Financial Reporting Quality, Corporate Governance, and Idiosyncratic Risk: Evidence from a Frontier Market

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Abstract

We extend current literature by providing empirical evidence on the impacts of financial reporting quality and corporate governance mechanism - two firm-level determinants that are strongly affected by the unique market setting and regulatory framework in emerging/frontier markets - and idiosyncratic risk in Vietnam. Utilizing different panel data analysis techniques, we find high-quality financial reports can mitigate firm-specific risk. Firms with high state ownership tend to have lower idiosyncratic risk too, implying the monitoring role of the government. We also document a positive link between board size and firm specific risk. Our results are thus beneficial for industry regulators and firms in ensuring good governance and reporting framework to better manage firm risk.

***JEL classification**:* G32, G11, G15

Keywords: Idiosyncratic risk, financial reporting quality, corporate governance, Vietnam

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1. Introduction

According to standard asset pricing theory (Capital Assets Pricing Model-CAPM), the total risk of a stock comprises systematic risk and unsystematic risk. Systematic risk or market risk is governed by the market and unsystematic risk (so-called idiosyncratic risk) is firm-specific risk. As idiosyncratic risk can be reduced through sufficient diversification, investors are rewarded for bearing systematic risk only (Markowitz, 1952; Sharpe, 1964; Lintner, 1965; Black, 1972). However, recent literature brings about questions to the above assumption since financial status or personal choice might prevent investors from holding well-diversified portfolio. Further research supports the questions, for example Goetzmann and Kumar (2008) who reveal that roughly 75 percent of investment portfolios comprising less than three stocks in the sample of more than 62,000 U.S. households in the period 1991-1996. Campbell et al. (2001) point out the extreme diversification of 50 stocks (at least) per portfolio is to spreading investment risks. Consequently, idiosyncratic risk should be taken into account beside systematic risk in asset pricing (Lehmann, 1990).

Extant research also documents a surge in idiosyncratic risk (see for example, Morck, Yeung, and Yu, 2000) which is argued to have significant implications for portfolio management, investment arbitrage, and management compensation policies (Rajgopal and Venkatachalam, 2011). As investors tend to expose to the idiosyncratic risk, they should be rewarded for bearing this type of risk too (Nguyen *et al*., 2019). Arbitrageurs seeking advantages in mispriced securities also take into consideration of idiosyncratic risk (Campbell *et al*., 2001). Many funds are also found not holding mean-variance efficient portfolios or portfolios representing the market portfolio to earn abnormal returns (Campbell et al., 2001; Hovey, 2015; Malkiel and Xu, 1997; Xu and Malkiel, 2003). Given the important role of idiosyncratic risk, managers' efforts in managing the firm's idiosyncratic risk expand gradually from different perspectives to indirectly take control of the investment resources to fall into their companies.

In this paper, we examine how idiosyncratic risk is influenced by financial reporting quality and corporate governance characteristics – two important firm-specific qualities decided at the discretion of management. Financial reporting quality is defined as "the precision with which financial reporting conveys information about the firm's operations, in particular its expected cash flows, that inform equity investors" (Biddle *et al*., 2009). Particularly, we aim to address the following research question: How do financial reporting quality and corporate governance characteristics impact firm idiosyncratic risk?

Our study is motivated by at least three main reasons. First, prior studies have provided evidence of corporate operation and information flow influences idiosyncratic risk and suggested that idiosyncratic risk can be managed by managers at some certain perspectives, namely, firm size (Bali *et al*., 2005), leverage, firm focus (Campbell *et al*., 2001; Dennis and Strickland, 2004), structure of ownership (Xu and Malkiel, 2003), firm age (Pastor and Veronesi, 2003), fundamentals volatility (Wei and Zhang, 2005) and earning quality (Hutton *et al*., 2009; Rajgopal and Venkatachalam, 2011). However, a review of literature also shows that most related studies shed light on the U.S. stock market or other developed countries and there is a lack of research regarding firm idiosyncratic risk in emerging stock markets given their weak regulatory/reporting frameworks. Second, importantly, extant studies seem to solely focus on the link between financial reporting quality and idiosyncratic risk (see for example: Rajgopal and Venkatachalam, 2011; Zhou *et al*., 2017) or between corporate governance characteristics (see for example: Cheng, 2008; Pathan, 2009; Adams *et al*., 2010, Hovey, 2015) and the risk. Our study is among pioneering studies that extends the current literature by examining the impact of both corporate governance characteristics and financial reporting quality on firm idiosyncratic risk. Given the significant evidence on the impact of corporate governance on idiosyncratic risk,

excluding it from the model could lead to a biased result. Third, as being an important frontier market for stock trading in Asia (Bekaert and Harvey, 2003; Vo and Phan, 2019),Vietnam's legal framework regarding the investment environment is yet to be fulfilled with weak information transparency and corporate governance (Batten and Vo, 2019). Moreover, the market is also characterized by daily price limits and short-selling bans which can affect stock idiosyncratic risk (Zhou *et al*., 2017). High state-ownership is also a prominent feature in Vietnam as found by Vo (2018) that these firms tend to have more financial and political advantages than their non state-owned peers thus tend to take less risks. Hence, we believe to find unique results on the influence of financial reporting quality and corporate governance characteristics on firm idiosyncratic risk in an important frontier market Vietnam.

Employing different econometric techniques of panel data analysis, we find a significant negative link between financial reporting quality and firm idiosyncratic risk suggesting that better financial reporting quality is associated with lower firm idiosyncratic risk. Among corporate governance characteristics (board variables: board size, CEO duality; stock ownership variables: state ownership, CEO ownership), state ownership is consistently found to be negatively related to firm idiosyncratic risk, suggesting that high state-ownership firms tend to have less idiosyncratic risk. Larger board size is however associated with higher idiosyncratic risk. Such finding implies an important role of corporate governance in managing firm risks. The results are robust to different financial reporting quality measures, data analysis methods, and multiple endogeneity tests. We also control for several firm specific factors and find various relationships.

The study provides empirical evidence for idiosyncratic risk determination in a new context and make significant contributions to prior studies. To the best of our knowledge, this is the foremost study focusing on the effect of both financial reporting quality and corporate governance on firm idiosyncratic risk. We extend the work of Zhou *et al*., (2017) by adding two main dimensions of corporate governance characteristics including board variables and stock ownership variables (Larcker *et al*., 2007). Our study is the first to examine idiosyncratic risk and its relationship with financial reporting quality and corporate governance characteristics in Vietnam - an important frontier and transitional economy which we believe offers unique financial reporting quality and corporate governance characteristics. Vietnam market is claimed to have a less stringent regulatory and governance framework and high state ownership (Batten and Vo, 2019) compared to other developed economies. Our findings stress the importance of having a better reporting framework to reduce idiosyncratic risk and highlights the role of state-ownership and board size in firm risk-taking behavior.

The remainder of the paper is organized as follows. Section 2 reviews relevant literature, theories, and empirical research on the relationship between financial reporting quality, corporate governance characteristics, and firm idiosyncratic risk from which relevant hypotheses are proposed. Section 3 describes the data and method employed. Section 4 present the empirical results. Section 5 concludes the study.

2. Literature Review

2.1 Firm idiosyncratic risk

The total risk of a firm's stock comprises both systematic and unsystematic (idiosyncratic) risk. The idiosyncratic risk, also known as the firm specific risk, reflects the change in stock price as the result of the events primarily impact only on that firm and the systematic risk is more of the macroeconomic effects on stock price's variance (Bansal and Clelland, 2004). Idiosyncratic volatility is considered as the most significant factor explaining the firm's return volatility (Campbell et al., 2001). Prior research documents an increase in idiosyncratic risk over time

(Morck, Yeung, and Yu, 2000) which is argued to have significant implications for portfolio management, investment arbitrage, and management compensation policies (Rajgopal and Venkatachalam, 2011). Given the important role of the risk, prior research has shown various determinants of idiosyncratic such as leverage (Bhandari, 1988), institutional ownership, firm focus (Dennis and Strickland, 2004), firm size (Malkiel and Xu, 1997), financial reporting quality (Zhou et al., 2017)… (see related discussion in Campbell et al., 2001; Dennis and Strickland, 2004). In accordance with this line of research, we focus on the influence of financial reporting quality and corporate governance mechanism on firm idiosyncratic risk. The following sections discuss relevant literature from which hypotheses are proposed.

2.2 Financial reporting quality and firm idiosyncratic risk

Financial reporting quality refers "the precision with which financial reporting conveys information about the firm's operations, in particular its expected cash flows, that inform equity investors" (Biddle et al., 2009). High-quality financial reports help reduce information asymmetry problem by providing timely and accurate information for investors (Zhou et al. 2017). Based on such information, investors are more confident and able to make sound investment valuation, thereby lowers the idiosyncratic risk for the stock. This is also in accordance with theory that noisy earnings are caused by poor earning quality (e.g., Diamond and Verrecchia 1991; Leuz and Verrecchia 2000; Easley and O'Hara 2004). Extant research has found empirical evidence for the negative association between reporting quality and firm idiosyncratic risk, suggesting that high quality information reduces the level of firm-specific risk. For example, Dasgupta et al. (2010) show that U.S. firms disclosing more information in a more transparent environment tend to have lower idiosyncratic risk. Rajgopal and Venkatachalam (2011) studying idiosyncratic volatility in the U.S. market from 1962 to 2001 also find that higher return volatility is associated with low financial reporting quality. Zhou et al. (2017) report similar relationship between financial reporting quality and idiosyncratic volatility for Chinese listed firms (2003-2012), indicating that high quality financial information helps reduce firm-specific risk.

It should be noted that several studies document a positive link between financial reporting quality and firm idiosyncratic risk. Hutton et al. (2009) study the relationship between firm financial information quality and stock returns volatility for U.S. firms. By using discretionary accruals as opacity measurement, they show a negative relationship between opaqueness and R^2 (stock return synchronicity), suggesting lower level of informativeness can lead to lower stock idiosyncratic volatility. The authors explain that opaque financial reports reveal less firm specific information to affect its stock price, thus less idiosyncratic risk. Aman (2011) investigates how information quality, including management forecasts and media coverage affect firm-specific stock return variation in Japan, and finds that less management forecast errors and more media coverage are related with higher firm-specific volatility. Such inconsistent findings are found in developed markets using different aspects of financial reporting quality may not be applicable to emerging markets. As a result, informed from the relevant theories and empirical evidence discussed above, we expect a negative link between financial reporting quality and firm idiosyncratic risk (H1)

H1: Financial reporting quality is negatively related to idiosyncratic risk.

2.3 Corporate governance mechanism and idiosyncratic risk

Although there have been studies investigate the relationship between corporate governance and firm risk (e.g., Panousi and Papanikolaou, 2012; Zhu and Yang, 2016) which is guided by Agency theory (Jensen and Meckling, 1976), little research has been done regarding the association between corporate governance characteristics and firm idiosyncratic risk (Hovey, 2015), especially for emerging countries (except China). The results and implications may not be

applied to developing markets due to differences in institutional settings (e.g., market frictions, governmental intervention…). Informed by Larcket et al. (2007), we focus on two main groups of corporate governance characteristics: board variables including board size, CEO duality and stock ownership variables including state ownership and CEO ownership. Empirical studies also show supporting evidence on the relationship between these variables and firm idiosyncratic risk.

2.3.1 Board size and idiosyncratic risk

Board of directors is to monitor the executive team and thus help address the agency problem. There is however little research on board size and firm idiosyncratic risk. Preliminary evidence on a significant relationship between risk-taking and board size was first documented in social psychology and organizational behavior studies. The investigation conducted by both Wallach, Kogan and Bem (1964) and Moscovici and Zavalloni (1969) indicates the size of the firm's board of management negatively influences the risk-taking level. Larger board tend to better monitor the firm, thus can reduce risks (Hovey, 2015). However, big board can have communication problems and thus poor information flows (Hovey, 2015; Jensen, 1993; Lipton and Lorsch, 1992). Pham et al. (2012) find that bigger boards tend to have higher weighted average cost of capital (WACC) suggesting high information asymmetry thus high level of risks. From the two strands of literature, it is not clear about the relationship between board size and idiosyncratic risk, we posit two competing hypotheses:

H2a: Board size is negatively related to idiosyncratic risk.

H2b: Board size is positively related to idiosyncratic risk.

2.3.2 CEO duality and idiosyncratic risk

Informed by Agency theory (Jensen and Meckling, 1976), CEO duality is argued to upsurge idiosyncratic risk. Chances for the CEO to exploit own's rights to preferably working with those with a low tendency of disagreement or family members are very likely to happen (Westphal and Zajac, 1995), which can bring about a higher risk to a firm's return. CEO duality poses a positive relationship with firm-specific uncertainty (Alam and Ali Shah, 2013; Sun and Liu, 2014). Following prior research, we posit that CEO duality has a positive correlation with firm specific risk as follows:

H3: CEO duality is positively related to idiosyncratic risk.

2.3.3 State ownership and idiosyncratic risk

Prior studies show mixed findings on the relationship between state ownership and firm risks across different contexts. For example, Zhu and Yang (2016) find that state-owned banks in China tend to take on more risks. They argue that firms believe that the financial support of the state (bail-out expectation) and their close relationship with the banks can secure them from financial problems, thus are prone to involve in risky investments (Zhu and Yang, 2016). However, other studies show a negative influence of state ownership on firm risk. For instance, Vo (2018) investigating the relationship between state ownership and firm risk-taking behavior for listed firms in Vietnam shows that firms with high level of state-ownership take less risks. State-owned firms are financially and politically supported by the government; thus, they tend to unfavor risky activities (Vo, 2018). These large and influential shareholders (state) are likely to be more conservative and try to mitigate risks (Shleifer and Vishny, 1986). Following that, we hypothesize that firms with high level of state ownership tend to have less idiosyncratic risk as follows.

H4: State ownership is negatively related to idiosyncratic risk.

2.3.4 CEO ownership and idiosyncratic risk

CEO ownership is one of the important mechanisms for firms to mitigate the agency cost and thus can affect firm risk-taking behavior. Although little research regarding CEO ownership and idiosyncratic risk has been conducted, several studies have investigated the relationship between executives' ownership level and firm risk. For example, Panousi and Papanikolaou (2012) show that high managers' share ownership is associated with a higher level of idiosyncratic risk for publicly traded firms in the U.S, which can be explained by poor managerial diversification. Similar with state, CEO is a big and influential shareholder, thus according to Shleifer and Vishny (1986), they tend to be cautious and try to minimize risk. Following that, we hypothesize:

H5: CEO ownership is negatively related to idiosyncratic risk.

3. Methodology

3.1 Data

Our sample includes all non-financial listed firms on Ho Chi Minh city stock exchange (HOSE) from 2010 to 2016 (with lagged variables are from 2009). Although established in 2000 (with only two listed firms), Vietnam stock market was not active until 2008-2009. Thus, we collected our data from 2009. Financial data are extracted from Thomson Reuter and corporation governance data are collected from Vietstock – a trusting local securities/stocks database (Le, 2019). Financial institutions such as banks, insurance firms, and financial service providers are excluded due to their special performance and risk-taking metrics. Corporate governance data are not available for many firms especially in early years, unfortunately. Thus we also exclude firms with missing governance data. The final sample contains 707 firm-year observations.

3.2 Variable measurement

3.2.1 Idiosyncratic risk

Following Xu and Malkiel (2003), Zhou *et al*. (2017) idiosyncratic volatility is measured using variance of idiosyncratic return.

$$\text{Var}(r_{it}) = \text{Var}(R_{it}) - \text{Var}(R_t^M) \quad (1)$$

Where:

R_{it}: Excess return of stock i over the risk-free rate (Vietnam government bond)

R_t^M: Excess return of market index (VNindex) over the risk-free rate

r_{it}: Idiosyncratic return

The idiosyncratic risk, denoted as $RISK^{ID}$, is calculated by the square root of $Var(r_{it})$ from (1). Yearly data are calculated using daily stock return data.

3.2.2 Financial reporting quality

We measure firm financial reporting quality using Rajgopal and Venkatachalam's (2011), Zhou *et al*. (2017) approach with two proxies: DD and ABACC. DD is presented by Dechow and Dichev (2002) and employed in many studies such as Francis *et al*. (2005), Srinidhi and Gul (2006), and Biddle *et al*., (2009) and calculated by the formula:

$$TCA_{it} = \alpha_0 + \alpha_1 CFO_{it-1} + \alpha_2 CFO_{it} + \alpha_3 CFO_{it+1} + \alpha_4 \Delta REV_{it} + \alpha_5 PPE_{it} + \varepsilon_{it} \quad (2)$$

Where:

CFO: Cash flow from operation

ΔREV: Change in revenue

PPE: Gross value of property, plant, and equipment

TCA: Total current accruals, which is determined based on another formula:

TCA = ΔCA – ΔCL – ΔCASH + ΔSTD

where:

ΔCA: Change in current assets

ΔCL: Change in current liabilities

ΔCASH: Change in cash
ΔSTD: Change in short-term debt

All variables are weighed by the average assets and i, t represent for firm and time, respectively. The residuals from (2) are used as a proxy (absolute values) for financial reporting quality (i.e., $DD_{it} = |\xi_{it}|$). High values of DD indicate poor financial reporting quality.

Also, following Rajgopal and Venkatachalam's (2011), Zhou *et al.* (2017), our second measure for financial reporting quality is informed from the modified Jones (1991) model with return on assets (ROA) from Kothari *et al.* (2005):

$$TA_{it} = \beta_0 + \beta_1(\Delta REV_{it} - \Delta AR_{it}) + \beta_2 PPE_{it} + \beta_3 ROA_{it} + \eta_{it} \quad (3)$$

Where:
ΔREV: Change in revenue
ΔAR: Change in accounts receivable
PPE: Gross value of property, plant, and equipment
ROA: Return on assets: net income divided by average total assets
TA: Total accruals. This variable is calculated as TA = TCA – DEPN
of which:
TCA: Total current accruals
DEPN: Depreciation and amortization

The residual (η_{it}) from (3) is the abnormal accrual (ABACC), and its squared value $ABACC^2$ is the second measure for financial reporting quality (Chen *et al*., 2011). The high value of $ABACC^2$ also means poor financial reporting quality.

3.2.3 Board and stock ownership variables

Regarding corporate governance characteristics, informed by Larcker *et al*. (2007), we focus on two main groups of corporate governance characteristics: board variables (including board size, CEO duality) and stock ownership variables (including State ownership and CEO ownership). Board size (BSIZE) is computed by the natural logarithm of the number of board directors (Alam and Ali Shah, 2013). CEO duality (DUO) is measured by a dummy variable which equates to 1 if CEO and chairperson are the same people, and 0 otherwise (Merz and Trabert, 2017). CEO ownership (CEO) and State ownership (STATE) are the percentage of a firm's shares owned by the CEO and the Government, respectively.

3.2.4 Control variables

Following prior studies (e.g., Wei and Zhang, 2005; Ang et al., 2009; Rajgopal and Venkatachalam, 2011; Zhou et al., 2017), we include the following variables as control variables in the study: cash flows from operations (CFO), firm leverage (LEV), age (AGE), Book/Market ratio (BM), stock returns (RET), firm size (SIZE), and return on assets (ROA). Particularly, smaller firms tend to suffer higher risk owing to its incapacity to handle risk (Brandt et al., 2010). Stock return is found to be positively associated with idiosyncratic risk (Zhou et al., 2017). Cashflow from operation is negatively related with volatility of stock return as firm profits usually link with good operation (Brown and Kapadia, 2007; Irvine and Pontiff, 2009). Firm leverage is positively associated with stock return volatility due to its higher vulnerability to financial distress (Fink et al., 2010). Age of firm and ROA are also found to lower the risk (Merz and Trabert, 2017). Table 1 demonstrates details of definitions and measurements of the variables.

Table 1. Variable description

Dependent Variable		
$RISK^{ID}$	Idiosyncratic return volatility	$RISK^{ID} = \sqrt{VAR(r_{it})}$
Independent Variables		
Financial Reporting Quality		
DD	High value suggests poor financial reporting quality	The absolute value of the residuals of Eq. (2)
$ABACC^2$	High value suggests poor financial reporting quality	Squared values of the residuals of Eq. (3)

Corporate Governance		
BSIZE	Board size	ln (number of directors on the board)
DUA	CEO Duality	Dummy variable: If the CEO is also the chairperson, DUA=1, otherwise: 0
STATE	State ownership	Percentage of a company's share owned by the government
CEO	CEO ownership	Percentage of a company's shares owned by the CEO
Control Variables		
CFO	Operating cash flows scaled by average total assets	$\frac{CFO_t}{Average\ total\ assets}$
CFO_lag1	Lagged value of operating cash flows scaled by average total assets	$\frac{CFO_{t-1}}{Average\ total\ assets}$
CFO_lead1	Lead value of operating cash flows scaled by average total assets	$\frac{CFO_{t+1}}{Average\ total\ assets}$
SIZE	Firm size: natural logarithm of total assets	$ln\ (total\ assets)$
LEV	Firm leverage: total debt divided by total assets	$\frac{Total\ debt}{Total\ assets}$
BM	Book value divided by market value of equity	$\frac{Book\ value\ of\ equity}{Market\ value\ of\ equity}$
RET	Annual buy-and-hold return	$\frac{P_t - P_{t-1}}{P_{t-1}}$
AGE	Firm age: natural logarithm of the number of years since listing	$ln\ (number\ of\ years\ since\ listing\ )$
ROA	Return on assets	$\frac{Net\ income}{Average\ total\ assets}$

3.3 Model specification

Building on and extending Zhou *et al.*'s (2017) work, we examine the following regression models (4) and (5) with panel data analysis techniques.

$$\boldsymbol{RISK_{it}^{ID}} = \beta_0 + \boldsymbol{\beta_1\, DD_{it-1}} + \boldsymbol{\beta_2\, BSIZE_{it-1}} + \boldsymbol{\beta_3\, DUA_{it-1}} + \beta_4\, \boldsymbol{STATE_{it-1}} + \beta_5\, \boldsymbol{CEO_{it-1}} + \beta_6\, CFO_{it} + \beta_7\, CFO_{it-1} + \beta_8\, CFO_{it+1} + \beta_9\, SIZE_{it-1} + \beta_{10}\, LEV_{it-1} + \beta_{11}\, RET_{it} + \beta_{12}\, BM_{it-1} + \beta_{13}\, AGE_{it-1} + \beta_{14}\, ROA_{it-1} + \alpha_{it} \qquad (4)$$

$$\boldsymbol{RISK_{it}^{ID}} = \beta_0 + \boldsymbol{\beta_1\, ABACC^2_{it-1}} + \boldsymbol{\beta_2\, BSIZE_{it-1}} + \boldsymbol{\beta_3\, DUA_{it-1}} + \boldsymbol{\beta_4\, STATE_{it-1}} + \boldsymbol{\beta_5\, CEO_{it-1}} + \beta_6\, CFO_{it} + \beta_7\, CFO_{it-1} + \beta_8\, CFO_{it+1} + \beta_9\, SIZE_{it-1} + \beta_{10}\, LEV_{it-1} + \beta_{11}\, RET_{it} + \beta_{12}\, BM_{it-1} + \beta_{13}\, AGE_{it-1} + \beta_{14}\, ROA_{it-1} + \alpha_{it} \qquad (5)$$

First, pooled panel data regression is run for models (4) and (5), controlling for industry dummies. Breusch-Pagan / Cook-Weisberg test is also conducted to test for heteroskedasticity problems in the data. As shown later in section 4, heteroskedasticity is not a problem in our study (insignificant $\chi 2$ values). Then Hausman tests are conducted to choose between Random Effects or Fixed Effects techniques. Endogeneity tests are also employed to adress endogeneity problems. The next section presents our findings in detail.

4. Results

4.1 Descriptive analysis

Table 2 displays the descriptive statistics of all variables in our study. In the period of research 2010-2016, $RISK^{ID}$ (idiosyncratic risk) has a mean value of 0.023 and a standard deviation of 0.007, respectively. Means and standard deviations of financial reporting quality are 0.009 and 0.002 for DD and 0.001 and 0.0003 for $ABACC^2$, respectively. Regarding firm-level board

variables, boards comprise from 3 members to 11 members with a mean of 6 members. Average values of State ownership and CEO ownership are 25.181% and 3.430% respectively. Table 3 describes firm industry/sector classification. Two dominant sectors are industrials (37.62% of total firms) and consumer goods (28.85% of total firms). Table 4 presents the pairwise correlation coefficients. Idiosyncratic risk is positively correlated with DD (r=0.129, p=0.001) and $ABACC^2$ (r=0.108, p=0.004), suggesting that idiosyncratic risk is negatively correlated with financial reporting quality (high $CC/ABACC^2$ means poor financial reporting quality). Among corporate governance variables, only State ownership is negatively correlated with idiosyncratic risk (r=-0.169, p<0.001). Table 4 does not show any multicollinearity issues with the data. VIF statistics also refuse the collinearity problem (Table 5).

Table 2: Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
RISK_ID	0.023	0.007	0.006	0.051
DD	0.009	0.002	0.006	0.013
ABACC2	0.0007	0.0003	0.0004	0.0012
BSIZE	1.740	0.208	1.099	2.398
DUA	0.300	0.459	0.000	1.000
STATE	25.181	23.750	0.0000	84.440
CEO	3.430	8.318	0.0000	59.883
SIZE	27.725	1.204	25.554	30.944
LEV	0.261	0.191	0.000	0.758
RET	0.050	0.514	-0.831	3.767
AGE	1.677	0.539	0.000	2.708
ROA	0.067	0.078	-0.717	0.677
BM	1.796	7.803	-80.387	179.488
CFO_lag1	0.063	0.134	-1.050	1.321
CFO_lead1	0.066	0.137	-1.050	1.321
CFO	0.071	0.152	-0.976	1.334

Table 3: Industry classification

Industry	Frequency	Percentage
Basic Materials	91	12.870
Consumer Goods	204	28.850
Consumer Services	35	4.950
Health Care	42	5.940
Industrials	266	37.620
Oil & Gas	21	2.970
Technology	13	1.840
Telecommunications	7	0.990
Utilities	28	3.960
Total	707	100

Table 4: Correlation table

	RISK_ID	DD	ABACC2	BSIZE	DUA	STATE	CEO	SIZE	LEV	RET	AGE	ROA	BM	CFO lag1	CFO lead1	CFO
RISK_ID	1.000															
DD	0.129***	1.000														
ABACC2	0.108***	0.462***	1.000													
BSIZE	0.057	-0.038	-0.018	1.000												
DUA	0.031	0.013	-0.020	0.038	1.000											
STATE	0.169***	-0.004	-0.012	-0.235***	-0.164***	1.000										
CEO	0.047	-0.019	0.004	0.026*	0.394***	-0.326***	1.000									
SIZE	-0.220***	-0.063*	0.024	0.216***	-0.041	-0.001	0.069*	1.000								
LEV	0.091**	0.019	0.024	-0.016	0.002	0.011	0.112***	0.311***	1.000							
RET	0.123***	-0.013	0.342***	0.036	-0.026	0.039	-0.002	-0.016	0.011	1.000						
AGE	-0.043	-0.406***	0.132***	0.091**	-0.108***	-0.105***	-0.058	0.045	-0.099***	0.225***	1.000					
ROA	-0.279***	0.051	-0.066*	-0.051	-0.001	0.130***	-0.067*	0.062	-0.457***	-0.084**	-0.086**	1.000				
BM	0.071*	-0.009	0.003	-0.020	-0.013	-0.001	0.000	-0.028	-0.038	0.063*	0.052	-0.044	1.000			
CFO_lag1	-0.050	0.106***	0.064*	0.005	-0.012	0.149***	-0.073*	-0.002	-0.191***	0.156***	-0.064*	0.151***	0.001	1.000		
CFO_lead1	-0.159***	-0.066*	-0.064*	0.048	-0.007	0.106***	-0.072*	0.087**	-0.042	-0.058	-0.036	0.191***	-0.020	0.049	1.000	
CFO	-0.104***	0.001	0.045	0.022	0.013	0.101***	-0.085**	0.044	-0.058	0.050	-0.014	0.177***	-0.089**	0.074**	0.035	1.000

*Note: *** p<0.01, ** p <0.05, *p<0.1*

4.2 Regression results

Table 6 show regression results of the relationship between financial reporting quality, corporate governance mechanism, and firm idiosyncratic risk. Supporting H1, we find a consistently negative relationship between financial reporting quality and idiosyncratic risk (positive coefficients of DD and $ABACC^2$ as high DD or $ABACC^2$ values indicate low financial reporting quality), suggesting that low financial reporting quality is associated with higher idiosyncratic risk. Our findings are consistent with Dasgupta *et al*. (2010), Rajgopal and Venkatachalam (2011), Zhou *et al*. (2017). The results are robust to different financial reporting quality measures and panel data analysis techniques. It can be explained that high-quality information in firm financial statements can help reduce the "surprise" in future stock prices, thus reduce idiosyncratic risk.

Among corporate governance characteristics (Board size, CEO duality, CEO ownership, and State ownership), we also find a significant relationship between board size, state ownership and idiosyncratic risk across all 4 models. Specifically, firms with high level of state ownership tend to have lower idiosyncratic risk, supporting H4. Consequently, the supervision from the government can help reduce the firm-specific risk. Financial and political supports from the government can discourage managers from taking risks too (Vo, 2018). On the other hand, board size is found to have a positive relationship with idiosyncratic risk, supporting H2b. Firms with a large board size tend to have higher idiosyncratic risk, which is partly consistent with Pham et al. (2012) who find a positive relationship between board size and firm cost of capital. Large board tend to have poor communication and free-rider problems, thus can lead to more firm-specific risk. CEO duality and CEO ownership do not have any significant relationship with idiosyncratic risk. Regarding control variables, size and cash flows from operation (CFO_lead) are found to have a negative relationship with idiosyncratic risk across all models. Big firms and those with high level of CFO tend to have lower idiosyncratic risk. Firm age is also negatively associated with the risk (only with ABACC2 proxy). On the other hand, annual buy-and-hold returns are positively related to idiosyncratic volatility, suggesting firms with high firm-specific risk are likely to have high returns.

4.3 Endogeneity tests

To address for endogeneity issues, we have conducted several tests including change analysis and two-stage least squares (2SLS) regressions with corporate governance instrumental variables. First, following Zhou *et al.* (2017), we run a change analysis between annual change in firm idiosyncratic risk and annual change in financial reporting quality (annual changes in the two proxies: DD and $ABACC^2$) with all the control variables (Table 7). Results show a consistent negative relationship between financial reporting quality and idiosyncratic risk (positive coefficients). We also employ 2SLS with corporate governance instrumental variables for two significant variables: state ownership and board size. Following Jiraporn *et al*. (2014), we use industry average of state ownership and board ownership as instrumental variables. The industry average values can be highly correlated with firm corporate governance characteristics (within the same industry) and less correlated with firm specific risk. In the first stage, industry average values of state ownership and board size are used to estimate firm state ownership and board size, respectively. The estimated values are then substituted in the main regressions to perform the second stage. Results (Table 8) confirm a negative relation between state ownership and idiosyncratic risk and a positive relation between board size and idiosyncratic risk.

RISK[ID]	DD				ABACC[2]			
	Pooled		Fixed Effect		Pooled		Random Effect	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
DD	0.335***	0.006	0.412***	0.000				
ABACC2					2.087**	0.032	2.167**	0.012
BSIZE	0.002*	0.091	0.004*	0.057	0.002*	0.074	0.003*	0.049
DUA	-0.00001	0.991	0.0005	0.539	-0.00004	0.946	0.00011	0.863
STATE	-0.00003**	0.020	-0.00001	0.805	-0.00003**	0.012	-0.00003**	0.036
CEO	-0.00002	0.559	-0.0001	0.105	-0.00002	0.467	-0.00004	0.349
SIZE	-0.001***	0.000	-0.002*	0.070	-0.001***	0.000	-0.001***	0.000
LEV	0.002	0.120	0.003	0.268	0.003	0.111	0.004*	0.064
RET	0.002***	0.002	0.001***	0.003	0.001**	0.013	0.001***	0.005
AGE	-0.001	0.225	0.001	0.342	-0.001***	0.007	-0.001**	0.031
ROA	-0.015***	0.000	0.001	0.852	-0.014***	0.000	-0.006	0.141
BM	0.00004	0.150	0.00004	0.114	0.00005	0.133	0.00005*	0.094
CFO_lag1	-0.00017	0.928	0.00047	0.803	0.00014	0.939	0.00027	0.877
CFO_lead1	-0.004**	0.039	-0.002	0.301	-0.004**	0.027	-0.003**	0.043
CFO	-0.002	0.264	0.001	0.503	-0.002	0.219	-0.001	0.577
cons	0.047***	0.000	0.064**	0.02	0.050***	0.000	0.052***	0.000
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.20				0.197			
F stat.	9.04***		2.62***		8.87***			

Wald Chi^2							99.57***	
Breusch-Pagan / Cook-Weisberg test: Chi^2	0.49	0.485			0.32	0.569		
Hausman test for RE/FE: Chi^2			32.49*	0.013			24.21	0.114

Table 6: Regression results of idiosyncratic risk on financial reporting quality and corporate governance

RISKID refers to firm idiosyncratic volatility. DD and ABACC2 are two proxies of financial reporting quality. CFO is the operating cash flows scaled by average total assets. CFO_lag1 is the operating cash flows year scaled by average total assets in the previous year, and CFO_lead1 is the operating cash flows scaled by average total assets in the following year. BSIZE is the board size, measured as the natural logarithm of board member number. DUA is a dummy variable, equals one if the CEO is the chairperson and 0 otherwise. STATE refers to the percentage of state ownership. CEO is the percentage of shares owned by the CEO. SIZE is the natural logarithm of total assets.

LEV is the firm's financial leverage computed as the ratio of total debt to total assets. RET refers to annual buy-and-hold return. AGE is computed as the natural logarithm of number of years since listing in HOSE. ROA is the return on assets, measured as the ratio of net income to total assets. BM: Book value of equity divided by market value of equity.

Note: *** $p<0.01$, ** $p<0.05$, *$p<0.1$

Table 7: Change analysis of idiosyncratic risk and financial reporting quality

Change_RISK^{ID} refers to annual changes in firm idiosyncratic volatility. Change_DD and Change_ABACC^2 are annual changes in DD and ABACC^2, respectively. CFO is the operating cash flows scaled by average total assets. CFO_lag1 is the operating cash flows year scaled by average total assets in the previous year, and CFO_lead1 is the operating cash flows scaled by average total assets in the following year. BSIZE is the board size, measured as the natural logarithm of board member number. DUA is a dummy variable, equals one if the CEO is the chairperson and 0 otherwise. STATE refers to the percentage of state ownership. CEO is the percentage of shares owned by the CEO. SIZE is the natural logarithm of total assets. LEV is the firm's financial leverage computed as the ratio of total debt to total assets. RET refers to annual buy-and-hold return. AGE is computed as the natural logarithm of number of years since listing in HOSE. ROA is the return on assets, measured as the ratio of net income to total assets. BM: Book value of equity divided by market value of equity.

*Note: *** p<0.01, ** p <0.05, *p<0.1*

Change_RISK^{ID}	Coef.	P>t	Coef.	P>t
Change_DD	0.552***	0.000		
Change_ABACC^2			2.613***	0.000
BSIZE	0.002	0.224	0.002	0.305
STATE	-0.000005	0.733	-0.00001	0.652
DUA	0.001	0.467	0.00043	0.544
CEO	-0.00001	0.900	0.00001	0.881
SIZE	-0.0002	0.400	-0.00017	0.539
LEV	-0.001	0.770	-0.00006	0.978
RET	0.001	0.174	0.001**	0.021
AGE	-0.001*	0.075	0.0002	0.824
ROA	-0.010**	0.026	-0.009**	0.042
BM	0.00002	0.590	0.00002	0.528
CFO_lag1	0.001	0.646	0.002	0.497
CFO_lead1	-0.001	0.807	-0.001	0.787
CFO	0.003	0.105	0.003*	0.099
Industry dummies	Yes	Yes	Yes	Yes
F-stat	2.48***		1.74*	
Adj. R^2	0.050		0.03	

Table 8: 2SLS regression using board size and state ownership as instrumental variables
$RISK^{ID}$ refers firm idiosyncratic volatility. DD and $ABACC^2$ are two proxies of financial reporting quality. CFO is the operating cash flows scaled by average total assets. BSIZE* is estimated in the first stage using board size industry average as an instrumental variable. STATE* is estimated in the first stage using state ownership industry average as an instrumental variable. CFO_lag1 is the operating cash flows year scaled by average total assets in the previous year, and CFO_lead1 is the operating cash flows scaled by average total assets in the following year. BSIZE is the board size, measured as the natural logarithm of the number of board members. SIZE is the natural logarithm of total assets. LEV is the firm's financial leverage computed as the ratio of total debt to total assets. RET refers to annual buy-and-hold return. AGE is computed as the natural logarithm of number of years since listing in HOSE. ROA is the return on assets, measured as the ratio of net income to total assets. BM: Book value of equity divided by market value of equity.

$RISK^{ID}$	Coef.	P>z	Coef.	P>z
DD	0.543***	0.002		
ABACC2			1.935*	0.050
BSIZE*	0.003*	0.061	0.003*	0.072
STATE*	-0.00004***	0.001	-0.00004***	0.000
SIZE	-0.001***	0.000	-0.001***	0.000
LEV	0.0005	0.786	0.001	0.733
RET	0.002***	0.001	0.002***	0.001
AGE	-0.002	0.015	-0.002**	0.014
ROA	-0.020***	0.000	-0.020***	0.000
BM	0.00004	0.154	0.00005	0.132
CFO_lag1	-0.002	0.457	-0.001	0.509
CFO_lead1	-0.002	0.273	-0.002	0.27
CFO	-0.002	0.271	-0.002	0.296
_cons	0.052***	0.000	0.055***	0.000
Industry dummies	Yes	Yes	Yes	Yes
Wald Chi^2	149.16***		142.2***	
R^2	0.198		0.190	

*Note: *** p<0.01, ** p <0.05, *p<0.1*

5. Conclusion

Our study sheds more lights on idiosyncratic risk determinants by providing empirical evidence of significant relationships between financial reporting quality, corporate governance characteristics, and firm idiosyncratic risk in a new frontier market: Vietnam. Utilizing multiple econometric techniques of panel data analysis, we find that financial reporting quality is negatively linked with idiosyncratic risk, suggesting that firms that disclose more relevant and reflective information tend to reduce firm specific risk. State ownership is also found to negatively influence firm idiosyncratic risk which can be explained by better monitoring by the State and the low risk-taking incentives of managers given financial and political supports from the government (Vo, 2018). On the other hand, board size is found to be positively related to firm specific risk. These findings highlight the role of high-quality financial reporting framework and better corporate governance mechanism in managing firm-specific risk. This is highly applicable for emerging or frontier markets as these markets tend to have weak regulatory framework and governance system. State ownership is particularly relevant for transitional

economies in which many firms are owned by the government. Given our significant contributions, there are some limitations that need to be acknowledged. First, firm-level corporate governance variables are not widely available for Vietnamese firms, which limits our sample. As a result, we examine some key corporate governance characteristics that are most relevant to idiosyncratic risk. Further studies can extend our research to include different corporate governance variables, proxies for financial reporting quality as well as idiosyncratic risk. Future research can also use a longer period of time, compare the results under different market conditions, or conduct cross-market studies.

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