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Corruption, Types of Corruption and Firm Financial Performance: New Evidence from a Transitional Economy

Huong Van Vu[1,2] · Tuyen Quang Tran[3] · Tuan Van Nguyen[4] · Steven Lim[1]

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Abstract Using a nationwide survey of provincial institutional quality and a sample of private manufacturing small and medium scale enterprises (the SMEs), this paper contributes to the literature by considering for the first time the effects of corruption on the financial performance of Vietnamese private SMEs. Interestingly, contrary to previous findings, we find that corruption when measured by a dummy variable, does not affect firms' financial performance after controlling for heterogeneity, simultaneity and dynamic endogeneity. However, the intensity of bribery and the majority of the forms of corruption were found to have negative impacts on firms' financial performance. Hence, a typical approach using only a dummy variable for bribery might not adequately evaluate the impact of bribe intensity or even ignores the negative impacts of some types of bribes on firms' financial performance. The findings suggest that anti-corruption measures are vital for the development of the Vietnamese private SMEs.

Keywords Corruption · Financial performance · SMEs · Institutional quality · Vietnam

✉ Huong Van Vu
huongvu@waikato.ac.nz

✉ Tuyen Quang Tran
tuyentq@vnu.edu.vn

[1] Department of Economics, University of Waikato, Hamilton, New Zealand

[2] Academy of Finance, Hanoi, Vietnam

[3] Faculty of Political Economy, VNU University of Economics and Business, Hanoi, Vietnam

[4] Faculty of Economics and Business Administration, Dalat University, Da Lat, Vietnam

Introduction

The linkage between corruption and firm performance has been widely discussed in the literature (e.g. Fisman and Svensson 2007). Theoretically, the effect of corruption on firm performance cannot be explained or predicted by a single extant theory. On the one hand, corruption may be harmful to firms in the long-term. For instance, the costs of corruption can include the erosion of critical resources such as the reputation and culture of firms, the efficient allocations of resources and the motivation for firms' innovation (Hung 2008; Lou 2002). These costs may lower or drive profit away from firms, and result in talent, technology and innovation not being sufficiently valued. As pointed out by Murphy et al. (1993), firms are disincentivized to provide investment for growth and improve productivity. Corruption is considered as 'sand-in-the-machine' (Ades and Di Tella 1996). In addition, some argue that corruption prevents the entry of new firms because incumbents tend to exploit their existing corrupt relationships, and corrupt officials try to delay transactions to extract more bribes from public service users (Rose-Ackerman 1997). Consequently, public resources are misallocated to those offering the highest bribes, not to who can offer the best value for money for society (Jain 2001).

By contrast, the above-mentioned views have been challenged by other perspectives, which imply that corruption allows firms to achieve aims or to overcome bureaucratic processes and unclear or complex regulations (e.g. Lui 1985). As a result, firms may save time and conduct business activities more speedily or "grease the wheels", all of which ultimately may promote growth and improve firms' financial performance (Vial and Hanoteau 2010). Paying informal costs can be also considered as a type of investment in networks or social capital (De Jong et al. 2012). And this investment, in

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turn, may help firms overcome the challenges of entering a new market, and facilitate firms' efforts to achieve higher financial performance.

In another approach, firms' corruption behaviour is explained by institutional theory. This is considered as one of the most popular perspectives in transitional economies (e.g. Hoskisson et al. 2000; Wright et al. 2005). This approach indicates that corruption may not affect firm efficiency because paying bribes is simply an entry cost of firms to join an established game and facilitate their survival in their environment (North 1990). When neighbouring firms pay informal costs, this places pressure on other firms to follow their behaviours. As a result, corruption may have little impact on their performance.

In light of the theoretical perspectives and discussions above, empirical research on this topic has been conducted in different countries. Preliminary studies on the effects of corruption on economic efficiency used cross-country macro data (e.g. Pierre-Guillaumeméon & Sekkat 2005). Nevertheless, using aggregated data cannot control for firm heterogeneity that can potentially affect firm performance (Kasahara and Rodrigue 2008). Furthermore, Halpern et al. (2005) show that the omitted variables and reserve causality bias are other problems for macroeconomic studies.

Recent research, using micro-level data, has emphasised the relation between corruption and growth at the firm level (e.g. Faruq et al. 2013). However, the findings are inconclusive. For instance, De Rosa et al. (2010) examined the effect of corruption on firm productivity using a sample of 21 Central and Eastern Europe countries. Their research finds that for the whole sample, while the bribe tax has a negative effect on firm-level productivity, it is not the case for the time tax.[1] They also find bribery more harmful for productivity in countries where corruption is wide spread and the legal framework is weaker. Similarly, Lau et al. (2013) investigated how "experience-based" corporate corruption influences stock market volatility in 14 emerging markets.[2] They find that countries with higher corruption tend to have less volatile stock markets, even after controlling for firm characteristics, liquidity and maturity of the markets and other economic variables.

By contrast, a study by Lau et al. (2013) using a cross-country analysis of 57 countries from the Europe and Central Asia region reveal that corporate corruption are positively associated with the number of patents applications. In addition, other empirical studies (e.g. Cheung et al. 2012) show that bribery activities bring about benefit as well as create costs to firms in several developed countries.

It is noted that while there are a large number of empirical studies about the effect of corruption on firm productivity and growth, little research has done on the effect of corruption on financial performance (Donadelli et al. 2014). Consequently, it is not clear if the benefits of corruption outweigh the costs or vice versa in terms of financial performance. Furthermore, although a few studies on this general corruption topic have been conducted in Vietnam (e.g. Nguyen and Van Dijk 2012), to the best of our knowledge, there is no empirical evidence on the impact of corruption on the financial performance of Vietnamese firms. Hence, our study is expected to provide the first evidence of the impact of corruption on firm financial performance in the Vietnamese market.

It is also noted that in most previous studies about the relationship between corruption and firm performance, bribery is measured as a dummy variable which may not adequately capture bribe intensity. Furthermore, different types of corruption can create various costs and benefits, and hence have different effects on firm financial performance. In our study, we go beyond the extant literature by examining the effect of bribe intensity and that of various types of corruption on firms' financial performance.

In terms of methodology, several empirical challenges arise when considering the linkage between corruption and firm financial performance. These include the unobservable characteristics of firms and the endogeneity of explanatory variables. More importantly, the consideration of the determinants of firm financial performance has been challenged in the recent literature by the presence of potential dynamic endogeneity. This can be understood as the past firms' financial performance affecting the current firms' financial performance (Wintoki et al. 2012). Following Wintoki et al. (2012), we overcome these problems by using two-step system dynamic panel GMM models.

Interestingly, contrary to the many findings of previous studies, we find that corruption as measured by a dummy variable does not affect firms' financial performance after controlling for heterogeneity, simultaneity and dynamic endogeneity. This finding supports the viewpoints of institutional theory and reflects the fact that corruption is widespread in Vietnam. Accordingly, engagement in corruption is considered as an entry fee and not related with firm financial performance. However, bribe intensity and the majority of various types of corruption have negative impacts on firms' financial performance.

The rest of this paper is structured as follows. The next section presents the background of the study. Data and methodology are presented in the third section, and the following section displays empirical results. The last section contains the conclusion and summary findings

[1] Time tax reflects the required time that the managers of firms spend complying with government regulations (De Rosa et al. 2010).

[2] The World Business Environment Survey interviewed managers from more than 9000 firms in 1999–2000. Respondents were asked: "is it common for firms in your line of business to have to pay some irregular "additional payments" to get things done?".

Background of the study

Over the close to 30 years of implementing the renovation policy, the Vietnamese economy has advanced from a poor country to become a middle-income country. Economic growth was high with an annual average GDP growth rate of 6.8 % during the period 1986–2009 (Le 2010). The GDP per capita growth of low and middle-income countries was always lower than that in Vietnam during the period 1988–2006 (Markussen et al. 2012). Thanks to high success in economic growth and development, Vietnam has also been very successful in poverty reduction with a fall in the poverty rate from nearly 60 % in the early 1990s to 20.7 % in 2010 (World Bank 2012).

It is noted that higher economic growth often goes together with a lower level of corruption (Bai et al. 2013). However, this may not be the case in Vietnam. In spite of the anti-corruption and anti-waste laws and various anti-corruption campaigns, recent studies on corruption in Vietnam (e.g. Nguyen and Van Dijk 2012) show that corruption remains widespread. Paying bribes to public officials still remains a major challenge when doing business, insofar as both the frequency and size of bribes have remained at relatively high levels (Malesky 2009). According to transparency international (TI), the Vietnamese ranking was very low at 123 out of 179 countries in 2008. Despite the government's anti-corruption efforts, Vietnam has made very little progress in the corruption rankings. Indeed, the recent report in 2014 shows that Vietnam achieved a score of 3.1 out of 10 (or 116 out of 177 countries).

Also, for Vietnam, there are big gaps between the formal institutions documented in laws and the enforcement capacity and compliance of the local authorities. This is because provinces are quite autonomous in practicing policy reforms. As a result, they are free to implement and deploy central laws in their own ways (Malesky and Edmund 2004; Malesky 2008). Furthermore, the development in institutional quality across provinces has been uneven. For example, while several provinces lag behind, others witness a significant improvement in economic governance and business investment (Malesky and Edmund 2007). In fact, vast differences in initial conditions and economic development seem to further enlarge the gaps. This situation makes Vietnam an interesting case to study.

Data sources and methodology

Data sources

Data from two sources will be utilised in the current study. The first source is from the surveys of small and medium scale enterprise surveys in Vietnam conducted every 2 years in 2005, 2007, 2009 and 2011, respectively. The surveys are the result of collaboration between the Institute of Labour Science and Social Affairs, the Central Institute for Economic Management and the University of Copenhagen. These surveys, sponsored by the Danish International Development Agency, used similar questionnaires and covered both new entries and "repeat" private manufacturing firms in ten provinces of three regions (South, Central and North) in Vietnam.

The surveys collected information on firms' activities, including numerous indicators such as firm characteristics, location, industries and especially detailed information about corruption activities at the firm level. All types of private firms and mostly manufacturing sectors were covered in the sample. In order to create a panel dataset through the research period, the ID of firms is used for firm identifiers to append data (e.g. Rand and Tarp (2012); Vu et al. (2014).

The second data source is the surveys of the Vietnam Provincial Competitiveness Index (PCI) in the corresponding years as the first source (that is, 2005, 2007, 2009 and 2011). The PCI surveys were conducted by the Vietnam Competitiveness Initiative and the Vietnam Chamber of Commerce and Industry to evaluate the institutional quality of provincial governments. This included nine indexes, namely,: (i) entry costs; (ii) land access; (iii) transparency and access to information; (iv) time costs and regulatory compliance; (v) informal charges; (vi) bias towards state-owned sector; (vii) private sector development services; (viii) labour training and (ix) legal institutions.[3]

Combining the first and second sources has created a unique panel dataset (at both firm and provincial levels) that allows us to evaluate not only the impact of corruption at the firm level, but also the effects of institutional quality at the provincial level, on firms' financial performance as proxied by ROA (Return on Assets).

A common problem with time-variant data is that it is often expressed in current prices. Therefore, our data on current variables are deflated to 1994 prices using the GDP deflators to avoid biases that might arise because of inflation. More specifically about the dataset, the statistical description of the main variables in our regression estimations is displayed in Table 1. The dependent variable is firm financial performance, measured as ROA. As shown by Table 1, this index seems to not change much through the research period. Corruption is the main variable of interest. The bribery incidence decreased considerably from 40.5 % in 2005 to 26 % in 2007. This is consistent with the decreasing trend for this period shown in Rand and Tarp (2012) and can be explained by the effect of anti-

[3] The definitions of these sub-indicators are presented in Appendix Table 5.

Table 1 Summary statistics for the main variables in the model

Variable	2005[a]		2007		2009		2011	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ROA	0.203	0.297	0.237	0.32	0.236	0.313	0.211	0.295
Bribe	0.404	0.49	0.262	0.44	0.34	0.47	0.38	0.48
Bribe intensity	0.002	0.008	0.0017	0.015	0.0013	0.018	0.0011	0.004
Paying bribe for getting connected with public services	0.147	0.35	0.041	0.199	0.066	0.24	0.101	0.301
Paying bribe for getting licences and permits	0.02	0.14	0.006	0.078	0.024	0.155	0.030	0.172
Paying bribe for dealing with tax and tax collectors	0.092	0.29	0.054	0.226	0.093	0.290	0.116	0.32
Paying bribe for gaining government contracts	0.062	0.241	0.041	0.20	0.036	0.186	0.026	0.159
Paying bribe for dealing with customs	0.013	0.114	0.010	0.102	0.02	0.14	0.014	0.118
Paying bribe for other reasons	0.067	0.25	0.108	0.311	0.101	0.301	0.093	0.291
Firm age (log)	2.176	0.765	2.35	0.711	2.428	0.728	2.38	0.675
Firm size (log)	2.02	1.104	2.05	1.11	2.05	1.13	1.92	1.12
Innovation	0.667	0.471	0.481	0.49	0.448	0.497	0.441	0.496
Leverage	0.112	0.337	0.104	0.227	0.10	0.237	0.076	0.176
Institutional quality at province level								
Entry cost	7.18	0.825	7.62	0.716	8.22	0.354	8.62	0.29
Land access	5.32	0.783	5.75	0.802	5.55	0.682	5.69	0.879
Transparency	5.805	0.843	6.07	0.792	5.9	0.333	5.95	0.43
Time cost	4.79	0.417	6.58	0.829	6.10	0.523	6.11	0.68
Informal charge	5.83	0.539	6.15	0.608	5.33	0.549	6.3	0.903
Proactive	4.75	1.27	4.96	1.24	3.76	0.837	4.19	0.987
Private act	5.64	1.38	5.87	1.93	6.29	1.21	5.67	1.37
Worker training	5.64	1.42	5.27	1.02	4.87	0.84	5.19	0.46
Legal framework	3.81	0.808	3.99	0.714	5.21	0.536	5.789	0.34
PCI	53.69	7.13	56.73	5.604	56.57	3.66	59.43	3.24
Observations	2578		2442		2499		2405	

[a] Provincial level indexes in 2006 instead of 2005 are used in this research because of two reasons. First, our data are investigated in 10 provinces. However, PCI from 2005 does not survey from some provinces in our sample. In addition, the firm-level survey in 2005 was conducted from late October onwards. Thus using PCI of 2006 does match quite well with firm-level data of 2005

corruption law passed in 2005 and the establishment of the National Anti-Corruption Committee in 2006. However, the corruption index experiences a significant increase again through rest of the study period. Our data also provide information on what the purposes of corruption are. As shown by the data, while the majority of paying bribes for different types of activities increases through the research period, firms use less money for paying bribes to gain government contracts, with the mean of the variable at 6.2 and 2.6 %, respectively, in 2005 and 2011.

Among firm characteristic variables, while the average number of employees slightly decreases from 2.02 to 1.92, the age of the firm increases in our sample in the same period. A decreasing trend is witnessed for innovative activities of firms in the period 2005–2011.

Regarding institutional factors at the provincial level, there are nine main sub-indexes reflected in the research sample. Several indicators increase significantly through the sample period, while other indices decrease slightly. For example, while entry costs increase significantly from 7.19 in 2005 to 8.2 in 2011, the index of labour training among provinces witnesses a slight decrease in the research period.

Table 2 provides partial correlation matrix, considering the unconditional relationships among variables. Initial evidence shows that there is a negative relationship between the financial performance of firms and corruption, and this tentatively supports the 'sand-in-the-machine' view of corruption.[4] In addition, firm characteristics such as innovation and leverage are also found to have a statically significant correlation with firm financial performance. While the correlation coefficient for innovation is 0.075, the coefficient for leverage is higher with 0.08 at the 5 % level of significance.

[4] After replacing bribe by bribe intensity or types of corruption, negative and significant relationships between bribe intensity or types of corruption with firms' financial performance are also observed.

Table 2 Correlation matrix between corruption and firm financial performance

Variables	1	2	3	4	5	6	7	8
1.ROA	1.00							
2. Bribe	−0.123*	1.00						
3.Firm size in log	−0.195*	0.365*	1.00					
4. Firm age in log	−0.033*	−0.132*	−0.151*	1.00				
5. Leverage	0.082*	0.075*	0.185*	−0.092*	1.00			
6. Innovation	−0.075*	0.188*	0.282*	−0.107*	0.068*	1.000		
7. Lag ROA	0.169*	−0.072*	−0.136*	−0.00	−0.002	−0.056*	1.00	
8. PCI	−0.024*	0.037*	0.069*	−0.057*	0.017	−0.080*	−0.008	1.00

* Significant at the 5 % level or better

Methodology and estimation issues

Applying a dynamic panel modelling approach to deal with the dynamic nature of economic processes is becoming increasingly important in recent years (Flannery and Hankins, 2013). Wintoki et al. (2012), for example, document that the corporate governance–firm financial performance relationship is dynamic in nature; that is, current firm performance and other firm-specific characteristics are driven by past performance. This dynamic nature is considered as a potential source of endogeneity, which makes traditional static models problematic (Flannery and Hankins, 2013; Wintoki et al. 2012). To control for "dynamic endogeneity", empirical models using firm performance as a dependent variable must be examined in a dynamic framework in which lagged dependent variable(s) are employed as explanatory variable(s) (Wintoki et al. 2012).

Technically, the inclusion of lagged dependent variables on the right-hand side of the empirical models allows empiricists to control for unobserved historical factors which have potential influences on current firm performance, thus reducing omitted variable bias (Wooldridge 2009). Moreover, even if the estimated coefficients on lagged dependent variables are not of direct interest of the empiricists, "allowing for dynamics in the underlying process may be crucial for recovering consistent estimates of other parameters" (Bond 2002, p. 142). Hence, in order to allow comparison, our empirical specification is built upon previous studies (e.g. Wintoki et al. 2012) and specified as below:

$$Y_{it} = \alpha_0 + \sum_{s=1}^{k} a_s Y_{it-s} + \delta_m \text{Corruption}_{,it} + \beta_k Z_{k,it} + \text{year dummies} + \text{industry dummies} + \vartheta_{it} \quad (1)$$

where $\vartheta_{it} = \mu_i + \omega_t + \varepsilon_{it}$. In the regressions, Y_{it} is the financial performance (as measured by ROA) of firm i in year t, and α_s is the estimated coefficient on the lagged dependent variables. Corruption is widely defined as the abuse of power by public officials for private gains (Svensson 2005). This is the main interest variable in the model. In this study, following Rand and Tarp (2012), we measure corruption as a set of variables. First, it is measured as a dummy based on the question if firms have to pay informal payments. In addition, while bribe intensity is measured as the ratio between the amounts of informal payment to total revenue, the types of bribe are measured on the basis of the question what are the purposes of the bribe payment or communication fee.

Z is a vector of firm-level explanatory variables (firm size, firm age, innovation and leverage) used in the model as guided by previous studies (e.g. Donadelli et al. 2014; Fisman and Svensson 2007). We also control for potential influences arising from differences across industries through the use of dummy variables for industry classification. μ_i represents time-invariant unobserved firm characteristics; ω_t denotes time-specific effects which are time-variant and common to all firms. These time-specific effects are captured by year dummy variables; ε_{it} is the classical error term.

Following prior studies on firm performance (e.g. Nguyen et al. 2014; Wintoki et al. 2012), the information from the past can be captured sufficiently by two lags of the dependent variable. To explore this, we ran a specification in which the current financial performance is a dependent variable regressed on two lags of past performance, and other covariates as in Eq. (1). Using this formulation, an insignificant effect of Y_{it-2} on current firm financial performance was found. Hence, this suggests that a one-year lagged dependent variable as an explanatory variable in a first-order autoregressive [AR(1)] structure is enough to control for the potential dynamic endogeneity. This is in line with Zhou et al. (2014) who argue that an AR(1) structure appears to be unavoidable when almost all panel datasets used in corporate finance research are short. The AR(1) panel model specification is displayed in detail as follows:

$$Y_{it} = \alpha_0 + \alpha_1 Y_{i,t-1} + \delta_m \text{Corruption}_{,it} + \beta_k Z_{k,it} + \text{year dummies} + \text{industry dummies} + \vartheta_{it}. \quad (2)$$

Furthermore, failing to consider institutional quality factors may bias the impact of corruption on firm performance (Faruq et al. 2013; Halkos and Tzeremes 2010).

Corruption can "grease or sand the wheel" if the institutional quality is good or bad (Méon and Weill, 2010). Hence, indexes of institutional quality at the provincial level ($P_{m,jt}$) are controlled for in the model.

$$Y_{it} = \alpha_0 + \alpha_1 Y_{i,t-1} + \delta_m \text{corruption}_{,it} + \beta_k Z_{k,it} + \gamma_m P_{m,jt} + \text{year dummies} + \text{industry dummies} + \vartheta_{it} \quad (3)$$

Regarding the estimation approach, in the presence of the AR(1) structure in Eq. (2), the pooled OLS (OLS) and the OLS with fixed-effects (FE) methods will provide inconsistent estimations (Flannery and Hankins 2013; Nickell 1981; Wintoki et al. 2012). Some studies use the traditional IV approach. However, findings of a set of external instrumental variables seem infeasible when almost all independent variables are considered not to be exogenous. In order to correct for this inconsistency and these challenges, we use the two-step system generalised method of moments estimator (System GMM) proposed by Blundell and Bond (1998). This estimator is superior to the OLS or FE methods in controlling for time-invariant unobserved heterogeneity across firms, simultaneity, and dynamic endogeneity (Blundell and Bond 1998; Wintoki et al. 2012).

Empirical results and discussions

As a benchmark, preliminary regression results are obtained by using the OLS approach for pooled data. Column 1 of Table 3 shows a negative significant linkage between bribe and firm financial performance at the 1 % level of significance. The estimated coefficient tells us that firms with corrupt behaviour have a lower financial performance than those without. This is in line with recent findings by Donadelli et al. (2014) on European firms, but contrasts with the results from East Asian studies where corruption has a positive effect (e.g. Wang and You (2012) for Chinese firms). Such mixed results imply that our initial investigation by OLS can be biased as a consequence of unobservable factors or the potential endogeneity problem of corruption and other variables.

With attempts to control for time-invariant unobserved features and overcome the above challenges, we conduct the system GMM as guided by Wintoki et al. (2012). It is noted that the OLS and FE methods may gain more efficient estimations than the system GMM if explanatory variables are not endogenous. Hence, a Durbin–Wu–Hausman test is implemented for all independent variables as a group to examine if they are actually endogenous. Following Schultz et al. (2010), the test is conducted on the levels equation of firm performance and corruption. One-year lagged differences of explained covariates such as Δ ln Y_{it-1}, Δ insize$_{i-t1}$, Δ bribe$_{it-1}$ and Δ leverage$_{it-1}$ are considered as instrumental variables with year dummies and firm age considered as exogenous variables. The results of the test show that the null hypothesis is rejected at traditional level of significance (1 %). The endogeneity of regressors is of concern, and hence it is necessary to apply the system GMM estimator in this study. We also check the validity of the system GMM estimation by using the Hansen–J test for over-identification. The results are displayed in the last row of Table 3. The P values of the Hansen–J test are 0.135, 0.211 and 0.117, respectively, suggesting that the instrumental variables employed in our models are valid.

As reported in column 2 of Table 3, the impact of corruption on firm financial performance becomes insignificant after controlling for unobservable characteristics and dynamic endogeneity. This finding provides support for the institutional theory perspective and reflects the fact that corruption is widespread among firms in Vietnam and, hence, participation in corruption activities does not provide financial efficiency for firms.

However, as discussed previously, measuring bribery as a dummy does not capture the level of corruption well. Hence, we replace bribery by bribe intensity. As shown by column 3 of Table 3, bribe intensity has a negative effect on firms' financial performance regardless of which model is used. Specifically, when bribe intensity increases 1 %, the firm financial efficiency decreases 0.147 %, keeping other factors constant. This finding implies that previous studies using bribery as a dummy variable can mask the real impact of corruption on firm performance.

Looking more closely, we explore the effects of different types of corruption on firms' financial performance. Our results show that while some types of corruption do not affect firms' financial performance, we find that costs that come from both the payment to public officials to obtain licences and permits, as well as informal payment to tax collectors, are the main contributors to the negative impacts of level of corruption on firms' financial efficiency. However, interestingly, paying informal costs for public services has a positive impact on firm financial performance at level of significance (10 %). This may be because paying informal costs for public services helps enterprises save time and costs in involving public administration, and hence ensures them gaining financial efficiency.

In terms of firm-level characteristics, as expected, innovation has a positive impact on firm financial performance. For example, column 2 of Table 3 shows that innovators have 2.3 % higher financial performance than non-innovators, keeping other things constant. The results are consistent with most findings in the literature (e.g. Koellinger 2008). In addition, while firm size and firm age have an insignificant impact on firm financial performance, leverage, as measured by the ratio between total debts over total assets, exhibits a positive association with firm financial performance regardless of which model is used. It may be that firms with higher

Table 3 Dynamic models of corruption and firm financial performance

Variables	Model 1		Model 2		Model 3	
	Pooled OLS (1)	GMM (2)	Pooled OLS (3)	GMM (4)	Pooled OLS (5)	GMM (6)
lagROA	0.0596**	0.0685*	0.0603**	0.0678*	0.0597**	0.0692*
	(0.020)	(0.030)	(0.020)	(0.030)	(0.020)	(0.030)
Bribe	−0.0352**	−0.0015				
	(0.008)	(0.010)				
Bribe intensity			−0.4018**	−0.1474*		
			(0.131)	(0.070)		
Bribe for public services					−0.0227	0.0271+
					(0.014)	(0.016)
Bribe for licences and permits					−0.0671**	−0.0662**
					(0.020)	(0.024)
Bribe for tax and tax collectors					−0.0627**	−0.0297*
					(0.011)	(0.013)
Bribe for government contract					−0.0334*	−0.0098
					(0.017)	(0.022)
Bribe for dealing with customs					0.0605+	−0.0325
					(0.036)	(0.040)
Bribe for other reasons					−0.0233+	0.0001
					(0.012)	(0.014)
Firm size in log	−0.0400**	−0.0028	−0.0446**	−0.0021	−0.0420**	−0.0103
	(0.005)	(0.011)	(0.005)	(0.011)	(0.005)	(0.009)
Firm age in log	−0.0239**	−0.0077	−0.0230**	−0.0062	−0.0238**	−0.0057
	(0.006)	(0.008)	(0.006)	(0.008)	(0.006)	(0.008)
Leverage	0.1484**	0.1347**	0.1482**	0.1242*	0.1463**	0.1428**
	(0.026)	(0.049)	(0.026)	(0.050)	(0.026)	(0.047)
Innovation	0.0004	0.0232*	−0.0008	0.0253*	0.0019	0.0231*
	(0.008)	(0.010)	(0.008)	(0.011)	(0.008)	(0.010)
Constant	0.4020**	0.2310**	0.4013**	0.2141**	0.4039**	0.2175**
	(0.024)	(0.055)	(0.024)	(0.056)	(0.024)	(0.048)
Observations	6,031	6,031	6,031	6,031	6,031	6,031
R^2	0.083		0.081		0.085	
Durbin–Wu–Hausman test for endogeneity of regressors (P value)		0.0005		0.0004		0.0026
Hansen–J test of over-identification (P value)		0.135		0.211		0.117

Models include industry dummies, year dummies and firm fixed-effects. Asterisks indicate significance at 10 % (+), 5 % (*) and 1 % (**). Robust standard errors in parentheses. The number of observations is 6,031. Following Schultz, et al. (2010) and Wintoki et al. (2012), firm age and year dummies are considered to be exogenous

leverage face higher pressure to improve efficiency to gain higher productivity, and to improve the financial performance of firms. This finding also supports the argument of González (2013) who suggests that a firm with higher financial debt can force managers into value-maximising decisions.

Regarding the role of past firm financial performance, the estimated results show a significant and positive impact on current performance regardless of which model is used. This finding is in line with recent studies (e.g. Wintoki et al. 2012). These results also imply that past firm financial performance is a vital variable in considering the dynamic nature of the factors affecting firm financial performance; ignoring this variable in the model can result in researchers failing to capture the real impacts of corruption on firms' financial performance.

When conducting the system GMM estimation, we follow the recommendation by Roodman (2009) and apply the difference-in-Hansen tests to the instrumental variable subsets to make sure that they are all exogenous. The null hypothesis of the tests is that a specific instrument subset is

Table 4 Difference-in-Hansen tests of exogeneity of instrumental variable subsets

Tested instrument subsets	Test statistics (χ^2)	Degrees of freedom	*P* value
Panel A: model 1			
All the GMM-type instruments for the levels equation as a group	62	68	0.682
The GMM-type instruments for the transformed equation based on lagged levels of ROA	3.12	3	0.373
The GMM-type instruments for the levels equation based on lagged differences of ROA	1.42	2	0.491
Standard instruments	5.01	3	0.171
Panel A: model 2			
All the GMM-type instruments for the levels equation as a group	53.44	68	0.902
The GMM-type instruments for the transformed equation based on lagged levels of ROA	2.57	3	0.464
The GMM-type instruments for the levels equation based on lagged differences of ROA	1.5	2	0.472
Standard instruments	4.84	3	0.184
Panel A: model 3			
All the GMM-type instruments for the levels equation as a group	85.41	83	0.406
The GMM-type instruments for the transformed equation based on lagged levels of ROA	4.14	3	0.247
The GMM-type instruments for the levels equation based on lagged differences of ROA	0.82	2	0.663
Standard instruments	8.52	3	0.036

jointly valid. To be precise, we test the validity of the four instrument subsets used in all three models, 1, 2 and 3, namely: (i) all the GMM-type instruments for the levels equation as a group; (ii) the GMM-type instruments for the transformed equation based on lagged levels of the dependent variable; (iii) the GMM-type instruments for the levels equation based on lagged differences of the dependent variable and (iv) standard instrumental variables. The results reported in Table 4 indicate that all the subsets of instrumental variables are econometrically exogenous.

As a final step, we check the robustness of results by posing several scenarios. First, our results can be biased by ignoring institutional quality at the province level. Hence, in further regressions, provincial institutional quality indexes are added and the results are reported in Appendix Table 6. Second, we replace aggregated institutional quality index at the provincial level by the sub-indicators to evaluate institutional quality in detail. However, the negative effects of bribe intensity and types of corruption on firms' financial performance are still recorded. Furthermore, one might worry that larger (i.e. medium-sized) firms are driving the findings as opposed to smaller firms. In order to explore this, we exclude the medium-sized enterprises and re-estimate with the same specifications. However, the regression results do not change much in the quality and are available on requests. Finally, we calculate the relationship without including innovation as an independent variable with, arguing that innovation may be endogenous and, hence, controlling for it can bias the results. Although the estimated coefficient changes slightly, the overall interpretation of the results does not change.

Conclusion

As a contribution to the small but rising evidence of the effect of corruption on firm financial performance, this study considers for the first time the impact of corruption on firm financial performance at both the firm and provincial levels in Vietnam. In contrast to the findings of many previous studies, we found that the incidence of bribery does not affect firm financial performance, but bribe intensity has a negative effect, when dynamic endogeneity and unobservable characteristics are controlled for. Hence, a typical approach using only the dummy variable of bribery might not adequately reflect the impact of bribe intensity. In addition, this paper provides additional evidence on the impacts of various types of corruption. While some kinds of corruption do not affect firm financial performance, firms paying informal costs to obtain licences and government contracts have negative impacts on the financial performance of enterprises. However, firms paying bribes for public services may have a higher financial performance compared to their counterparts without doing so. These results imply that the various types of corruption in Vietnam have different impacts on firms' financial performance and various anti-corruption measures should also be considered to counter such types of corruption.

Regarding traditional firm characteristics, the empirical results are generally consistent with other international empirical studies. For example, past performance is found to have a positive effect on firm financial performance, suggesting that the link between corruption and firm financial performance should be investigated in a dynamic

framework. In addition, while firms with more years in business do not have a higher financial performance than their counterparts, leverage has a positive association with firm financial performance. Furthermore, it is not surprised that innovators who have flexible policies are able to respond quickly to market demand and are marked by higher financial performance than non-innovators.

In terms of policy implications, the majority of the types of corruption have negative impacts on the financial performance of firms. In addition, a decrease in corruption levels is accompanied by an improvement in the efficiency of finance for private firms in Vietnam. Hence, bribe-combating actions are necessary, such as a legal framework that is clear, consistent and equal for all economic sectors.

Although this study has contributed to the understanding of corruption's effects on the financial performance of non-state manufacturing SMEs, it still has several limitations that offer opportunities for future study. For example, this study focuses only on domestic non-state manufacturing SMEs in Vietnam. Given the availability of comparable data, future work could consider large firms, firms in other ownership categories such as SOEs and FIEs, and firms in other economic sectors such as services or agriculture, in order to provide a broader understanding of the impact of corruption and types of corruption on the financial performance of Vietnamese enterprises.

Finally, our paper finds a result that is contrary to many findings of previous evidence. This can stem from using the different methodological approach followed to overcome the bias by the dynamic endogeneity, unobservable factors and other issues. Therefore, a reasonable agenda for future research is to apply elsewhere the methodology employed in this study to see whether a negative relationship between corruption and firm financial performance is found consistently beyond Vietnam.

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Appendices

Tables 5 and 6.

Table 5 Definition and measurement of variables included in the models

Explanatory variables	Definition	Measurement
ROA	The ratio between net profit and total assets	Ratio
Bribe	Whether or not firms pay informal costs	1 = yes; 0 = otherwise
Bribe intensity	The ratio between payment amount and total revenue	Ratio
Paying bribe for getting connected with public services	Whether or not firms pay bribe for getting connected with public services	1 = yes; 0 = otherwise
Paying bribe for getting licences and permits	Whether or not firms pay bribe for getting licences and permits	1 = yes; 0 = otherwise
Paying bribe for dealing with tax and tax collectors	Whether or not firms pay bribe for dealing with tax and tax collectors	1 = yes; 0 = otherwise
Paying bribe for gaining governments contract	Whether or not firms pay bribe for gaining contract of governments	1 = yes; 0 = otherwise
Paying bribe for dealing with customs	Whether or not firms pay bribe for dealing with customs	1 = yes; 0 = otherwise
Paying bribe for other reasons	Whether or not firms pay bribe for other reasons	1 = yes; 0 = otherwise
Firm age	The number of years since firms have been established	Year(s)
Firm size	Total number of labourers of firms	Number of labours
Innovation	Whether or not firms have innovative activities	1 = yes; 0 = otherwise
Leverage	The ratio between total debt and total assets	Ratio
Entry cost	The measurement of time a firm takes to register and acquire land as well as the time to receive all the necessary licences needed to start a business	Number
Land access	The measurement of the ability to access land and the security of business premises after land is acquired	Number
Transparency	The measurement of firms' ability in access to proper planning and legal documents for running their business labour and training as well as whether those documents are equitably available, whether new policies and laws are communicated to firms and predictably implemented	Number
Time cost	The measurement of how much time firms spending on bureaucratic compliance or decisions to implement local policy indices	Number
Informal charge	The measures firm perceptions of the corruption of provincial officials	Number

Table 5 continued

Explanatory variables	Definition	Measurement
Proactive	Bias towards State-Owned Sector evaluates bias in terms of incentives, policy, and access to capital of provincial governments towards state-owned enterprises, equitized	Number
Private act	Development services design their own initiatives for private sector development and have provincial services for private sector trade promotion, provision of regulatory information to firms, business partner matchmaking, provision of industrial zones	Number
Worker training	Evaluates efforts by provincial authorities to promote vocational training and skills development for local industries	Number
Legal framework	Legal institutions measure the faith that firms have that provincial courts will enforce contracts	Number
PCI	The aggregated index of measurement of ranking of economic governance in Vietnam by VCCI	Number

Table 6 Dynamic models controlled for institutional quality at provincial level

VARIABLES	Pooled OLS (1)	GMM (2)	Pooled OLS (3)	GMM (4)	Pooled OLS (5)	GMM (6)
lagROA	0.0597**	0.0687*	0.0603**	0.0678*	0.0597**	0.0694*
	(0.020)	(0.030)	(0.020)	(0.030)	(0.020)	(0.030)
Bribe	−0.0350**	−0.0021				
	(0.008)	(0.010)				
Bribe intensity			−0.4007**	−0.1517*		
			(0.127)	(0.071)		
Bribe for public services					−0.0229^{+}	0.0255
					(0.014)	(0.016)
Bribe for licences and permits					−0.0659**	−0.0648**
					(0.020)	(0.024)
Bribe for tax and tax collectors					−0.0642**	−0.0322*
					(0.011)	(0.013)
Bribe for government contract					−0.0327^{+}	−0.0105
					(0.017)	(0.022)
Bribe for dealing with customs					0.0608^{+}	−0.0337
					(0.036)	(0.040)
Bribe for other reasons					−0.0215^{+}	0.0005
					(0.012)	(0.014)
Firm size in log	−0.0395**	−0.0025	−0.0440**	−0.0015	−0.0415**	−0.0103
	(0.005)	(0.011)	(0.005)	(0.011)	(0.005)	(0.009)
Firm age in log	−0.0242**	−0.0084	−0.0233**	−0.0068	−0.0241**	−0.0064
	(0.006)	(0.008)	(0.006)	(0.008)	(0.006)	(0.008)
Leverage	0.1479**	0.1361**	0.1477**	0.1247*	0.1458**	0.1450**
	(0.027)	(0.049)	(0.026)	(0.049)	(0.026)	(0.047)
Innovation	−0.0003	0.0225*	−0.0016	0.0246*	0.0011	0.0223*
	(0.008)	(0.010)	(0.008)	(0.011)	(0.008)	(0.010)
PCI	−0.0021*	−0.0011	−0.0022*	−0.0011	−0.0023*	−0.0012
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Table 6 continued

VARIABLES	Pooled OLS (1)	GMM (2)	Pooled OLS (3)	GMM (4)	Pooled OLS (5)	GMM (6)
Constant	0.5219**	0.2987**	0.5234**	0.2825**	0.5309**	0.2910**
	(0.062)	(0.079)	(0.062)	(0.080)	(0.062)	(0.076)
Observations	6,031	6,031	6,031	6,031	6,031	6,031
R^2	0.084		0.082		0.086	
Hansen–*J* test of over-identification (*P* value)		0.132		0.219		0.115

Models include industry dummies, year dummies and firm fixed-effects. Asterisks indicate significance at 10 % ($^+$), 5 % (*) and 1 % (**). Robust standard errors in parentheses. Firm age, PCI and year dummies are considered to be exogenous

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