VNU Journal of Economics and Business

Journal homepage: https://jeb.ueb.edu.vn

Original Article

# The non-linear impact of state ownership on corporate risk-taking in Vietnamese listed firms

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Received: September 18, 2024
Revised: 13 April, 2025; Accepted: August 25, 2025

**Abstract:** This study aims to explore the non-linear impact of state ownership on corporate risk-taking in Vietnamese listed firms. Corporate risk-taking is determined by the volatility of stock returns, which includes total risk and idiosyncratic risk. The research data is collected from annual audited financial reports of 577 non-financial listed firms on the Ho Chi Minh Stock Exchange and Hanoi Stock Exchange from 2007 to 2017. The regression outcomes, estimated by the dynamic system GMM estimator, significantly and consistently indicate that the impact of state ownership on corporate risk-taking is a U-shaped non-linearity. State ownership reduces corporate risk-taking behavior; but beyond a certain level of share held by the government, additional levels of state ownership lead to excessive hazardous activities. This article has contributed to the literature by adding empirical evidence on the non-linear impact of state ownership on corporate risk-taking in a typical emerging market. Some recommendations should be considered by state-owned firms, such as increasing the percentage of state ownership for firms operating in high-risk fields that aim for socio-economic development, whereas reducing state ownership for others to achieve profitability goals.

*Keywords:* Non-linear, risk-taking, state ownership, Vietnam.

## 1. Introduction

Corporate ownership structure has always been a crucial concern of enterprises all over the world. Different groups of owners will have inconsistent benefits and purposes that have certain influences on the firm's decision-making process, especially affecting risk-taking behavior. One of the remarkable features of Vietnam's joint stock companies is the state ownership which accounts for an extremely wide range of variation (from approximately 1 per cent to under 100 per cent). While the impact of state ownership on corporate risk-taking has been mentioned in numerous previous studies, it should be concerned about the non-linear relationship between these two factors.

The impact of state ownership on risk-taking is still ambiguous. While both political and managerial views of state-owned firms imply that state ownership is negatively related to corporate risk-taking, agency cost theory and moral hazard theory suggest that this relationship should be positive. Such studies as Boubakri et al. (2013), Khaw et al. (2016) provide empirical evidence to support the first notion, whereas studies of Iannotta et al. (2007), Zhu and Yang (2016) and Lassoued et al. (2016) expressed the second notion. However, the theory of principal-principal conflict should be

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https://doi.org/10.57110/vnu-jeb.v5i4.339

considered to explain the non-linearity correlation between state ownership and risk-taking behavior (Dharwadkar et al., 2000; Young et al., 2008; Chang, 2003; Claessens et al., 2002; Thomsen & Pedersen, 2000). When acting as a minority shareholder, the government puts political pressure on the major ones to achieve government goals, but the firms tend to behave cautiously to ensure their stability and valuation. However, the state-owned companies take excessive risk-taking when the government becomes a majority shareholder with interest venture investments that are essential for the country. The study taken by Uddin (2015) sheds light on the non-linear U-shaped impact between these two interest elements in UAE listed firms.

In Vietnam, the government is going to hold a high (even controlling) ownership level in firms related to policy-oriented and socially beneficial industries. The specific characteristic of these sectors is high risk associated with low profit, which does not attract private companies. Moreover, thanks to the effortless access to bank loans, large state-owned firms are related to a greater leverage ratio which corresponds to substantial risk. Studies taken in Vietnam such as Phung and Mishra (2016), Vo et al. (2020) found evidence that state ownership has a non-linear U-shaped effect on firm performance. However, there are no studies that have been performed yet concerning the non-linear connection between state holding and risk-taking. Taken together, these above arguments suggest that there may exist a non-linear U-shaped relationship between state ownership and corporate risk-taking in Vietnam. This article may be considered a pioneer study on the non-linear impact of state ownership on risk-taking in Vietnam listed firms.

To illustrate this interesting topic, this article employs a dataset of 577 listed firms on the Hochiminh Stock Exchange (HoSE) and Hanoi Stock Exchange (HNX) in the period from 2007 to 2017. Different from earlier studies, which utilize the volatility of return on assets (ROA), I use two proxies, namely total risk and idiosyncratic risk, to determine risk-taking. By using the volatility of stock returns (total risk and idiosyncratic risk) instead of the volatility of accounting performance (ROA) to estimate risk-taking, the result has prevented the effect from earning management behavior. State ownership is the percentage of shares held by the state in a firm. The quadratic variable of state ownership was included in a research model to investigate the non-linear relationship between state ownership and risk-taking. The two dummy variables including control and non-control of state ownership were employed to robustly check the regression results on this relationship. Consistent with earlier studies, control variables such as firm size, leverage, cashflow, capex, Tobin' Q and ROA were included in the model to eliminate the effect of these factors on the relationship between state ownership and risk-taking. Following Wintoki et al. (2012), I employ the dynamic two-step system generalized method of moments estimator (2-step SGMM) for controlling all three types of endogeneity, i.e., simultaneity, unobservable heterogeneity and dynamic endogeneity, to eliminate potential defects of the research model. The estimation results strongly posit that the impact of state ownership on risk-taking at Vietnamese listed firms is a non-linear U-shaped pattern.

To some extent, this paper contributes to the existing literature by exhibiting the non-linear impact of state ownership on corporate risk-taking; in particular, it may be considered a pioneering study in the context of Vietnam.

## 2. Literature and hypothesis

The political view of state-owned firms suggests that state-owned firms are inefficient because this serves politicians' interests, who aim to promote employment and regional development as well as ultimately to ensure success in future elections and hence long tenure in power (Boycko et al., 1996). Thus, state-owned firms are inclined to be less favorable on hazardous investments to maintain stable employment and social welfare (Fogel et al., 2008). Similarly, the managerial view of state-owned firms takes as a hypothesis that these firms, especially controlling state-owned ones, are inefficient because their managers are not adequately monitored, leading to poor incentive structures. This is because no individual owner has enough motivation to engage in monitoring actively (Vickers & Yarrow, 1991). In this case, the manager who devotes more resources to personal career concerns will prevent the company from participating in risky projects to maximize profits or market values (John et al., 2008). In general, both political and managerial views of state-owned firms imply that state ownership is negatively related to corporate risk-taking. Studies motivated by Boubakri et al. (2013) and Khaw et al. (2016) provided empirical evidence to support this notion.

By contrast, agency cost theory and moral hazard theory suggest that the impact of state ownership on corporate risk-taking should be a positive correlation. Managers of state-owned companies do not own the firm's assets. They either exert less management effort or do not fully bear the consequences of the risks they are exposed to. Poor management incentives and irresponsible risk-taking behavior lead to excessive risk and impoverished performance. Empirical evidence on the positive relationship between state ownership and corporate risk-taking is posited in studies by Iannotta et al. (2007), Zhu and Yang (2016), and Lassoued et al. (2016) at the banking sector. It is reported that

higher state ownership percentages are related to higher risk-taking in Chinese commercial banks (Zhu & Yang, 2016). These banks were designated by the state to serve vulnerable groups or venture business areas, such as lending to farmers or agricultural industry, while private ones have no interest in that field.

Regarding the non-linearity correlation between state ownership and risk-taking behavior, the theory of principal-principal conflict should be considered to explain this relationship (Dharwadkar et al., 2000; Young et al., 2008; Chang, 2003; Claessens et al., 2002; Thomsen & Pedersen, 2000). When acting as a minority shareholder, the government tends to exert political pressure on the majority to achieve government goals. However, the firm tends to behave cautiously to ensure its stability and valuation, thus is not interested in undertaking hazardous activities due to being afraid of earnings uncertainty. By contrast, firms might take excessive risk-taking when the government becomes a majority shareholder. It is claimed that the most important political motivation of government is to preserve social stability and deal with the unemployment issue. In this case, state-owned companies tend to undertake risky portfolios which are essential for the country. Based on this theory, Uddin (2015) points out the non-linear U-shaped impact between these two interest elements in UAE listed firms. In Vietnam, Phung and Mishra (2016), Vo et al. (2020) founded evidence that state ownership has a non-linear U-shaped effect on firm performance. However, there are no studies that have been performed yet concerning the non-linear connection between state ownership and risk-taking.

In conclusion, several empirical studies strongly showed that state ownership has an inverse correlation with corporate risk-taking, while this relationship should be positive in firms whose majority shareholder is the government. Hence, to examine whether the impact of state ownership on corporate risk-taking is non-linear or not, the following hypothesis is as follows:

*The impact of state ownership on corporate risk-taking at Vietnamese listed firms is a non-linear U-shaped pattern.*

## 3. Methodology

### *3.1. Variable measurement*

#### *3.1.1. Dependent variables*

Firstly, corporate risk-taking is determined by total risk *(Stdret)*. I measure the standard deviation of weekly stock returns in each year similar to Cheng (2008); Koerniadi et al. (2014) and Jiraporn and Lee (2017).

Secondly, following Jiraporn and Lee (2017) and Aabo et al. (2017), corporate risk-taking is measured by idiosyncratic risk *(Ivol)* which is calculated by the standard deviation of the residuals from the market model (Adam et al., 2005) here:

$$r_{i,t} = \alpha_i + \beta_i r_{M,t} + \varepsilon_{i,t} \qquad (*)$$

where, $r_{i,t}$ is the weekly returns of stock *i* at week *t* in each year; $r_{M,t}$ is the market portfolio return at week *t* in each year and $\varepsilon_{i,t}$ are the residuals.

#### *3.1.2. Independent variables*

Following previous studies (Boubakri et al., 2013; Khaw et al., 2016), the state ownership variable *(State)* is measured by the percentage of state ownership in firms. $State^2$ is the quadratic variable of state ownership.

#### *3.1.3. Control variables*

This article employs several control variables that were used in the previous empirical models. The control variables include financial leverage *(Lev)*, firm size *(Size)*, the ratio of invested capital *(Capex)*, the ratio of market-to-book value *(Tobin'Q)*, cash flows *(Cashflows)* and return on total assets *(ROA)*. I also include year dummies *(Year) and* industry dummies *(Industry)* to account for contemporaneous correlations in the errors across firms and industry-specific characteristics, respectively. These two dummies are treated as exogenous variables as adopted in Koerniadi et al. (2014), Jiraporn and Lee (2017). The calculation is expressed as in Table 1.

### *3.2. Empirical model*

The original model to estimate the non-linear relationship is expressed as follows:

$$y = \alpha + \beta_1 x + \beta_2 x^2 \qquad (**)$$

Thus, the non-linear relationship between state ownership and corporate risk-taking is formed as follows:

$$Risk\text{-}taking_{it} = \alpha + \beta_1 State_{it} + \beta_2 State_{it}^2 + \beta_3 Controls_{it} + \varepsilon_{it} \qquad (***)$$

Almost all research on corporate governance acknowledges three potential sources of endogeneity that lead to serious consequences for inference, namely unobservable heterogeneity of company characteristics, simultaneous effects between variables and dynamic characteristics of the model (Wintoki et al., 2012). I therefore follow Wintoki et al. (2012) to employ a dynamic panel system-GMM for controlling all three types of endogeneity. The method relies on lags of the dependent and explanatory variables which are used as instrumental variables. Lags of corporate risk measures (dependent variable) are included in the model to capture the dynamic impact of past risk-taking on current value. The dynamic model forms: *risk-taking = f (past risk-taking, ownership structure, firm characteristics, fixed effects)*. Therefore, the following empirical

model is formed to examine the non-linear impact of state ownership on corporate risk-taking:

$$Risk\text{-}taking_{it} = \alpha_0 + \alpha_1 Risk\text{-}taking_{it-1} + \beta_1 State_{it} + \beta_2 State_{it}^2 + \gamma Control_{it} + \theta X_{it} + \varepsilon_{it} \quad (****)$$

Where *i* denotes the firm, *t* denotes the time period. *Risk-taking* is the dependent variable in terms of total risk and idiosyncratic risk. $Risk\text{-}taking_{t-1}$ is the first lag of the dependent variable. *State* is the independent variable which represents the share-holding ratio of the state in the firm, $State^2$ is the square of state ownership variable. *Control* refers to control variables, including firm size *(Size)*, financial leverage *(Lev)*, cash flows (*Cashflows)*, invested capital *(Capex)*, market-to-book ratio (*Tobin's Q*) and return on total assets *(ROA)*. *X* represents year and industry fixed effects, $\varepsilon$ is error term.

Table 1: Description of the variables

| Variables | Name | Description | References |
|---|---|---|---|
| **Risk-taking measures** | | | |
| Total risk | *Stdret* | The standard deviation of weekly stock returns in each year | Cheng (2008), Koerniadi et al. (2014), Jiraporn and Lee (2017) |
| Idiosyncratic risk | *Ivol* | The standard deviation of the residuals from the market model<br>Where:<br>The residuals ($\varepsilon_{i,t}$) from the market model:<br>$r_{i,t} = \alpha_i + \beta_i r_{M,t} + \varepsilon_{i,t}$<br>(*i* denotes the firm, *M* denotes the market, t denotes time period) | Akbar et al. (2017), Jiraporn and Lee (2017)<br>Adam et al. (2005) |
| **State ownership variable** | | | |
| State ownership | *State* | $\frac{\text{The number of shares held by the sta}}{\text{The total number of shares}}$ | Wei et al. (2005), Boubakri et al. (2013), Phung and Mishra (2016), Vo et al. (2020) |
| Squared state ownership | $State^2$ | The squared proportion of state ownership | Wei et al. (2005), Phung and Mishra (2016), Vo et al. (2020) |
| **Control variables** | | | |
| Firm size | *Size* | The natural logarithm of book value of total assets | Cheng (2008), Nakano and Nguyen (2012), Nguyen (2012), Huang and Wang (2014), Akbar et al. (2017) |
| Financial leverage | *Lev* | $\frac{\text{Total debt}}{\text{Total assets}}$ | Cheng (2008), Nakano and Nguyen (2012), Huang and Wang (2014), Akbar et al. (2017) |
| Capital expenditures | *Capex* | $\frac{\text{Capital expenditures}}{\text{Total assets}}$ | Nakano and Nguyen (2012), Huang and Wang (2014), Jiraporn and Lee (2017) |
| Free cash flows | *Cashflows* | $\frac{\text{The free cash flows}}{\text{The book value of the assets}}$ | Jiraporn and Lee (2017) |
| Market to book value ratio | *Tobin' Q* | $\frac{\text{The market value of the assets}}{\text{The book value of the assets}}$ | Huang and Wang (2014), Akbar et al. (2017) |
| Return on total assets | *ROA* | $\frac{\text{EBIT}}{\text{Total assets}}$ | Boubakri et al. (2013), Huang and Wang (2014) |
| Industry dummies | *Industry* | A dummy variable for each industry sector | Koerniadi et al. (2014), Jiraporn and Lee (2017) |
| Year dummies | *Year* | A dummy variable for each year | Jiraporn and Lee (2017) |

*Source*: Author.

### *3.3. Data description*

#### *3.3.1. Data*

This study utilizes a dataset of listed firms on the Ho Chi Minh Stock Exchange and Hanoi Stock Exchange in the period 2007-2017. The firms' data was obtained from the annual audited financial reports, which is provided by FiinGroup, while the stock prices data was available on the two Stock Exchanges. Outliers were removed from the dataset using quantitative regression techniques to avoid producing misleading results. Financial institutions, such as securities companies, banks and insurance companies are excluded because of the differences in business and financial characteristics. Companies with discontinuous data within 5 years were excluded from the research sample as well. The final sample includes 577 non-financial listed firms which adequately represent the Vietnamese stock market. Additionally, the impressive empirical studies conducted by John et al. (2008), Faccio et al. (2011), Wintoki et al. (2012) and Boubakri et al. (2013) used outdated datasets, but the results remained consistent and highly representative when applied to a sample spanning over 10 years. This study employs data in the period of 11 years which are sufficient for a single country study to draw regularity conclusions as well as any reasonable empirical test (Uddin, 2015). So, the research results still ensure regularity and can serve as a reference for later stages.

#### *3.3.2. Descriptive statistics*

Table 2 reports the descriptive statistics of variables that were employed in the empirical model (****). As can be seen from the table, the mean value of corporate risk-taking determined by total risk and idiosyncratic risk is in turn 0.1338 and 0.0542, respectively. As regards state ownership, the mean value of the state variable is 0.278. It means that the average percentage of state ownership in firms is 27.8 per cent.

Table 3 indicates the Pearson correlation matrix between the explanatory variables used in this study. The low correlation between them indicates that the possibility of collinearity among variables that influence the regression results is eliminated.

Table 2: Descriptive statistics

| Variables | Mean | Median | Std. Dev | Max | Min |
|---|---|---|---|---|---|
| *Stdret* | 0.1338 | 0.1205 | 0.0660 | 0.0005 | 0.2950 |
| *Ivol* | 0.0542 | 0.0514 | 0.0198 | 0.0068 | 0.1059 |
| *State* | 0.278 | 0.2800 | 0.249 | 0.0000 | 0.8250 |
| *Size* | - 0.9295 | -0.9983 | 1.4242 | -4.0863 | 2.4633 |
| *Lev* | 0.5017 | 0.5286 | 0.2280 | 0.00002 | 0.9892 |
| *Cashflows* | 0.0101 | 0.0878 | 0.0795 | -0.0616 | 0.2926 |
| *Tobin's Q* | 1.0279 | 0.9598 | 0.3304 | 0.3277 | 1.7169 |
| *ROA* | 0.0656 | 0.0513 | 0.0858 | -0.9960 | 0.7837 |
| *Capex* | 0.0057 | -0.0009 | 0.0413 | -0.0759 | 0.0841 |

*Source*: Author estimation by STATA.

Table 3: Correlation coefficient matrix

| Variables | State | Size | Lev | Capex | Cash flows | Tobin's Q | ROA |
|---|---|---|---|---|---|---|---|
| *State* | 1,000 | | | | | | |
| *Size* | 0,065*** | 1,000 | | | | | |
| *Lev* | 0,106*** | 0,326*** | 1,000 | | | | |
| *Capex* | -0,117*** | 0,074*** | 0,072*** | 1,000 | | | |
| *Cashflows* | 0,179*** | -0,043*** | -0,387*** | 0,020 | 1,000 | | |
| *Tobin's Q* | 0,137*** | 0,113*** | -0,071*** | 0,032** | 0,459*** | 1,000 | |
| *ROA* | 0,101*** | -0,045*** | -0,398*** | 0,064*** | 0,849*** | 0,394*** | 1,000 |

*Source*: Author estimation by STATA.

## 4. Results and discussions

Table 4 provides estimating outcomes of the non-linear impact of state ownership on corporate risk-taking in Vietnam by the two-step system GMM approach.

As can be seen, the one-year lagged value of dependent variables receives the positive sign significantly while the number of instruments is less than the number of groups, indicating the dynamic character of the model specification as well as the appropriate estimator. AR (1) and AR (2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The p-value of AR(1) test is less than 0.05 while the AR(2) test is greater than 0.1, suggesting no serial correlation in all models. The p-value of the Hansen test of over-identification is higher than 0.05, demonstrating that the instruments

used in the model are valid. The p-value of the differences in the Hansen test of overidentification is also greater than 0.1 indicating the exogeneity of the instruments used in level equations, suggests that the instruments used in this study are exogenous.

The non-linear effect of state ownership on corporate risk-taking involved in risk measuring by total risk is presented in column (1), whereas column (2) reveals the result of risk determining by idiosyncratic risk. The results show that state ownership (State) has a negative impact while state ownership variable square ($State^2$) has a positive impact on the risk-taking variable. It implies that state ownership has a non-linear (U-shaped) impact on risk-taking at Vietnamese listed firms. The impact of State and $State^2$ on corporate risk-taking are significant (at 1% level) and consistent, regardless of how risk-taking is measured. This result is consistent with the theory of principal-principal conflict as well as the empirical evidence of Uddin (2015) in UEA. To go further on this relationship, I conduct the robustness check to confirm the non-linearity U-shaped correlation between two interest factors.

Table 4: Regression results

| **Dependent variable** | *Stdret* | *Ivol* |
|---|---|---|
| | *(1)* | *(2)* |
| $Stdret_{t-1}$ | 0.1514*** | |
| | (19.49) | |
| $Ivol_{t-1}$ | | 0.2280*** |
| | | (39.61) |
| *State* | -0.0535*** | -0.0183*** |
| | (-6.20) | (-4.90) |
| $State^2$ | 0.0603*** | 0.0240*** |
| | (4.69) | (4.15) |
| *Size* | -0.0034*** | -0.0042*** |
| | (-3.85) | (-22.57) |
| *Lev* | -0.0089 | 0.0015 |
| | (-1.63) | (1.29) |
| *Capex* | 0.1642*** | 0.0178*** |
| | (8.16) | (5.42) |
| *Cashflows* | 0.0342 | 0.0009 |
| | (1.37) | (0.18) |
| *Tobin's Q* | 0.0090*** | 0.0026*** |
| | (3.03) | (4.04) |
| *ROA* | -0.0891*** | -0.0106** |
| | (-4.61) | (-2.16) |
| *i.year* | yes | yes |
| *i.industry* | yes | yes |
| *Obs* | 3001 | 2924 |
| *No. groups* | 547 | 547 |
| *No. instruments* | 417 | 480 |
| *AR(1) test (p-value)* | 0.000 | 0.000 |
| *AR(2) test (p-value)* | 0.299 | 0.244 |
| *Hansen test over-identification (p-value)* | 0.100 | 0.225 |
| *Diff-in-Hansen test of exogeneity (p-value)* | 0.711 | 0.098 |

*Note*: *, ** and *** represent significance at 10%, 5%, and 1% levels, respectively.
*Source*: author estimation by STATA.

*Robustness tests*

I carry out two robustness tests with two variables instead of *State*, namely non-control state-owned ($State_{NonControl}$) and control state-owned ($State_{Control}$). The former determines the effect of non-control state-ownership on corporate risk-taking in the situation where the percentage shareholding of the state is below 50%, whereas the latter examines the relationship in the case of shares held by the government being more than 50%. These are two dummy variables. $State_{NonControl}$ is equal to one if the state ownership is less than fifty percent and zero for otherwise. $State_{Control}$ is equal to one if the percentage ownership of the state is more than fifty percent, while others are zero (Uddin, 2015).

The estimate results in Table 5 consistently show that non-control state-owned negatively affects, while control state-owned positively affects, risk-taking at Vietnamese listed firms. This regression result supports the idea that minority state ownership reduces corporate risk-taking while state control ownership leads to the expansion of risky behavior. This investigation has reinforced the non-linear U-shaped pattern relationship between state ownership and corporate risk-taking in Vietnam.

Table 5: The robustness tests

| Dependent variable | Test-A | | Test-B | |
|---|---|---|---|---|
| | *Stdret* | *Ivol* | *Stdret* | *Ivol* |
| | *(3)* | *(4)* | *(5)* | *(6)* |
| $Stdret_{t-1}$ | 0.1007*** | | 0.1012*** | |
| | (6.12) | | (5.95) | |
| $Ivol_{t-1}$ | | 0.2082*** | | 0.2079*** |
| | | (9.73) | | (9.74) |
| $State_{NonControl}$ | -0.0116** | -0.0048** | | |
| | (-2.06) | (-2.27) | | |
| $State_{Control}$ | | | 0.0129** | 0.0043** |
| | | | (2.34) | (2.06) |
| *Size* | -0.0031* | -0.0022** | -0.0024 | -0.0022*** |
| | (-1.65) | (-2.80) | (-1.24) | (-2.81) |
| *Lev* | -0.0138 | 0.0097 | -0.0296* | 0.0103 |
| | (-0.85) | (1.45) | (-1.72) | (1.54) |
| *Capex* | 0.0335 | 0.0329 | 0.1042* | 0.0325 |
| | (0.70) | (1.58) | (1.95) | (1.57) |
| *Cashflows* | -0.0496 | -0.1356*** | -0.0318 | -0.1332*** |
| | (-0.94) | (-5.02) | (-0.55) | (-4.94) |
| *Tobin's Q* | -0.0143** | 0.0051* | -0.0152** | 0.0051* |
| | (-2.07) | (1.66) | (-2.02) | (1.67) |
| *ROA* | -0.2117*** | 0.0958*** | -0.2417*** | 0.0944*** |
| | (-4.80) | (5.30) | (-5.01) | (5.22) |
| *i.year* | yes | yes | yes | yes |
| *i.industry* | yes | yes | yes | yes |
| *Obs* | 2327 | 2549 | 2327 | 2549 |
| *No. groups* | 518 | 531 | 518 | 531 |
| *No. instruments* | 205 | 198 | 190 | 198 |
| *AR(1) test (p-value)* | 0.000 | 0.000 | 0.000 | 0.000 |
| *AR(2) test (p-value)* | 0.122 | 0.143 | 0.124 | 0.139 |
| *Hansen test over-identification (p-value)* | 0.071 | 0.134 | 0.051 | 0.131 |
| *Diff-in-Hansen test of exogeneity (p-value)* | 0.884 | 0.178 | 0.493 | 0.232 |

*Test-A:* $\text{Risk-taking}_{it} = \alpha_0 + \alpha_1 \text{Risk-taking}_{it-1} + \beta\ State_{NonControl\ it} + \gamma \text{Control}_{it} + \theta X_{it} + \varepsilon_{it}$

*Test-B:* $\text{Risk-taking}_{it} = \alpha_0 + \alpha_1 \text{Risk-taking}_{it-1} + \beta\ State_{Control\ it} + \gamma \text{Control}_{it} + \theta X_{it} + \varepsilon_{it}$

Where State_NonControl = 1 if the percentage ownership < 50%, and otherwise 0. State_ Control = 1 if the percentage ownership > 50%, and otherwise 0. Other variables are the same as those used in the previous model, and details are available in Table 1. Asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

*Source*: Author estimation by STATA.

## 5. Conclusions and implications

By using an unbalanced panel dataset and two-step System GMM estimator, this study contributes to empirical evidence concerning the non-linear relationship between state ownership and corporate risk-taking at non-financial Vietnamese listed firms from 2007 to 2017. This article employs two different proxies, including total risk and idiosyncratic risk, to measure corporate risk-taking. State ownership was designed by several approaches in terms of the state-owned percentage, the square of the state-owned percentage, non-control state-owned and control state-owned. The outcomes show that the impact of state ownership on corporate risk-taking is non-linear U-shaped. Particularly, at certain levels of share held by the government, state ownership reduces risk-taking behavior; beyond this threshold, additional levels of state ownership lead to excessive hazardous activities, nonetheless. It means that minority state ownership corresponds to lower corporate risk-taking, while majority state ownership associates with higher risk-taking behavior.

This paper may be considered a pioneer study on this topic in Vietnam as well as making certain contributions to the existing literature by clarifying the non-linear impact of state ownership on corporate risk-taking. The research result is reliable and valuable thanks to the strongly significant regression results and robustness tests consistently.

The significant non-linear U-shaped impact of state ownership on a firm's risk-taking should be paid attention to by Vietnamese authorities. It is believed that state ownership affects firm performance negatively because state-owned companies focus on goals such as serving society and supporting the implementation of state policies instead of maximizing the value of the company (Vickers & Yarrow, 1991; Boycko et al., 1996; Dyck, 2001). Therefore, for companies that put profit goals first as well as not involved in social security issues, the percentage of state owners should be reduced as much as possible.

Their primary concern is sustainable profits and long-term stable existence. Therefore, they will tend to be cautious with venture projects due to fear of uncertainty about the income stream received in the future. This is essential for a healthy and sustainable financial market in the long term. By contrast, for companies that are established to carry out such government objectives as public employment, social stability, and political control over the economy, the government should be a majority shareholder. It is because of the fact that huge capital investments, long-time capital recovery projects, policy-oriented or socially beneficial purposes are extremely important as well as associated with a great risk level. Private firms are not interested in engaging in such fields, so the role of state-owned firms is inconvertible.

## References


Aabo, T., Pantzalis, C., & Park, J. C. (2017). Idiosyncratic volatility- An indicator of noise trading. *Journal of Banking & Finance*, 75, 136–151. https://doi.org/10.1016/j.jbankfin.2016.11.003

Adams, R. B., Almeida, H., & Ferreira, D. (2005). Powerful CEOs and their impact on corporate performance. *Review of Financial Studies, 18*(4), 1403–1432. https://doi.org/10.1093/rfs/hhi030

Akbar, S., Kharabsheh, B., Poletti-Hughes, J., & Ali Shah, S. H. (2017). Board structure and corporate risk-taking in the UK financial sector. *International Review of Financial Analysis.* https://doi.org/10.1016/j.irfa.2017.02.001

Boubakri, N., Cosset, J. C., & Saffar, W. (2013). The role of state and foreign owners in corporate risk-taking: Evidence from privatization. *Journal of Financial Economics*, *108*(3), 641–658. https://doi.org/10.1016/j.jfineco.2012.12.007

Boycko, M., Shleifer, A. & Vishny, R. (1996). A theory of privatization. *Economic Journal*, 106, 309-319.

Cheng, S. (2008). Board size and the variability of corporate performance. *Journal of Financial Economics, 87*(1), 157–176. https://doi.org/10.1016/j.jfineco.2006.10.006

Claessens, S., Djankov, S., Fan, J. P. H., & Lang, L. H. P. (2002). Disentangling the incentive and entrenchment effects of large shareholdings. *Journal of Finance, 57*(6), 2741–2771. https://doi.org/10.1111/1540-6261.00511

Dharwadkar, R., George, G., & Brandes, P. (2000). Privatization in emerging economies: An agency theory perspective. *Academy of Management Review, 25*(3), 650–669. https://doi.org/10.2307/259316

Dyck, A. (2001). Privatization and corporate governance: Principles, evidence, and future challenges. *The World Bank Research Observer, 16*, 59–84. https://ssrn.com/abstract=873694

accio, M., Marchica, M.-T., & Mura, R. (2011). Large shareholder diversification and corporate risk-taking. *Review of Financial Studies, 24*(11), 3601–3641. https://doi.org/10.1093/rfs/hhr065

Fogel, K., Morck, R., & Yeung, B. (2008). Big business stability and economic growth: Is what's good for General Motors good for America? *Journal of Financial Economics, 89*, 83–108 https://doi.org/10.1016/j.jfineco.2007.06.004

Huang, Y. S., & Wang, C. J. (2014). Corporate governance and risk-taking of Chinese firms: The role of board size. *International Review of Economics and Finance*. https://doi.org/10.1016/j.iref.2014.11.016

Jiraporn, P., & Lee, S. M. (2017). How do independent directors influence corporate risk-taking? Evidence from a quasi-natural experiment. *International Review of Finance.* http://doi.org/10.2139/ssrn.2988769

John, K., Litov, L., & Yeung, B. (2008). Corporate governance and risk-taking. *The Journal of Finance, 63*(4), 1679–1728. https://doi.org/10.1111/j.1540-6261.2008.01372.x

Khaw, K. L., Liao, J., Tripe, D., & Wongchoti, U. (2016). Gender diversity, state control, and corporate risk-taking: Evidence from China. *Pacific-Basin Finance Journal, 39*, 141–158. https://doi.org/10.1016/j.pacfin.2016.06.002

Koerniadi, H., Krishnamurti, C., & Tourani-Rad, A. (2014). Corporate governance and risk-taking in New Zealand. *Australasian Journal of Management, 39*(1), 3–18. https://doi.org/10.1177/0312896213478332

Lassoued, N., Sassi, H., & Ben Rejeb Attia, M. (2016). The impact of state and foreign ownership on banking risk: Evidence from the MENA countries. *Research in International Business and Finance, 36*, 167–178. https://doi.org/10.1016/j.ribaf.2015.09.014

Nakano, M., & Nguyen, P. (2012). Board size and corporate risk-taking: Further evidence from Japan. *Corporate Governance: An International Review, 20*(4), 369–387. https://doi.org/10.1111/j.1467-8683.2012.00924.x

Phung, D. N., & Mishra, A. V. (2015). Ownership structure and firm performance: Evidence from Vietnamese listed firms. *Australian Economic Papers, 55*(1), 63–98. http://hdl.handle.net/10.1111/1467-8454.12056

Thomsen, S., & Pedersen, T. (2000). Ownership structure and economic performance in the largest European companies. *Strategic Management Journal, 21*(6), 689–705. https://www.jstor.org/stable/3094306

Uddin, H. (2015). Effect of government share ownership on corporate risk-taking: Case of the United Arab Emirates. *Research in International Business and Finance, 34*, 1–35. https://doi.org/10.1016/j.ribaf.2015.09.033

Vickers, J., & Yarrow, G. (1991). Economic perspectives on privatization. *Journal of Economic Perspectives, 5*, 111–132. https://doi.org/10.1257/jep.5.2.111

Vo, V. D., Tran, T. V. T., & Dang, T. P. N. (2020). The impact of ownership structure on listed firms' performance in Vietnam. *Journal of Asian Finance, Economics and Business. 7*(10), 195–203. http://doi.org/10.13106/jafeb.2020.vol7.no11.195

Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics, 105*(3), 581–606. https://doi.org/10.1016/j.jfineco.2012.03.005

Young, M. N., Peng, M. W., Ahlstrom, D., Bruton, G. D., & Jiang, Y. (2008). Corporate governance in emerging economies: A review of the principal–principal perspective. *Journal of Management Studies, 45*(1), 196–220. https://doi.org/10.1111/j.1467-6486.2007.00752.x

Zhu, W., & Yang, J. (2016). State ownership, cross-border acquisition, and risk-taking: Evidence from China's banking industry. *Journal of Banking & Finance, 71*, 133–153. https://doi.org/10.1016/j.jbankfin.2016.05.004