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Government cost and firm value: Evidence from Vietnam

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ABSTRACT

This paper investigates the relationship between government cost and firm value at the provincial level in a transitional economy. We shed further light on the question whether local government plays the role of grabbing or helping hand. We use a unique dataset covering government spending and corporate performance characteristics collected from provincial statistical yearbook and Datastream. The results show that there exists a nonlinear U-shaped relationship between local government cost and firm value. Particularly, the threshold value of provincial government spending is about 5%. Furthermore, the U-shaped nonlinear relationship is strongly evidenced in lower quantiles of firm value but not significant at high firm value quantiles, ceteris paribus. The article also offers an interesting result concerning the moderating role of state ownership. The effect of government cost on firm value is stronger for the state-owned firms at lower quantiles of firm value.

1. Introduction

Some of the most important responsibilities of governments are to promote entrepreneurship and to provide public goods including infrastructure and education. Businesses play an important role in fueling economic growth. Therefore, government could promote business performance by creating a favorable business environment for private sector. Government policy is critical in this perspective because government policy shapes the institutional environments in which businesses operate (Minniti 2008). Clearly, institutional environments are important to the business behavior (Gohmann et al., 2008).

However, the performance of government might not be the same in different countries. The issue is even more pronounced in transitional economies where institutional environments are weak. In an influential study, La Porta et al. (1999) provide evidence to support this argument. For example, this study reports that countries that are poor and use French or socialist laws exhibit inferior government performance. Consequently, the inconclusive debate concerning the role of the government in the economy is far from resolve (Nash 2017).

The direction of impact of government cost on firm performance remains open for discussion in the literature. On the one hand, high government cost may result in an improvement in public services and other aspects of the business environment. Further, increased government expenditure should improve the overall business environment leading to an increase in firm performance and firm value. On the other hand, high expenditure of local governments may simply reflect an inefficient or poorly managed system. These damage the business environment and deteriorate firm performance. Firth et al. (2013) report that higher local governmental administrative expenditures are associated with lower firm value, lower stock and financial performance as well as lower productivity. Besides, they also indicate that local governments with higher public administration expenditures have tendency to collect higher fee from companies, but spend less on social welfare and infrastructures.

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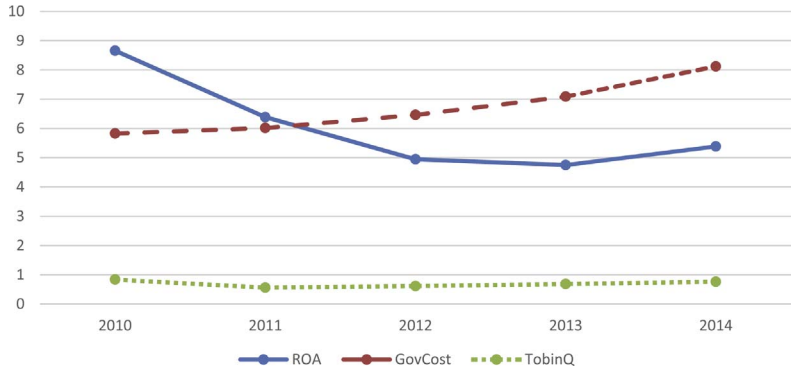

Fig. 1. Vietnam's government cost, ROA and Tobin's Q.

Motivated by the debate on the role of government in economic development (Cull et al., 2017), this paper examines the relationship between provincial government cost and firm value in a transitional economy. Specially, we shed further light on the question whether local government plays the grabbing or helping hand role. Using data on local government spending collected from the Vietnamese provincial statistical yearbook and financial data of listed firms collected from Datastream for the period 2009 − 2014, we first examine the relationship by estimating the linear regression between government cost and firm value and firm profitability. Most of previous studies focus on the role of government at the national level, our paper is one of the very few analyzing the link between local government cost and firm value.

Fig. 1 shows a summary of government cost and average firm performance in Vietnam, a small transitional economy during the period from 2010 to 2014. We observe that government cost increases over the period while the two firm performance measures have not fluctuated with the same pattern. Hence, it is important to examine the link between government cost and firm value in Vietnam. Moreover, to the best of our knowledge, our study is among the first to address this nexus in the context of Vietnam.

This figure illustrates the trend of government cost measured by administrative expenditure of local government scaled by total expenditures; firm performance measured by return on assets and firm value measured by Tobin's Q.

The paper documents some interesting findings. Firstly, we report a statistically significant positive relation between government cost and firm value. Secondly, we find a U-shape relationship between government cost and firm value. We also find that the threshold value of government spending is about 5 percent.

The results from our paper are important because higher government cost is not necessarily associated with better public services in the case of poor and inefficient management system. Further, local government tends to levy higher financial burden on private sector to cover high and inefficient expenses, resulting in lower corporate profitability and value.

Furthermore, we also find that the results remain unchanged when we conduct the quantile regressions to see if the relationship holds for different quantiles of firm value, especially lower quantiles. However, this negative effect does not occur contemporaneously but with one-year lag. These findings are accounted for potential endogeneity. These results also hold for a battery of robustness tests.

This research contributes to the existing literature in several ways. Firstly, our study offers additional empirical evidence on the relation between government cost and firm value/performance. Secondly, we find a U-shape relationship for Vietnam case, which is different from previous findings, for example, Firth et al. (2013). Thirdly, this study advances previous papers in terms of novel econometric approach. We conduct the research using the quantile regression method which controls for different quantiles of firm value to provide consistent and robust results.

The remainder of this paper is constructed as follows. Section 2 reviews the previous research in the literature. Section 3 presents data and research methodology. Section 4 discusses regression results and the paper is concluded in section 5.

2. Literature review

The important role of public sector in providing a substantial share of national GDP is undeniable. In modern economic theories, the role and function of government can be invisible, grabbing or helping. These concepts are often referred to as the invisible hand, the helping hand and the grabbing hand. *The invisible hand* view which states that the markets will work well without government intervention. *The helping hand* view argues that state intervention is important for markets to perform properly. It argues that the government will intervene to create a favorable environment to improve business performance of private sector, make markets function better. The government "helps" balance the markets by using their tools such as taxes, fees, and other incentives. It implies that public workers have willingness and ability to do their jobs (opposed to their own interest) to make the market efficiently. Moreover, the performance based political competition is another motivation for promoting firm performance in transitional economy (Chen et al., 2005; Cull et al., 2017; Xu 2011). Further, the decentralization also offers incentives for the local governments provide efficient public services and other market assistances (Cull et al., 2017; Jin et al., 2005). On the contrary, *the grabbing hand* view asserts that public sector workers act in their own interest, even in expense of business and community interest (Shleifer and Vishny 1994).

In the real world, the question whether the helping hand or grabbing hand dominates remains inconclusive. This question is even more unclear in the context of transitional economies. The direction of impact of political influence on firm value is therefore depending on the which is stronger, the grabbing hand or helping hand (Shleifer and Vishny 1994). The evidence is mixed in the literature. For example, Shleifer and Vishny (1994) report that some forms of grabbing hand such as subsidies to public enterprises and bribes from managers to politicians, place higher burden on companies. However, Cooper et al. (2010) and Faccio (2006) indicate that firms can take advantage of political connection to obtain economic benefits and other favorable privileges. Méon and Weill (2005) use a sample of both developed and developing countries and find that better governance is also associated with greater efficiency. Further, this study states that government efficiency is the aspect of governance that most robustly affects aggregate productivity.

The link between government cost and firm value is clearly dependent on whether government provides helping hand or plays grabbing hand. A number of papers in the literature support this statement, for example, Shleifer and Vishny (1994) and Firth et al. (2013) which argue that the direction of causality between firm value and governmental administrative expenses is dependent on whether marginal benefits outweigh marginal costs. More recently, Cull et al. (2017) examines the determinants of local government facilitation and report that government gravitates toward promoting efficiency, however, there is also evidence of rent-seeking.

In the one hand, the helping hand hypothesis suggests that there is a positive link between government cost and firm value because of several reasons. A clear argument is that higher administrative expenses are associated with better public services to businesses and residences and thereby, higher firm performance. Recent evidence from emerging markets suggest that the fiscal decentralization offers strong incentives for local governments to promote economic growth and corporate activities (Cull et al., 2017; Jin et al., 2005). Moreover, higher administrative expenses indicates better payments and salaries to public workers, resulting in effective services to businesses and lower corruption. In addition, good government allows firms to lower cash holdings and improve bank and trade credit financing (Allen et al., 2005; Chen et al., 2014). These helping hands promote business environment, which in turn contribute to firm performance and firm value (Lin et al., 2010). Hence, higher governmental administrative cost is associated with better corporate performance and firm value.

On the other hand, the grabbing hand hypothesis indicates a negative link between government cost and firm value. This hypothesis states that high administrative government expenses may serve as a signal of high bureaucratic public workers and inefficiencies or even high level of corruption (Aidt 2003). High government expenses may also place higher burden on business enterprises and residents in the form of taxes and fees (Jie 2006; Lin 2005). Moreover, Cull and Xu (2005) and Lin et al. (2010) report that violation of property rights by the government (for example, heavy burden taxes and fees) would reduce corporate profit reinvestment, research and development incentives and social welfares. Consequently, business environment is worsen, leading to lower firm performance and in turn firm value. Djalilov and Piesse (2016) support this argument by providing evidence confirming that government spending negatively affects profitability of banking firms in transition countries.

3. Data and research methodology

3.1. Data

This paper uses data on government spending and firm's performance characteristics for the period from 2010 to 2014. Data on government spending are collected from the *Statistical Yearbook* of 63 cities/provinces in Vietnam. Data on business performance and characteristics is collected from Datastream. The final sample consists of more than 500 listed firm on both the Ho Chi Minh City Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX).

3.2. Research methodology

To provide consistent and robust results, we utilize a number of econometric techniques. We first use the Generalized Methods of Moments to address potential problem of endogeneity. We further employ quantile regression (Koenker & Bassett Jr 1978) to determine the marginal effect of the explanatory variables across the dependent variable's distribution.

Tobin (1969) introduces the Q ratio (hereafter *Tobin's Q*) as a predictor of firm's profitable investment. Since then, *Tobin's Q* has become common in finance literature to measure firm value. According to Tobin (1969), *Tobin's Q* is the ratio which is calculated by comparing the market value of a company's equity and liabilities with its corresponding book values. The formula is as follows:

$$Tobin'sQ1 = \frac{EquityMarketValue + LiabilitiesMarketValue}{EquityBookValue + LiabilitiesBookValue}$$

It is also common to assume equivalence of the liabilities market and book value. Hence, the Tobin's Q ratio can also be calculated as follows:

$$Tobin'sQ2 = \frac{EquityMarketValue}{EquityBookValue}$$

Government cost is the administrative expenditure which is also covered by the provincial budget expenditures. In this article, the cost of government (*GovCost*), is measured by the administrative expenditure of local government scaled by total expenditures.

In addition to these two main variables, the model also employs other explanatory variables as control variables, including: *Size (*measured by the total assets of the business after taking the logarithm); *Leverage* (measured by the ratio of total debt to total equity;

leverage are winsorized at 1% and 99% levels); *SOE* (dummy variable, takes a value of 1 if the firm is state-owned and zero otherwise); *Age* (number of years since firms start listing on the stock market); *FreeFloat* (the percentage of tradable shares to total shares at the end of the prior year). *HOSE* (dummy variable, receives a value of 1 if firm is listed on Ho Chi minh Stock Exchange and receives zero for otherwise). In addition, dummy variables for year and industry are also included in the model to account the time fixed effects and the industry fixed effects.

Furthermore, this paper uses two other variables to measure firms' operating performance in order to check robustness of the results. *ROA* is the net profit divided by average total assets. *ROE* is the net profit divided by total equity.

In order to test the impact of government cost on corporate value, we employ a linear regression function which is presented as follows:

$$Tobin'sQ_{it} = \beta_1 + \gamma_1 GovCost_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 SOE_{it} + \beta_5 Age_{it} + \beta_6 FreeFloat_{it} + \beta_7 HOSE_{it} + \mu_i + \delta_t + \varepsilon_{it} \quad (1)$$

However, in transition economies like Vietnam, the role of government cost is not simply linear which implies the same effect on all values of government cost. The assumption that the constant impact of government cost on corporate value may be unrealistic. When the local administrative spending is low, the government may not be able to promote the economic incentives for firms. However, there are also cases where local governments with low administrative expenditures have small, neat and efficient administration system; that leads to the case the government cost plays a role in boosting corporate value. On the other side, when the government cost as measured by total government administrative expenditures to total local budget expenditures is high, there may also be two cases. Firstly, large administrative expenditures are the sign of a cumbersome and ineffective system, thus the government is unable to play a leading role in motivating local firms. Secondly, when government cost is large, public workers can be well compensated, reducing harassment and corruption. Therefore, it helps to create a better business environment. With these arguments, this article wants to test the nonlinear relationship between government cost and firm value. The specification is as follows:

$$Tobin'sQ_{it} = \beta_1 + \gamma_1 GovCost_{it} + \gamma_2 GovCost_{it}^2 + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 SOE_{it} + \beta_5 Age_{it} + \beta_6 FreeFloat_{it} + \beta_7 HOSE_{it} + \mu_i + \delta_t + \varepsilon_{it} \quad (2)$$

In the case that the quadratic term in (2) is statistically significant, the quadratic specification must be substituted for linear model (1) to analyse the effect of government cost on firm value. The reason is that if using the linear model (1), the model is suffered from misspecification due to omitting the significant quadratic term. Excluding this variable may result in endogeneity that leads to a biased and inconsistent estimation.

Additionally, Chen et al. (2011) assert that government intervention in SOEs significantly distorts investment behavior and hurts investment efficiency. Bu et al. (2017) suggest that government subsidy is negatively associated with firm performance. Hence, we slightly modify model (1) by using the interaction variable between state ownership, *SOE*, and government spending, *GovCost* in order to investigate the role of state ownership as moderator in the relationship between government spending and firm value. Specifically, we explore whether there is a difference in the impact of government spending on firm value between state-owned and non-state-owned enterprises. A positive coefficient of the interaction term suggests that the effect of government cost on corporate value in state-owned enterprises are stronger than that of non-state-owned enterprises and otherwise.

The regression function with interaction is:

$$Tobin'sQ_{it} = \beta_1 + \gamma_1 GovCost_{it} + \gamma_2 GovCost_{it}^2 + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 (SOE_{it} \times GovCost_{it}) + \beta_5 Age_{it} + \beta_6 FreeFloat_{it} + \beta_7 HOSE_{it} + \mu_i + \delta_t + \varepsilon_{it} \quad (3)$$

Beside using a multiple regression analysis, this paper also investigates in detail the nonlinear impact of government spending on firm value over the distribution of Tobin's Q by the quantile regression.

Instead of estimating the parameters of the average regression by ordinary least squares, Koenker and Bassett (1978) propose estimating the regression parameter on each quantile of dependent variable. In other words, instead of determining the marginal effect of the explanatory variables on the mean of the dependent variable, the quantile regression helps determine the marginal effect of the explanatory variables across the dependent variable's distribution. The conditional quantile regression of Y in terms of X's at quantile $\tau \in (0,1)$ is a function $Q_\tau(Y_i) = X_i\hat{\beta}_\tau$ in which the parameter $\hat{\beta}_\tau$ is selected such that the total deviation at quantile τ is minimum. This idea is performed by following formula:

$$\widehat{\beta_\tau} = argmin\left(\tau \sum_{y_i \geq X_i\beta_\tau} (y_i - X_i\beta_\tau) + (\tau - 1) \sum_{y_i < X_i\beta_\tau} (y_i - X_i\beta_\tau)\right) \quad (4)$$

In this study, we estimate Eqs. (1), (2) and (3) to analyze the effect of government spending on firm value across distribution of firm values. This will demonstrate a detailed view of the impact of government spending on business value at different levels of firm values using different effects. Although quantile regression can be performed at any quantile $\tau \in (0,1)$ of Tobin's Q, this article only shows results in some typical ones such as 0.1; 0.25; 0.5; 0.75; and 0.9.

Table 1
This table shows the descriptive statistics of government cost as a percentage of total expenditures by year. It summarizes the costs of 63 provincial governments 2010–2014. The cost of government (*GovCost*) is measured by the administrative expenditure of local government scaled by total expenditures.

Year	Mean	Median	Std dev	Minimum	Maximum
2010	5.828	4.594	2.674	4.363	27.489
2011	6.017	5.118	2.039	4.119	15.196
2012	6.464	5.653	2.116	2.787	14.054
2013	7.089	7.001	2.544	0.544	17.316
2014	8.121	8.241	2.483	4.281	17.287

4. Results and discussion of results

4.1. Descriptive statistics

The summary statistics of government cost are reported in Table 1. We observe some interesting points. For example, the average government cost increases over time, from about 5,5% of total government expenditures in 2010 to 8,1% in 2014. There is also a wide dispersion of government's costs across provinces from a minimum of 0.544% to a maximum of 27%.

Table 2 shows the summary of firm characteristics and firm performance in Vietnam's stock exchanges. The number of firms in sample is different across years. This forms an unbalanced panel data. The average of firms' size slightly increases during the time from 2010 to 2014. The ratio of total debt to total asset has a mean of 0.771 in 2010 and rises lightly over 0.8 during the years from 2011 to 2014.

4.2. Government cost and market valuation of firms

Table 3 presents the test results concerning the relationship between local government expenditures and firm value. Column (1) and column (2) of this table represent the results of linear and quadratic regression functions of the Tobin's Q variable. Column (3) and column (4) represent these two types of functions of Tobin's Q.

The results in all four columns offer strong evidence suggesting a statistically significant impact of local government spending on firm value. However, the linear model in columns 1 and 3 are not used for analysis because the omitted quadratic term of government spending may result in a biased and inconsistent coefficient of variable *GovCost*.

According to the results of the quadratic models shown in column 2 of Table 3, the coefficient of the quadratic term is positive and statistically significant. This implies that the impact of local government cost on corporate value follows a U-shaped form. That means there exists a threshold value in government cost so that if the government cost is below the threshold, the effect of government cost on firm value is negative; whereas if the government cost is above the threshold, firm value is positively related to the government cost. The threshold value obtained from the regression result is $-\frac{0.000838}{2\times(-0.00790)} = 0.05303 \sim 5.303\%$.

Using the two different measures for Tobin's Q, the regression results shown in column 4 of Table 3 is consistent with results reported in column 2. That is, the U-shaped relationship between government expenditures and corporate value is also statistically significant. More specially, the threshold value is $-\frac{0.000846}{2\times(-0.0106)} = 0.0399 \sim 3.99\%$.

The parabolic relationship of government cost and firm value is again tested across the distribution of *Tobin's Q* by quantile regression. The quantiles are chosen to regress are 0.1, 0.25, 0.5, 075, and 0.9. These are combinations of decimal and quartile, which are frequently used in the quantile regression approach. The results of quantile regression shown in Table 4 reveal more details regarding this relationship. The signs of coefficients in all quantile are consistent to the whole sample ones. However, the magnitude of coefficients varies across quantiles. This indicates that the strength of the impact of government cost on firm value is not the same among the quantiles. More clearly, the U-shaped relationship exists in almost quantiles except the highest one. The U-shaped effect of government spending on firm value is significant at lower quantiles, such as 0.1, 0.25, 0.5, and 0.75. That means, if other things equal, the lower *Tobin's Q* firms are stronglier affected by government spending than those in the top quantiles.

Apart from reporting a U-shaped impact of government spending on enterprise value, the results in Table 3 and Table 4 also

Table 2
This table shows descriptive statistics of firm characteristics by year. It summarizes firm characteristics from 2010 to 2014. *Tobin's Q* is the ratio which is calculated by comparing the market value of a company's equity and liabilities with its corresponding book values, which are calculated by two alternative ways. *Size* is measured by the total assets of the business after taking the logarithm; *Leverage* is measured by the ratio of debt to total equity; *Leverage* is winsorized at 1% and 99% levels. ROA is return on asset of firm.

Year	Obs	Size	Leverage	TobinQ1	TobinQ2	ROA
2010	350	13.070	0.771	1.277	0.836	8.660
2011	470	13.110	0.833	0.664	0.562	6.386
2012	547	13.059	0.826	0.725	0.614	4.945
2013	560	13.121	0.839	0.883	0.686	4.746
2014	558	13.205	0.805	1.075	0.763	21.388

Table 3
This table presents the regression results concerning the relationship between local government expenditures and firm value in linear and quadratic function. Firm value, represented by Tobin's Q is calculated using two alternative ways. *Size* is measured by the total assets of the business after taking the logarithm; *Leverage* is measured by the ratio of debt to total equity; *Leverage* are winsorized at 1% and 99% levels; *SOE* is a dummy variable which takes a value of 1 if the firm is state-owned and zero otherwise; *Age* is the number of years since firms start listing on the stock market; *FreeFloat* is the percentage of tradable shares to total shares at the end of the prior year; *HOSE* is a dummy variable which takes a value of 1 if firm is listed on Ho Chi Minh Stock Exchange and zero otherwise.

Variables	*TobinQ*1	*TobinQ*1	*TobinQ*2	*TobinQ*2
	(1)	(2)	(3)	(4)
GovCost	0.00714***	−0.00790*	0.00382*	−0.0106
	[5.50]	[−1.64]	[1.78]	[−1.38]
$GovCost^2$		0.000838***		0.000846**
		[3.11]		[1.99]
Size	0.0379***	0.0380***	0.110***	0.112***
	[13.23]	[13.11]	[22.92]	[22.94]
Leverage	−0.00726**	−0.00656*	−0.109***	−0.109***
	[−2.05]	[−1.87]	[−16.40]	[−16.31]
SOE	0.00954	0.0129	0.183***	0.185***
	[0.77]	[1.05]	[12.55]	[12.76]
Age	0.00331**	0.00292**	−0.0173***	−0.0184***
	[2.25]	[1.98]	[−7.92]	[−8.27]
FreeFloat	−0.000449***	−0.000412***	−0.00123***	−0.00115***
	[−3.53]	[−3.23]	[−5.86]	[−5.43]
HOSE	0.128***	0.127***	0.0748***	0.0734***
	[17.42]	[17.33]	[5.61]	[5.52]
Year dummies	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes
Constant	−0.244***	−0.195**	−1.715***	−1.714***
	[−3.11]	[−2.46]	[−14.11]	[−13.92]
Observations	2101	2101	2101	2101
Pseudo R^2	0.1399***	0.1405***	0.1955***	0.1962***
Model test	2042.68***	2047.14***	10857.36***	11401.01***
Jointly significant		34.38***		7.14**

Note *,**,*** denote statistical significance at the 10%, 5% and 1% levels respectively.

Table 4
This table shows the results of quantile regression in quadratic form. Quantile regression is performed at some typical quantiles, including 0.1, 0.25, 0.5, 0.75 and 0.9. Dependent variable different indicators of Tobin's Q. Explanatory variables include the followings: *Size* is measured by logarithm of the total assets of the business; *Leverage* is measured by the ratio of debt to total equity; *Leverage* are winsorized at 1% and 99% levels; *SOE* is a dummy variable which takes a value of 1 if the firm is state-owned and zero otherwise; *Age* is the number of years since firms start listing on the stock exchange; *FreeFloat* is the percentage of tradable shares to total shares at the end of the prior year; *HOSE* is a dummy variable which takes a value of 1 if firm is listed on the Ho Chi Minh Stock Exchange and zero otherwise. Industry and year-fixed effects are included.

Variables	Quantile				
	Q10	Q25	Q50	Q75	Q90
GovCost	−0.0158*	−0.0118	−0.0260**	−0.0272*	−0.0124
	[−1.65]	[−1.31]	[−2.48]	[−1.92]	[−0.39]
$GovCost^2$	0.00107**	0.000975**	0.00210***	0.00197***	0.000778
	[2.10]	[2.03]	[3.73]	[2.59]	[0.46]
Size	0.00333	0.0129**	0.0160**	0.0232***	0.0551***
	[0.59]	[2.41]	[2.57]	[2.75]	[2.93]
Leverage	0.0587***	0.0559***	0.0306***	−0.0248**	−0.0913***
	[7.58]	[7.70]	[3.61]	[−2.16]	[−3.56]
SOE	0.0558***	0.102***	0.0710***	0.0337	0.00228
	[2.72]	[5.30]	[3.16]	[1.10]	[0.03]
Age	0.00141	0.000858	−0.00107	−0.00271	−0.00596
	[0.50]	[0.33]	[−0.35]	[−0.65]	[−0.64]
FreeFloat	0.00012	−0.000306	−0.000278	−0.00103***	−0.000592
	[0.46]	[−1.26]	[−0.97]	[−2.66]	[−0.69]
HOSE	0.0945***	0.111***	0.123***	0.127***	0.199***
	[6.15]	[7.72]	[7.27]	[5.56]	[3.91]
Year dummies	yes	yes	yes	yes	Yes
Industry dummies	yes	yes	yes	yes	Yes
Constant	0.23	0.0986	0.245	0.411*	−0.193
	[1.45]	[0.66]	[1.41]	[1.75]	[−0.37]
Observations	2101	2101	2101	2101	2101

Note: *,**, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively

Table 5
This table shows GLS and quantile regression results of *TobinQ* on government's cost in quadratic form in which the interaction between government cost and SOE is included. GLS are employed instead of OLS because of heteroskedasticy. Quantile regression is performed at some typical quantiles as 0.1, 0.25, 0.5, 0.75 and 0.9. The dependent variable is Tobin's Q. Explanatory variables include the followings: *Size* is measured by the logarithm of the total assets of the business; *Leverage* is measured by the ratio of debt to total equity; *Leverage* are winsorized at the 1% and 99% levels; *SOE* is a dummy variable which takes a value of 1 if the firm is state-owned and zero otherwise; *Age* is the number of years since firms start listing on the stock exchange; *FreeFloat* is the percentage of tradable shares to total shares at the end of the prior year; *HOSE* is a dummy variable, which takes a value of 1 if firm is listed on the Ho Chi Minh City Stock Exchange and zero otherwise. Industry and year-fixed effects are included.

Variables	GLS	Quantile				
		Q10	Q25	Q50	Q75	Q90
GovCost	−0.00839*	−0.0127	−0.0176*	−0.0362***	−0.0291**	−0.0132
	[−1.74]	[−1.36]	[−1.91]	[−3.47]	[−2.07]	[−0.42]
$GovCost^2$	0.000869***	0.000767	0.00108**	0.00259***	0.00205***	0.000826
	[3.22]	[1.52]	[2.18]	[4.59]	[2.69]	[0.49]
Size	0.0377***	0.00186	0.0108**	0.0179***	0.0234***	0.0537***
	[12.82]	[0.34]	[1.98]	[2.87]	[2.79]	[2.88]
Leverage	−0.00693**	0.0604***	0.0555***	0.0293***	−0.0242**	−0.0908***
	[−1.99]	[8.01]	[7.44]	[3.46]	[−2.12]	[−3.59]
GovCost × SOE	0.00223	0.00728**	0.0133***	0.00893***	0.00382	0.0008
	[1.31]	[2.52]	[4.63]	[2.75]	[0.87]	[0.08]
Age	0.00279*	0.00173	0.00128	−0.000473	−0.00316	−0.0064
	[1.90]	[0.64]	[0.48]	[−0.16]	[−0.77]	[−0.71]
FreeFloat	−0.00043***	0.00017	−0.00042*	−0.00017	−0.0010***	−0.00059
	[−3.39]	[0.66]	[−1.67]	[−0.62]	[−2.70]	[−0.69]
HOSE	0.127***	0.0926***	0.113***	0.122***	0.129***	0.201***
	[17.33]	[6.18]	[7.66]	[7.24]	[5.70]	[3.99]
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes
Constant	−0.182**	0.264*	0.203	0.234	0.419*	−0.153
	[−2.29]	[1.72]	[1.34]	[1.36]	[1.80]	[−0.30]
Observations	2101	2101	2101	2101	2101	2101

Note: *,**, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

document the impact of other factors (size, financial leverage, and state-ownership) on firm value. Accordingly, we find that larger business size is associated with higher firm value. We also find that the firm size has stronger impact on firm value for firms in higher quantiles of *Tobin's Q*. However, this effect is not statistically significant for firms at left tail of *Tobin's Q*.

Table 3 also reveals overall negative impact of financial leverage on firm value. Generally, firms with higher total debt ratio have lower firm value. However, considering across distribution of *Tobin's Q*, this relation is not always true. This only works for firms in high quantiles, particularly in the 0.75 and 0.9 quantiles. Meanwhile, for firms at low quantiles of Tobin's Q, we find that leverage plays an important role in boosting corporate value.

The results also show a significant difference in *Tobin's Q* for firms listed on the Ho Chi Minh City stock exchange and those listed on the Hanoi stock exchange. The average value of *Tobin's Q* of firms listed on the Ho Chi Minh City stock exchange is higher than that of firms listed on the Hanoi stock exchange. This happens across all quantiles ranging from 0.1 to 0.9. Moreover, we find that the difference in firm valuation is higher for firms in higher quantiles of Tobin's Q.

4.3. Government cost and firm value: the moderating role of the state ownership

Many theoretical and empirical studies have mentioned about state ownership as a moderator in the relationship between government spending and corporate value. It is expected that the impact of government spending on corporate value for state-owned enterprises will be stronger than that of other firms. To confirm this statement, this article uses the interaction variable between the dummy SOE and government cost variables. The dummy SOE takes value of 1 if the business is state-owned and 0 otherwise. If the regression coefficient of the interaction term is statistically significant after controlling for other factors, it is statistical evidence to support for the moderator of SOE.

Table 5 reports the results when estimating models with interaction variable estimated by using Generalized Least Squares for both full sample and quantile regression. We observe that the sign and magnitude of the regression coefficients are similar to estimation of the equations without the interaction terms.

The coefficient of the interaction variable GovCost x SOE is positive but not significant in the mean regression equation. However, at each quantile, the interaction is statistically significant at low quantiles such as 0.25; 0.5 and 0.75 but not at higher quantiles 0.75 − 0.9. This result implies that, other things equal, high value SOEs are not significantly affected by government cost, but low value SOEs.

Table 6
This table shows GLS and quantile regression results of the model in quadratic form in order to check the robustness of the previously reported results. GLS is employed instead of OLS because of heteroskedasticity. Quantile regression is performed at some typical quantiles of 0.1, 0.25, 0.5, 0.75 and 0.9. The dependent variable is ROA, a measure of firm performance. Explanatory variables are similar to Table 3.

Variables	GLS	Quantile				
		Q10	Q25	Q50	Q75	Q90
GovCost	−0.231**	−0.315	−0.367**	−0.577**	−0.555*	−0.539
	[−2.34]	[−1.20]	[−2.48]	[−2.55]	[−1.71]	[−1.01]
GovCost^2	0.0238***	0.0172	0.0196**	0.0440***	0.0403**	0.0424
	[4.18]	[1.23]	[2.46]	[3.64]	[2.32]	[1.48]
Size	0.525***	0.490***	0.286***	0.265**	−0.112	0.411
	[11.79]	[3.14]	[3.24]	[1.97]	[−0.58]	[1.29]
Leverage	−2.784***	−1.063***	−0.954***	−1.926***	−2.697***	−3.932***
	[−47.69]	[−5.01]	[−7.95]	[−10.53]	[−10.28]	[−9.06]
SOE	0.364***	1.500***	1.957***	1.657***	1.029	1.143
	[2.88]	[2.66]	[6.13]	[3.40]	[1.47]	[0.99]
Age	−0.00758	−0.0478	0.0145	−0.0224	−0.128	−0.385**
	[−0.34]	[−0.62]	[0.33]	[−0.34]	[−1.33]	[−2.44]
FreeFloat	−0.0151***	−0.0106	−0.0148***	−0.0179***	−0.00603	−0.0093
	[−7.34]	[−1.49]	[−3.68]	[−2.90]	[−0.68]	[−0.64]
HOSE	0.872***	−0.177	0.0355	0.871**	1.826***	2.246***
	[8.14]	[−0.42]	[0.15]	[2.40]	[3.50]	[2.60]
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes
Constant	−3.688***	−9.752**	−2.659	1.62	16.35***	8.648
	[−2.90]	[−2.24]	[−1.08]	[0.43]	[3.04]	[0.97]
Observations	2090	2090	2090	2090	2090	2090

Note: *,**, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

4.4. Robustness check

In order to ensure the robustness of the results, other parabolic regressions are estimated to examine the relationship between government spending and corporate value. For example, we use other variables to measure operating performance, including ROA and ROE. Regression estimation is performed for both cases with and without the interaction between state ownership and government spending. Regression results for ROA and ROE without interaction variables are shown in Tables 6 and 7. The results with

Table 7
This table shows GLS and quantile regression results of ROE on government's cost in quadratic. GLS are employed instead of OLS because of heteroskedasticity. Quantile regression is performed at some typical quantiles as 0.1, 0.25, 0.5, 0.75 and 0.9. The dependent variable is ROE. Explanatory variables are similar to Table 3. Industry and year-fixed effects are included.

Variables	GLS	Quantile				
		Q10	Q25	Q50	Q75	Q90
GovCost	−0.877***	−1.123	−0.842**	−1.653***	−1.089**	−3.016***
	[−3.71]	[−1.56]	[−2.28]	[−3.56]	[−2.27]	[−3.74]
GovCost^2	0.0624***	0.0591	0.0403**	0.0949***	0.0718***	0.192***
	[4.49]	[1.53]	[2.04]	[3.82]	[2.80]	[4.44]
Size	1.763***	1.499***	0.984***	1.231***	1.291***	1.646***
	[14.33]	[3.49]	[4.48]	[4.45]	[4.51]	[3.42]
Leverage	−3.544***	−3.104***	−1.402***	−2.261***	−3.171***	−3.557***
	[−22.97]	[−5.32]	[−4.69]	[−6.01]	[−8.15]	[−5.44]
SOE	1.336***	4.047***	4.447***	3.704***	3.176***	6.901***
	[2.65]	[2.60]	[5.59]	[3.69]	[3.07]	[3.96]
Age	−0.0124	−0.0156	−0.0352	−0.264*	−0.586***	−0.751***
	[−0.22]	[−0.07]	[−0.32]	[−1.93]	[−4.14]	[−3.15]
FreeFloat	−0.0521***	−0.0441**	−0.0336***	−0.0427***	−0.0334**	−0.0274
	[−10.12]	[−2.25]	[−3.35]	[−3.37]	[−2.55]	[−1.24]
HOSE	−1.268***	−1.706	−0.856	−0.311	−0.159	0.495
	[−4.59]	[−1.47]	[−1.44]	[−0.42]	[−0.21]	[0.38]
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes
Constant	−21.81***	−29.52**	−14.10**	−9.777	−5.319	−0.0924
	[−6.24]	[−2.47]	[−2.30]	[−1.27]	[−0.67]	[−0.01]
Observations	2086	2086	2086	2086	2086	2086

Note: *,**, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 8
This table shows GLS and quantile regression results of *ROA* on government's cost in quadratic form in which the interaction between government cost and SOE is included. GLS are employed instead of OLS because of heteroskedasticity. Quantile regression is performed at some typical quantiles of 0.1, 0.25, 0.5, 0.75 and 0.9. The dependent variable is ROA, a measure of firm performance. Explanatory variables are similar to Table 5.

Variables	GLS	Quantile				
		Q10	Q25	Q50	Q75	Q90
GovCost	−0.226**	−0.416	−0.448***	−0.591***	−0.412	−0.53
	[−2.25]	[−1.62]	[−2.99]	[−2.60]	[−1.25]	[−0.99]
$GovCost^2$	0.0230***	0.0192	0.0219***	0.0401***	0.0318*	0.0414
	[3.88]	[1.38]	[2.70]	[3.27]	[1.78]	[1.42]
Size	0.531***	0.459***	0.292***	0.283**	−0.105	0.427
	[11.80]	[2.99]	[3.27]	[2.10]	[−0.54]	[1.33]
Leverage	−2.779***	−1.107***	−0.959***	−1.955***	−2.722***	−3.954***
	[−47.49]	[−5.30]	[−7.90]	[−10.63]	[−10.20]	[−9.08]
GovCost × SOE	0.0215	0.229***	0.265***	0.276***	0.164	0.126
	[0.66]	[2.85]	[5.65]	[3.90]	[1.59]	[0.75]
Age	−0.000918	−0.049	0.0064	−0.0193	−0.135	−0.389**
	[−0.04]	[−0.65]	[0.15]	[−0.29]	[−1.41]	[−2.49]
Freeloat	−0.014***	−0.013*	−0.013***	−0.018***	−0.00537	−0.011
	[−6.53]	[−1.91]	[−3.11]	[−3.04]	[−0.60]	[−0.75]
HOSE	0.888***	−0.213	−0.0597	0.862**	1.870***	2.286***
	[8.14]	[−0.51]	[−0.25]	[2.36]	[3.52]	[2.64]
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes
Constant	−3.708***	−8.041*	−2.241	1.488	15.63***	8.396
	[−2.95]	[−1.89]	[−0.91]	[0.40]	[2.87]	[0.95]
Observations	2090	2090	2090	2090	2090	2090

Note: *,**, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

interaction terms are shown in Tables 8 and 9.

Table 6 presents the regression with the parabolic specification of model where ROA is the dependent variable using quantile regression. The results are very consistent with the results reported in Tables 3 and 4. This finding shows a nonlinear relationship between local government spending and firm value (measured by both Tobin's Q and ROA).

In analyzing the nonlinear relation between ROA and government spending, we find that the estimated coefficient for the interaction variable *GovCost* × *SOE* is consistent with the previous results reported in Table 5. More particularly, this coefficient of

Table 9
This table shows GLS and quantile regression results of ROE on government's cost in quadratic form in which the interaction between government cost and SOE is included. GLS are employed instead of OLS because of heteroskedasticity. Quantile regression is performed at some typical quantiles as 0.1, 0.25, 0.5, 0.75 and 0.9. The dependent variable is ROE, a measure of firm performance. Explanatory variables are similar to Table 5.

Variables	GLS	Quantile				
		Q10	Q25	Q50	Q75	Q90
GovCost	−0.849***	−1.253*	−0.878**	−1.607***	−1.286***	−3.070***
	[−3.48]	[−1.75]	[−2.51]	[−3.44]	[−2.61]	[−3.87]
$GovCost^2$	0.0577***	0.0583	0.0392**	0.0823***	0.0817***	0.178***
	[3.96]	[1.50]	[2.07]	[3.25]	[3.06]	[4.14]
Size	1.748***	1.413***	0.962***	1.245***	1.311***	1.664***
	[14.16]	[3.31]	[4.62]	[4.47]	[4.46]	[3.52]
Leverage	−3.529***	−2.788***	−1.469***	−2.337***	−3.218***	−3.602***
	[−22.67]	[−4.79]	[−5.19]	[−6.17]	[−8.05]	[−5.61]
GovCost × SOE	0.157**	0.508**	0.649***	0.472***	0.501***	0.924***
	[2.03]	[2.26]	[5.93]	[3.23]	[3.25]	[3.73]
Age	−0.0138	−0.0291	−0.0672	−0.295**	−0.593***	−0.834***
	[−0.25]	[−0.14]	[−0.66]	[−2.17]	[−4.14]	[−3.61]
FreeFloat	−0.0524***	−0.0414**	−0.0328***	−0.0464***	−0.0330**	−0.031
	[−10.07]	[−2.11]	[−3.44]	[−3.64]	[−2.45]	[−1.43]
HOSE	−1.260***	−1.435	−0.718	−0.381	−0.257	−0.195
	[−4.52]	[−1.24]	[−1.28]	[−0.51]	[−0.32]	[−0.15]
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes
Constant	−21.06***	−26.06**	−12.72**	−9.013	−4.73	1.65
	[−6.07]	[−2.20]	[−2.20]	[−1.17]	[−0.58]	[0.13]
Observations	2086	2086	2086	2086	2086	2086

Note: *,**, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

interaction term is positive and statistically insignificant. Meanwhile, this interaction term is statistically significant at the lower quantiles, including 0.1, 0.25, and 0.5 but not statistically significant at 0.75 and 0.9 quantiles.

As an extra robustness test, we use another measure of operating performance which is return on equity (ROE). This indicator is also regressed with the parabolic function of government spending. This extra estimation yields consistent results as in Table 3, 4 and 5. This reconfirms the statistical evidence of nonlinear relationship between local government spending and firm value.

5. Conclusion

It is commonly agreed that aligning the interests of local governments and corporate objectives is an important issue for developing and transition economies (Jin et al., 2005). This paper investigates the link between government cost and firm value. Government policy is important in the sense that it serves as measures to stimulate businesses and corporate activities in a region or country (Terjesen et al., 2016). Keupp and Gassmann (2009) suggest that the government-firm is important basis for analyzing corporate innovation.

All of the regression results in the paper show a consistent conclusion of a nonlinear U-shaped relationship between local government cost and firm value. The empirical evidence shows that there is a threshold value of government cost so that if the proportion of government administrative spending in total expenditures is lower than the threshold value, other factors remain unchanged, the government spending negatively influences corporate value. If the ratio of government spending is higher than the threshold value, government spending plays an important role in boosting corporate value. Thus, the impact of government spending on corporate value is not constant. The government's role to promote or refrain depends on the actual level of government spending. According to the regression results, the threshold value of government spending is about 5%.

The nonlinear relationship between government expenditures and corporate value across the distribution of Tobin's Q is investigated using quantile regression. The U-shaped relationship is clearly evidenced in lower quantiles of firm value. However, this nonlinear relationship is not statistically significant at high quantile such as the group of firms who are at the top 10% of Tobin's Q.

This article also examines the moderating role of state ownership in the relationship between government spending and corporate value. In general, we find that there is no difference in the impact of government spending on enterprise value between the state-owned and non-state-owned firms. However, this paper documents that the moderator role of state ownership is strong at low quantiles. In contrast, for the group of top 10% in Tobin's Q, there is no significant difference in the impact of government spending on corporate value between the state-owned and non-state owned firms.

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