The moderation role of investment opportunities in modifying the impact of state ownership on corporate risk-taking behavior

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Abstract

This research aims at examining the moderation role of investment opportunities in the effect of state ownership on risk-taking behavior. The financial data of non-financial listed firms in Hanoi and Ho Chi Minh stock exchanges are collected from Bloomberg. The sample includes firm observations during the period from 2015 to 2020 with 2,664 firm-year observations. The paper finds that state ownership negatively affects corporate risk-taking behavior. Investment opportunities are found to moderate the negative impact of state ownership on corporate risk-taking activities. The findings are robust by year-fixed effects along with clustered standard errors. Based on these findings, two policy recommendations are provided. First, state-owned firms should improve their corporate governance to deal with agency problems. Second, the government should consider policies to encourage state-owned firms to increase their risk-taking behavior.

Keywords: Investment opportunities, State ownership, Risk-taking

1. Introduction

Corporate risk-taking is important for the development of firms (Vo, 2018). Previous studies highlight that risk-taking behavior is affected by state ownership (Nguyen *et al.*, 2020; Uddin, 2016; Vo, 2018), foreign investors (Vo, 2016), corporate culture (Hilary and Hui, 2009), multiple large shareholders (Boubaker *et al.*, 2016), corporate governance (Dong *et al.*, 2017; Faccio *et al.*, 2016; Nguyen, 2011), ultimate ownership (Su *et al.*, 2017), and firm performance (Ha *et al.*, 2019; Phung and Mishra, 2016). The association between state ownership and risk

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activities is found to have a non-linear U-shape (Nguyen *et al.*, 2020; Uddin, 2016). However, little is known about the relationship between investment opportunities, state ownership, and corporate risk-taking activities in Vietnam.

The conflict of interests between the corporate managers and shareholders arises because of differences in their benefits (Jensen and Meckling, 1976). The agency theory describes the behavior of state owners as inside owners. Companies truly benefit from the political connection with the government, which supports them in doing risky investments as the government approves and protects risky investments (Uddin, 2016). The other literature confirms the relationship between corporate investment decisions and the agency problem due to the information asymmetry between managers and shareholders (Fazzari *et al.*, 1988; Jensen, 1986; Myers and Majluf, 1984). Fama and Jensen (1983) find that the agency problem is controlled by important decisions of managers. The literature only highlights the relationship between state ownership and corporate risk-taking behavior (Nguyen *et al.*, 2020; Vo, 2016). However, the moderation role of investment opportunities on the relationship between state ownership and risk-taking behavior has not been examined yet. Therefore, an important question is that whether investment opportunities moderate the relationship between state ownership and risk-taking behavior arises.

We choose firms in Vietnam due to the following reasons. Firstly, Vietnam has a transition economy, which is characterized by the ascendency of state-owned enterprises in the past (Vo, 2016). Secondly, Vietnam has an emerging market with potential information asymmetry. Finally, how investment opportunities moderate the relationship between state ownership and corporate risk-taking behavior is unknown in the country.

In this study, we examine the moderation role of investment opportunities in modifying the impact of state ownership on corporate risk-taking behavior. To conduct the study, we use data of 444 firms, which account for over 60% of the stock market capitalization during the period from 2015 to 2020. Our empirical findings are two folds. First, a higher level of state ownership is negatively associated with corporate risk-taking behavior. Second, state-owned firms with more investment opportunities present a greater tendency towards risk-taking activities. Our findings are robust with different estimations using year-fixed effects along with clustered standard errors.

Our study contributes to the literature in several ways. Firstly, we find that investment opportunities moderate the relationship between state ownership and risk-taking behavior. While previous studies have focused on investigating how state ownership influences corporate risk-taking behavior (Nguyen *et al.*, 2020; Vo, 2018), this study is the first to test the association between state ownership and corporate risk-taking behavior when there is a moderating variable of investment opportunities. This finding highlights the risk management function of firms with state ownership to improve corporate governance. Secondly, the interaction between state ownership and investment opportunities plays a significant role in explaining the risk behavior. Therefore, our findings support the agency theory.

The remainder of this study includes five sections. Section 2 introduces the literature review and hypothesis development. Section 3 presents the data description and empirical design. Section 4 shows the empirical findings. Section 5 presents the conclusion.

2. Literature review and hypothesis development

The agency theory indicates that there exists a conflict of interests between shareholders and managers (Jensen and Meckling, 1976). Some stated-owned firms may have a certain level of private ownership but the legal representatives are state-owned managers (Uddin, 2015). Thus, a conflict of interest exists between the agents and the private shareholders. The agents have the political power to intrude in firms' decisions to follow government objectives. Governments have their own economic, political, and social goals. They have incentives to hold state ownership in firms to control important strategies (Uddin, 2015). On the contrary, the motivation of the private shareholders is not only firm performance but also growth opportunities (Uddin, 2016). Hoskisson *et al.* (2017) suggest that ownership structure can influence corporate risk-taking behavior. Firms with a lower level of risk-taking activities may face severe agency problems because they benefit managers (Su *et al.*, 2017).

Previous empirical studies have confirmed the negative relation between state ownership and risk-taking behavior. Employing a dataset of 26,513 enterprises from 77 countries during the period of 1988-2008, Boubakri *et al.* (2013) investigate the effect of political institutions on risk-taking activities and find that government ownership has a negative impact on risk-taking activities. Similarly, political associations are associated with better performance and a lower level of risk-taking behavior for firms in Russia over the period of 2006-2014 (Abramov *et al.*, 2017). Moreover, greater state ownership leads to a significant reduction in risk-taking activities with evidence from a dataset of non-financial listed firms on the Ho Chi Minh Stock Exchange during the period of 2007-2015 in Vietnam (Vo, 2018). In addition, Vo (2018) suggests that enterprises with a higher level of state ownership have a lower incentive to take more risk on investment. Similarly, Zhou *et al.* (2017) argue that state-owned firms tend to fall behind of innovative activities even though they have plentiful funding for research and development (R&D). Following these studies, the first hypothesis is developed as follows:

H1: State ownership negatively affects corporate risk-taking behavior.

The agency theory emphasizes that conflicts between managers and shareholders may lead to the avoid of risk-taking behavior (Jensen and Meckling, 1976). This state may occur when firms have already reached profitability and managers have chosen to get a stable return without taking higher-risk decisions. The risk-taking behavior of managers is related to the benefit of managers, implying the agency problem. In reality, firms with state ownership can exacerbate the problem because the government has no motivation to make profitable investments with greater risks (Zhou *et al.*, 2017). John *et al.* (2008) argue that firms' growth is driven by managerial risk choices in corporate investment decisions. However, government policies are pursued to maximize social constancy and employment in order to undertake risky investments (Boubakri *et al.*, 2013). In particular, these policies aim to

maximize employment and wages, which are not necessarily in line with profit maximization. In addition, governments appoint bureaucrats in state-owned firms who are good at dealing with politicians but not necessarily good at taking the development opportunities of firms (Boubakri *et al.*, 2013). Due to the political burdens, investment behavior of state-owned firms may be altered inefficiently, implying that the state-ownership will be associated with lower investment activities (Fan *et al.*, 2007).

In addition, the literature shows that risk-taking plays an important role in corporate investment (Cheng *et al.*, 2020). Managers tend to suspend investment when uncertainties arise, leading to miss profitable projects (Ming *et al.*, 2016). A lower level of corporate risk-taking reduces enterprises' development (Faccio *et al.*, 2011; Wen *et al.*, 2021). Panousi and Papanikolaou (2012) find that investment activities and corporate idiosyncratic risks have a negative relationship. However, Duho (2021) argues that investment activities drive the risk-taking behavior of firms. Lai and Liu (2018) confirm that the risk-taking preference of top management relies on the investment efficiency of firms. Moreover, Fonseka *et al.* (2021) find that state-owned firms exhibit higher under and over-investment problems relative to non-state-owned ones. Besides, Nguyen *et al.* (2020) find a U-shaped relationship between investment and state ownership because firms with government ownership reduce investment but the investment increases when the government ownership exceeds a certain threshold. This finding suggests that the state ownership, which to some extent curbs risk-taking activities and investment, may lead to more severe agency problems (Nguyen *et al.*, 2020). Uddin (2016) also finds that the state ownership in firms affects their risk-taking decisions on investment strategy. Moreover, Zhai *et al.* (2017) assert a positive link between the state ownership and risk-taking activities and investment. In contrast, Zhou *et al.* (2017) confirm that the state ownership is negatively associated with corporate risk-taking behavior and investment. In the context of Vietnam, where the equitization of the state-owned enterprises has been widely carried out, private and state-owned firms may attract new investment opportunities. When a firm has plenty of investment opportunities, managers and boards are inclined to have higher risk-taking behavior because many projects can be profitable, leading to an increase in risk-taking behavior (Nakano and Nguyen, 2012). On the contrary, if a firm has few investment opportunities, its managers will be more careful in making their decisions. Thus, the study argues that examination of the relationship between risk-taking and investment opportunities is essential to improve corporate governance. In sum, the second hypothesis for the moderation effect is proposed as follows:

H2: Investment opportunities moderate the negative impact of state ownership on corporate risk-taking behavior.

3. Data and empirical design

3.1 Sample selection

We use financial data from a sample of non-financial and listed firms in the Hanoi and Ho Chi Minh stock exchanges. The sample includes firm observations during the period from 2015

to 2020. We choose non-financial firms because of three reasons. First, the risk for financial firms is much different from the risk for non-financial firms. For example, non-performing loans are important for banks but not for manufacturing ones. Second, state ownership for banks, insurers, and securities firms is regulated by different laws, not only by Securities Law for non-financial firms. Last but not least, the accounting format of financial firms, such as banks, insurance, or securities, is much different from that of non-financial firms. Therefore, investment opportunities are also different from those of non-financial firms. These selection criteria yield a sample of 2,664 firm-year observations. The data are collected from Bloomberg.

3.2 Variable construction

We employ two risk-taking indicators as dependent variables that are respectively calculated as follows:

$$BRT_{it} = \frac{ROA_{it}}{\sigma_{ROAi}} \quad \text{and} \quad ORT_{it} = \frac{ROE_{it}}{\sigma_{ROEi}}$$

where ROA_{it} and ROE_{it} are the returns on assets and the returns on equity of firm i at year t, respectively. σ_{ROAi} and σ_{ROEi} denote the standard deviation of ROA and ROE. BRT is business risk-taking behavior and ORT denotess overall risk-taking behavior for both business risks and financial risks. The two risk indicators are reverse measures. The lower value of BRT and ORT recommends a higher value of risk-taking.

The independent variables in the model include: Gov_{it} represents state ownership, which is the proportion of state holdings in firm i at the end of year t. $Gov_{it}*IO_{it}$ is the interaction term between investment opportunities and state ownership. IO_{it} is a dummy variable representing investment opportunities, which is equal to 1 if Tobin'Q is greater than 1, and 0 otherwise (Lopez-Gutierrez *et al.*, 2015). IO_{it} is a good indicator of investment opportunities because it returns the market valuation of the capacity of a firm to generate value along with its firm structure (Lopez-Gutierrez *et al.*, 2015).

Following Vo (2018) and Nguyen *et al.* (2020), this study controls variations in firm characteristics by including the log of total assets ($Size_{it}$), leverage (Lev_{it}), the ratio of cash holding in total assets ($Cash_{it}$), the ratio of fixed assets in total assets ($Fixed_{it}$), and revenue growth ($Growth_{it}$). We define our variables in the following table.

Table 1. Variable definitions

Variables	Definition
BRT	The ratio of ROA to the standard deviation of ROA, represents business risk-taking behavior.
ORT	The ratio of ROE to the standard deviation of ROE, represents overall risk-taking behavior.
Q	The ratio of the book value of total assets minus the book value of equity plus the market value of assets
IO	Taking the value of one if Q is greater than 1 and 0 otherwise

Table 1. Variable definitions (*continued*)

Variables	Definition
Gov	The proportion of state holdings at the end of the year
Cash	The ratio of cash holding to total assets at the end of the year
Size	The logarithm of the total assets at the end of the year
Lev	The ratio of total liabilities to total assets at the end of the year
Fixed	The ratio of fixed assets to total assets at the end of the year
Growth	Growth rate of revenue, i.e. (current revenue – previous revenue)/previous revenue
Industry	Used to control industry fixed effect
Year	Used to control the fixed effect of year

Source: The authors' compilation

3.3 Empirical design

Following Vo (2018) and Nguyen *et al.* (2020), we use the following model for our estimation:

$$\text{Risk-Taking}_{it} = \alpha_0 + \beta_1 \text{Gov}_{it} + \beta_2 \text{IO}_{it} + \beta_3 \text{Gov}_{it}*\text{IO}_{it} + \lambda \text{Control}_{it} + \mu_{it}$$

where i symbols the firm; t symbols the year; α denotes the intercept; β denotes the regression coefficients of the independent variables; λ is the regression coefficient of the control variables; μ is the standard error. *Risk-Taking* is the dependent variable.

In this study, we use the fixed-effects estimation method to analyze how the state ownership influences corporate risk-taking behavior. We use a robust standard error estimation, which is a technique for obtaining unbiased standard errors of coefficients under heteroscedasticity (Bramati and Croux, 2007).

4. Empirical evidence

4.1 Descriptive statistics

We collect the annual data of non-financial listed firms in Vietnam during the period of 2015-2020 from Bloomberg. Table 2 displays summary statistics of our variables. The means of BRT and ORT are 2.937 and 3.099, respectively. These values are higher than those in Vo (2018), whose BRT is 2.182 and ORT is 2.224. The comparison shows that non-financial listed firms take more business risks and financial risks over time. The descriptive statistics of firm charateristics show that the mean of state ownership is 25.2%. The average level of cash holdings is 9.8% of total assets. The average proportion of total liabilities to total assets is 48%. The average ratio of tangible fixed assets to the total asset is 21.1%. The average rate of the revenue growth is 31.8% per annum.

Table 2. Summary statistics

Variables	Observations	Mean	Median	Minimum	Maximum
BRT	2,658	2.937	3.426	-2.427	31.207
ORT	2,658	3.099	3.426	-2.456	21.892

Table 2. Summary statistics (*continued*)

Variables	Observations	Mean	Median	Minimum	Maximum
Gov	2,658	0.252	0.253	0	0.967
Cash	2,658	0.098	0.103	0.000	0.773
Size	2,658	13.376	1.54	9.631	18.574
Leverage	2,658	0.48	0.225	0.004	0.993
Fixed	2,658	0.211	0.199	0	0.933
Growth	2,658	0.318	5.585	-1.042	244.456

Source: The authors' calculation

4.2 Correlation coefficients matrix

Table 3 represents the correlation coefficient matrix of our variables in the model. It is observed that the coefficients of the interaction between the investment opportunities and state ownership and BRT as well as ORT (the two risk-taking behavior variables) are positive, reflecting that the state-owned firms with greater investment opportunities have fewer corporate risk-taking activities. Furthermore, cash holdings and fixed assets have a positive connection with the two risks while the leverage and firm size reveal a negative relationship.

In addition, the values of VIF coefficients of each pair of explanatory variables are smaller than 3, which is shown in Table 3. According to the guidelines of Hair *et al.* (1995), we confirm that multicollinearity is not a serious issue in regresion models.

Table 3. Correlation matrix

	BRT	ORT	IO	IO*Gov	Gov	Cash	Size	Lev	Fixed
BRT	1.000								
ORT	0.884***	1.0000							
IO	0.199***	0.214***	1.000						
IO*Gov	0.222***	0.212***	0.656***	1.000					
Gov	0.163***	0.159***	0.053***	0.477***	1.000				
Cash	0.260***	0.228***	0.152***	0.146***	0.076***	1.000			
Size	-0.050***	-0.033*	0.066***	0.028	-0.029	-0.165***	1.000		
Lev	-0.188***	-0.143***	-0.151***	-0.125***	0.093***	-0.297***	0.320***	1.000	
Fixed	0.040**	0.046**	0.128***	0.173***	0.167***	-0.138***	0.122***	-0.044**	1.000
Growth	-0.023	-0.019	0.014	-0.019	-0.020	-0.020	-0.040**	0.004	-0.038**
VIF	2.12	2.73	1.62	1.17	1.17	1.29	1.01		

Notes: *, **, and *** denote significance levels of 10%, 5%, and 1%, respectively.

Source: The authors' calculation

4.3 Regression results

Table 4 displays our regression results. Variable Gov has positive coefficients that are significant at the 10% level, indicating that the state-owned firms reduce risk-taking behavior and thus supporting Hypothesis 1. The negative connection between the degree of state ownership and the level of risk-taking activities is in line with recent studies of Vo (2018) and Nguyen *et al.* (2020), which argue that the state ownership reduces the degree of risk-taking behavior. Our finding shows that the state ownership negatively affects the degree of risk-taking behavior if firms have no investment opportunities. Our findings are partially consistent with the agency theory (Jensen and Meckling, 1976) that government has no motivation to make profitable investments due to taking less risky behavior.

The negative coefficient of IO*Gov is significant at the 5% level across Columns (2) and (3) in Table 4, indicating that the state-owned firms with greater investment opportunities show a significant increase in business risk taking behavior. The marginal effect of the state ownership is determined by investment opportunities. The negative interaction between the state ownership and investment opportunities suggests that investment opportunities can reduce the negative effect of the state ownership. This result indicates that the business risk-taking behavior of the state-owned firms is conditional on their investment opportunities. Thus, we argue that the state-owned firms with more investment opportunities are significantly associated with greater business risk-taking behavior.

Table 4. Results of panel data analysis

Variables	BRT			ORT		
	(1)	(2)	(3)	(4)	(5)	(6)
Gov	0.682**	1.061***	0.684**	0.7893***	0.991***	0.618*
	(2.22)	(3.26)	(2.20)	(2.65)	(2.95)	(1.85)
IO		-0.2438**	-0.219*		-0.343***	-0.333***
		(-1.98)	(-1.81)		(-3.00)	(-2.70)
IO*Gov		-0.8183**	-0.777**		-0.478	-0.558
		(-2.19)	(-2.24)		(-1.40)	(-1.61)
Cash			1.856***			1.9982***
			(3.82)			(4.27)
Size			-0.409***			-0.434***
			(-3.74)			(-3.16)
Lev			-1.8499***			1.109***
			(-4.72)			(2.55)
Fixed			-0.521			-0.365
			(-1.21)			(-0.81)
Growth			0.003			0.003
			(0.65)			(0.64)

Table 4. Results of panel data analysis (*continued*)

Variables	BRT			ORT		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	2.765***	2.8361***	9.214***	2.8938***	3.0087***	8.279***
	(35.62)	(32.18)	(6.48)	(38.60)	(33.78)	(4.84)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	2,658	2,658	2,658	2,658	2,658	2,658
Number of groups	443	443	443	443	443	443
F-statistics	4.91	9.49	13.97	8.02	11.29	9.75
Hausman test			92.71***			115.19***
			[0.00]			[0.00]
Modified Wald test			1,047.3***			241,01***
			[0.00]			[0.00]
Wooldridge test			149.51***			161,982***
			[0.00]			[0.00]

Notes: We include industry- and year-fixed effects in all specifications. *, **, and *** denote significance levels of 10%, 5%, and 1%, respectively; t-statistics are shown in parentheses; p-value in square brackets.

Sources: The authors' calculation

However, the coefficients of the variable IO*Gov are statistically non-significant at the 10% level in Columns (5) and (6), implying that greater investment opportunities of the state-owned firms do not affect overall risk-taking. First, we argue that firms tend to take more business risks than financial risks due to the increase in economic integration in Vietnam. This is because the deepening of economic integration leads to more business opportunities and more competitions. Second, the state-owned firms are supported by the government with easy credit policies and resource benefits (Zhou *et al.*, 2017). Meanwhile, the private enterprises need to take some risks to gain a competitive advantage (Vo, 2018). In addition, the government policies aim to maximize employment and wages and are not necessarily in line with profit maximization. The investment of the state-owned firms may be inefficient due to their political burden (Fan *et al.*, 2007). Therefore, we argue that greater investment opportunities from the state ownership do not affect overall risk-taking behavior. They only influence business risks.

As the variable IO's coefficients are all negative and statistically significant at the 10% level, investment opportunities are positively correlated with both business and overall risk-taking tolerance. Our finding is consistent with the viewpoint of Panousi and Papanikolaou (2012), who argues that investment activities reduce corporate idiosyncratic risk activities. As variable LEV receives opposite signs of coefficients, the impact of LEV on risk-taking behavior is not stable.

Results in Table 4 present a negative relationship between firm size and risk measures, highlighting that larger firms tend to pursue greater risk-taking activities. This finding is consistent with the assertion of Nguyen *et al.* (2020). On the contrary, the coefficients of cash holdings are positive and significant at the 1% level, indicating that firms with more cash tend to have less risk-taking activities. These findings are similar to the study of Vo (2018) that cash holdings have a positive impact on the risk-taking behavior of firms. Cash holdings help firms cope with uncertain environments, seize investment opportunities and increase efficiency firms.

The coefficients of variable Fixed are statistically non-significant at the 10% level, which is shown in Table 4. The non-significance of variable Fixed is similar to the finding of Vo (2018). Similarly, the coefficients of variable Growth are not significant. These results are opposite to the findings of Nguyen *et al.* (2020). The reason for these differences may come from the period of the database. In particular, Nguyen *et al.* (2020) use the database during the period of 2007-2015 whereas we employ the dataset for the period of 2015-2020.

4.4 Robustness tests

To check for the robustness of the findings, we perform additional analyses. We divide firms into two groups relying on the value of Tobin's Q. One group with the q ratio which is smaller than 1 has the cost to replace these firms' assets exceeding their market capitalization. The other group with the q ratio which is greater than 1 has the cost to replace their assets smaller than their market capitalization.

Table 5 reports how the influence of the state ownership varies with the values of Tobin' Q. The coefficient of Gov is negative and significant at the 10% level for firms with the Q value of more than 1 in Column (2). If the state-owned firms have plenty of investment opportunities, they have higher business risk-taking behavior in order to invest in new projects. In addition, the firms having state ownership with the Q value of less than 1 are associated with a lower level of risk-taking activities in Columns (1) and (3). These results are similar to our findings in Table 4.

Table 5. Robustness test

Variables	BRT		ORT	
	Q < 1	Q > 1	Q < 1	Q > 1
	(1)	(2)	(3)	(4)
Gov	1.074***	-0.637*	0.927**	-0.453
	(3.00)	(-1.66)	(2.22)	(-1.09)
Cash	2.520***	1.457*	2.301***	1.86**
	(3.96)	(1.86)	(3.66)	(2.41)
Size	-0.788***	-0.414***	-0.82***	-0.385**
	(-6.18)	(-3.06)	(-5.90)	(-2.13)

Table 5. Robustness test *(continued)*

Variables	BRT		ORT	
	Q < 1	Q > 1	Q < 1	Q > 1
	(1)	(2)	(3)	(4)
Lev	0.145	-3.288***	2.625***	0.413
	(0.28)	(-6.16)	(4.90)	(0.68)
Fixed	-0.441	-0.588	-0.348	-0.475
	(-0.88)	(-0.76)	(-0.66)	(-0.58)
Growth	0.0162	0.003	0.019	0.001
	(1.21)	(0.78)	(1.53)	(0.47)
Constant	12.4319***	11.022***	11.775***	9.122***
	(7.78)	(5.77)	(6.72)	(3.73)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Number of obs.	1,704	954	1,704	954
Number of groups	328	240	328	240
F-statistics	14.80	9.90	12.79	2.40

Notes: We include industry- and year-fixed effects in all specifications. *, **, and *** denote significance levels of 10%, 5%, and 1%, respectively; t-statistics are shown in parentheses.

Sources: The authors' calculation

5. Conclusion

This research explores the moderation role of investment opportunities in modifying the impact of the state ownership on risk-taking activities using the data of non-financial listed firms in Hanoi and Ho Chi Minh Stock Exchanges during the period from 2015 to 2020. We find that the state ownership is negatively associated with risk-taking behavior. Futher, it is shown that risk-taking varies among state-owned firms, depending on their available investment opportunities. Specifically, the state-owned firms with greater investment opportunities prefer a higher level of business risk-taking activities to foster their growth. The managers of state-owned firms with fewer investment opportunities have a greater propensity to a lower degree of business risk-taking behavior.

Based on the findings, the study suggests two policy implications. First, the state-owned firms should improve their corporate governance to deal with agency problems. Second, the government should consider policies to encourage the state-owned firms to increase their risk-taking for better and long-term growth.

The results contribute to the literature by pointing out the moderation role of investment opportunities in the relationship between the state ownership and risk-taking behavior. The findings offer useful information in making management decisions for shareholders and managers.

A limitation of this study is that a small sample size is used. Therefore, we propose that future studies should use a larger sample size during a longer period of time to improve the precision and efficiency of the statistical estimates.

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