	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)	(0.002)	(0.002)
Firm dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R²	0.004	0.003	0.004	0.004	0.012	0.012	0.012	0.012	0.005	0.006	0.006	0.006
Number of obs.	7549	7549	7549	7549	787,010	787,010	787,010	787,010	23,647	23,647	23,647	23,647
Number of firms	3525	3525	3525	3525	335,939	335,939	335,939	335,939	11,904	11,904	11,904	11,904

Note: Constants are excluded for brevity. Robust standard errors are in parentheses.
*, **, and *** denote significance at the 10%, 5% and 1% level, respectively.

new foreign entrants might fall short of the local sense and political connections to cope with host country corruption, hence suffering from lower firm performance under the influence of corruption.

5. Additional analyses

The previous section reveals that corruption is more harmful to new firms than it is to mature firms. However, far-reaching implications cannot be drawn at this stage because it is not clear how and in which circumstances new firms respond to corruption. The drawback of the analysis presented above is that all of the tests do not explicitly impose any restriction on firm age. If corruption is correlated with unobservable specific features of new firms, such as possessing limited skills and networks to deal with corrupt government officials and rigid government processes, ignorance of such a variation would lead to estimation bias. While the setting in the previous sections allows us to have a comparative analysis between both new and more mature firms, the results only fall within particular types of ownership and we cannot see how new private domestic firms behave and perform in comparison to new foreign firms and new state-owned firms. We may also suffer from the problem of overfitting if the group of new firms' accounts for a proportion of the total number of firms that is either too small or too large.

We refine our analysis to examine the effect of corruption on a sub-sample containing only new firms. Unfortunately, there is no consensus and clear-cut definition of new firms in the literature. In this paper, we classify new firms as those with no more than three years of establishment.[6] The rationale behind this threshold is that a period of three years after establishment is generally considered to be a critical milestone during a firm's life span. As observed by Gibbs (1990), the highest failure hazards occur within the first three years of operation, making this period the "valley of death" for new entrants. In the context of Vietnam, 90% of start-ups are on the verge of bankruptcy in less than three years of operation (Anh, 2018). Once they have surpassed this period, new firms are closer to being a prospect for success. Empirical research using this upper bound of firm age to delineate new firms includes, for example, Cooper et al. (1994). As a result, our dataset contains 320,912 firm-year observations that meet this sample formation criterion.

5.1. Does corruption affect the performance of new firms?

To examine the effect of corruption on the performance of new firms, the following specification is employed:

$$\pi_{it} = \delta_0 + \delta_1 CORRUPTION_{it} + \delta_2' X_{it}^j + \theta_t + \varphi_i + \varepsilon_{it}^1 \qquad (2)$$

where i denotes firm i at time t. Performance is measured by ROA. X_{it-1}^j is a set of control variables that have influence over performance. ε_{it}^1 is the error term. Firm fixed effects (φ_i) and year fixed effects (θ_t) are incorporated to account for the unobserved firm-specific characteristics and time-invariant influences. We use lagged right-hand-side variables to mitigate potential endogeneity problems. To investigate more about whether the effects of corruption on the performance of new firms differ across various types of firms, we include interaction terms between corruption (CORRUPTION) and dummy variables indicating private domestic firms (PRIVATE), state-owned enterprises (SOE), and foreign firms (FDI).

The regression results are reported in Table 5. The estimated coefficients of CORRUPTION are negative and statistically significant, thus supporting the result reported earlier that corruption significantly deteriorates firm performance. However, the results from Columns 3 and 4 confirm that corruption does not affect the performance of SOEs as the estimated coefficients on SOE dummy and CORRUPTION×SOE are not statistically significant.

The estimated coefficients of PRIVATE in Columns 5 and 6 are both positive and statistically significant, suggesting that new private firms perform better than others. Nevertheless, corruption imposes more harmful effects on the performance of new private firms as the estimated coefficient on the interaction term between CORRUPTION and PRIVATE is negative and significant.

For FDI firms, the positive and significant coefficients of CORRUPTION×FDI illustrates that new foreign firms with less than three years of establishment suffer less detrimental effects from corruption. This is not a surprising result because new foreign firms might be willing to pay bribes to transcend the bureaucratic burden during the entry process.

5.2. Corruption and the failure of newly established firms

We expand our analysis to study how corruption affects the failure probability of new firms using the Cox proportional hazard model, which is an approach that has been used commonly in the studies of new firm survival (Audretsch, Houweling, & Thurik, 2000). In this study, we rely on the operating status disclosed in the survey dataset and we decide that a firm fails in a given year if its operating status is coded 2, 3 or 4, which equates to "Stop operation for investment or technological innovation", "Stop operation for dissolution or merger" and "Stop operation for other reasons", respectively. Following the literature, the hazard function $h(t|x_i)$ of a firm is specified as follows:

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[6] In entrepreneurship research, a new firm is also defined as one operating for 6 years or less after the start of business activities (Baum & Locke, 2004). To provide further robustness to our result, we alternatively examine the effects of corruption on the group of new firms using different operating windows. Specifically, we define new firms as those with no more than 2 years (i.e., Baum, Locke, & Kirkpatrick, 1998), 4 years (i.e., Rauch, Frese, & Utsch, 2005) and 6 years (i.e., see Littunen, 2000) since establishment. Our results remain consistent and robust, thus reinforcing the previous findings that corruption affects the performance and sustainability of new firms negatively. For the sake of brevity, these results are not reported here. However, they are available upon request.

Table 5
Effects of corruption on the performance of newly established firms.

	Firm Performance (ROA)							
	All new firms		SOE		Private		FDI	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CORRUPTION	−0.009***	−0.009***	−0.009***	−0.009***	−0.009***	−0.006***	−0.009***	−0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
SIZE	−0.015***	−0.015***	−0.015***	−0.015***	−0.016***	−0.016***	−0.016***	−0.016***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
LEVERAGE	0.008	0.009	0.008	0.008	0.008	0.008	0.008	0.008
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
LABOUR	0.010***	0.010***	0.010***	0.010***	0.010***	0.010***	0.010***	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
FEMALE	0.021***	0.0208***	0.021***	0.021***	0.019***	0.019***	0.019***	0.019***
	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)
TANGIBILITY	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
TAXPAID	−0.002***	−0.002***	−0.002***	−0.002***	−0.002***	−0.002***	−0.002***	−0.002***
	0.000	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SOE			0.027	0.033				
			(0.024)	(0.022)				
CORRUPTION × SOE				0.002				
				(0.002)				
PRIVATE					0.010***	0.088***		
					(0.013)	(0.014)		
CORRUPTION × PRIVATE						−0.003*		
						(0.001)		
FDI							−0.113***	−0.101***
							(0.014)	(0.016)
CORRUPTION × FDI								0.003*
								(0.002)
Firm fixed effects	NO	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	NO	YES	YES	YES	YES	YES	YES	YES
R^2	0.013	0.014	0.013	0.013	0.014	0.014	0.015	0.015
No. Firms	195,039	195,039	195,039	195,039	195,039	195,039	195,039	195,039
No. Obs.	320,912	320,912	320,912	320,912	320,912	320,912	320,912	320,912

Note: Constants are excluded for brevity. Robust standard errors are in parentheses.
*, **, and *** denote significance at the 10%, 5% and 1% level, respectively.

$$h(t|x_i) = h_0(t)\exp\left(X'_{it}\beta\right), \qquad (3)$$

where $h_0(t)$ is an arbitrary and unspecified baseline hazard function that presents the failure probability of firm i having survived until time t, and $X'_{it}\beta$ is the suitable function of covariates, in which β is the vector of unknown parameters to be estimated. In this study, the following function of $X'_{it}\beta$ is employed:

$$X'_{it}\beta = \delta_0 + \delta_1 CORR_{it} + \delta'_2 X^j_{it} + \varepsilon^2_{it}, \qquad (4)$$

where i denotes firm i, t denotes year t, X^j_{it} is the control vector of firm-specific characteristics, and ε^2_{it} is the error term.

Table 6 presents the results of the Cox Proportional Hazard to predict firm failure. The coefficients of CORRUPTION are positive and significant in all of the specifications (except for Column 6), thus providing further support for the detrimental effect of corruption on new firm survival. In Column 3, the estimated coefficient of SOE is positive and significant, suggesting that new SOEs are more likely to fail than other types of new firms. Nevertheless, both the estimated coefficients of SOE and on its interaction term with CORRUPTION are not

statistically significant, indicating that corruption does not affect the SOEs. The estimated coefficient on PRIVATE in Column 5 is negative and significant. Nonetheless, the coefficient of CORRUPTION×PRIVATE is positive and significant, indicating that new private domestic firms are more susceptible to the failure risks as the level of corruption increases.

By contrast, the significant and positive coefficient on FDI in Column 7 implies that FDI firms suffer a higher hazard rate than other firms. The estimated coefficient of CORRUPTION×FDI in Column 8 is negative and significant, indicating that corruption is less detrimental to the survival of FDI firms when compared to their domestic counterparts.

5.3. Other robustness tests

To ensure the robustness of our results, we perform additional tests, including tests using the IV-2SLS and GMM estimators to control for any possible endogeneity bias further. We first re-estimate our baseline model using the traditional IV-2SLS estimator with instrumental variables that are correlated to the endogenous CORRUPTION variable, although not correlated with the error term or the

Table 6
Corruption and corporate failure − controlling for types of ownership.

	Cox Proportional Hazard Model							
	All new firms		SOE		Private		FDI	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CORRUPTION	0.047***	0.043***	0.047***	0.047***	0.047***	−0.207	0.047***	0.049***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.124)	(0.012)	(0.012)
SIZE	−0.067***	−0.131***	−0.067***	−0.067***	−0.067***	−0.067***	−0.067***	−0.067***
	(0.009)	(0.011)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
LEVERAGE	0.017***	0.016***	0.017***	0.017***	0.016***	0.016***	0.016***	0.016***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
LABOUR	−1.093***	0.047	−1.094***	−1.094***	−1.093***	−1.094***	−1.093***	−1.093***
	(0.018)	(0.031)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
FEMALE	0.138***	−1.122***	0.138***	0.138***	0.137***	0.137***	0.137***	0.138***
	(0.035)	(0.019)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
TANGIBILITY	0.052***	0.404***	0.052***	0.052***	0.052***	0.052***	0.052***	0.052***
	(0.007)	(0.038)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
TAXPAID	−0.028***	0.042***	−0.028***	−0.028***	−0.028***	−0.028***	−0.028***	−0.028***
	(0.005)	(0.007)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
ROA	0.014	−0.012*	0.015	0.015	0.027	0.027	0.024	0.024
	(0.032)	(0.005)	(0.032)	(0.032)	(0.031)	(0.031)	(0.032)	(0.032)
SOE			1.734***	4.263				
			(0.319)	(2.253)				
CORRUPTION × SOE				−0.418				
				(0.380)				
PRIVATE					−0.269***	−1.779**		
					(0.088)	(0.725)		
CORRUPTION × PRIVATE						0.256**		
						(0.124)		
FDI							0.204**	1.712**
							(0.092)	(0.749)
CORRUPTION × FDI								−0.256**
								(0.128)
Industry dummies	NO	YES	YES	YES	YES	YES	YES	YES
No. Firms	252,762	252,762	252,762	252,762	252,762	252,762	252,762	252,762
No. Obs.	493,477	493,477	493,477	493,477	493,477	493,477	493,477	493,477

Note: Constants are excluded for brevity. Robust standard errors are in parentheses.
*, **, and *** denote significance at the 10%, 5% and 1% level, respectively.

dependent variable itself. A number of specification tests, including the Durbin-Wu-Hausman test for endogeneity, the Sargan test for over-identification restrictions, and the Hansen-J statistics for under-identification restrictions are performed to ensure that the model is well specified. We employ the tenure of the Secretary of the Communist Party Committee as the provincial level measured by the number of months the Secretary has been in office (TENURE), and the dummy indicating that there was a switch in the provincial leadership in a given year (SWITCH) as the two instruments. The length of the provincial leader has been suggested to be associated with provincial governance quality in the way that a short tenure may create more incentives for the leader to pursue rent extraction, engage in corrupt activities and neglect management practices (Tran, 2019), thereby exacerbating the severity of corruption. The higher frequency of switch represents short tenure and the new leader's relatively incomprehensive knowledge of local administration and management might temporarily lead to intensified corruption severity (Nguyen, Mickiewicz, & Du, 2018). Next, we control for endogeneity bias further by using the dynamic GMM estimation. Additionally, following

the method of Arellano and Bond (1991), we adopt the two-step system GMM estimator with the use of a combination of internal IVs, external IVs, and suitable lag of the endogenous corruption variable.

Overall, while the results of the IV approach lend some support to our specification reported earlier, it appears that panel fixed-effect models provide more robust and consistent empirical results. Specifically, despite a number of econometric techniques being adopted to control for the endogeneity bias, including the use of the IV-2SLS, dynamic GMM and two-step system GMM estimators with alternative IVs, different lag structures and time periods, the results hardly appear to be consistent across all specifications. In addition, the specification tests (i.e., Durbin-Wu-Hausman test, Sargan test, Hansen-J statistics, AR (1) and AR (2) tests) rarely indicate that the models are well-specified. In this context, although one might argue that fixed-effect estimators cannot control for endogeneity bias completely, since the results for the main variables of interest are quantitatively similar to those attained from IV-2SLS and GMM models, we are convinced that endogeneity is not a major problem that drives our results to estimation bias.

With regard to the specification to predict firm failure, we estimate the Hazard Model (2) under different distributional assumptions for the baseline hazard function, including Exponential, Weibull and Log-logistics. The regression results are largely similar to the results using the Cox proportional hazard model, regardless of the specification being employed. Therefore, this reinforces our finding that corruption has an adverse effect on the survival of new firms.

Furthermore, following Jiang and Nie (2014) and Tran (2019), we employ alternative proxies for firm performance. Specifically, we use ROI (return on investment), ROS (return on sales), and revenue growth as indicators of firm performance and apply the same regression specifications. While these tests provide some support for our findings, the results are less significant than the results reported using ROA as a performance indicator.

For the sake of brevity, these results are not reported here. However, they are available upon request.

6. Conclusion

This paper contributes to the growing body of research examining the corruption−entrepreneurship nexus by providing empirical evidence on the effects of corruption on the performance of new firms. Using a large sample of firms in Vietnam, a transition economy, our study reveals that corruption exerts significantly negative effects on both firm performance and sustainability. We also find that corruption is more detrimental to new firms compared to the more mature firms, probably because new firms with insufficient resources, business skills and expertise might be exposed to an excessively high level of costs and risks in a corrupted environment, leading to deteriorated performance and a higher rate of failure. Our study further shows that corruption is less deleterious to new FDI and state-owned firms. On the contrary, corruption imposes more harmful effects on the performance and survival of private domestic firms.

Our results provide implications for policymakers and regulators in transition economies, who are trying to establish a conducive environment for the development of new businesses, by showing that corruption is a major obstacle that might deteriorate the performance and sustainability of newly established firms significantly. Corruption creates a condition that favours new state-owned and new foreign direct investment (FDI) entrants, while hindering the performance of new firms in private sectors, suggesting that corruption might distort the business environment and lead to a reduction in the overall efficiency in the economy. As a result, increased government attention and efforts should be made to design more effective and rigorous anti-corruption measures to ease the way of doing business further and enhance the viability and economic significance of the new private firms. Our results also suggest that ensuring adequate financial resources, knowledge and skills for dealing with corruption is a feasible way to promote and sustain the businesses of new private firms in transition economies.

Declaration of Competing Interest

There is no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bir.2020.05.006.

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