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CORPORATE DIVERSIFICATION AND CRASH RISK: EVIDENCE IN EAST ASIAN FIRMS

Edwin Hendra
Management Department, Faculty of Economics and Business, Universitas Indonesia, Depok, Indonesia

Cynthia Afriani Utama
Management Department, Faculty of Economics and Business, Universitas Indonesia, Depok, Indonesia

Arief Wibisono Lubis
Management Department, Faculty of Economics and Business, Universitas Indonesia, Depok, Indonesia

Sung Suk Kim
Management Department, Faculty of Economics and Business, Universitas Indonesia, Depok, Indonesia

ABSTRACT

This study examines the impact of corporate diversification on crash risk in East Asian firms. We selected East Asian firms as the research sample due to unique features that might facilitate agency problems there, such as lower investor protection, more concentrated ownership among firms, and less developed institutional contexts in emerging economies. This study proposes two competing effects explaining the mechanisms of how diversification exacerbates or mitigates crash risk among East Asian firms: information complexity and diversification capacity effects. This study employs a pooled ordinary least-square (OLS) regression on a sample of publicly listed firms in six East Asian countries from 2014 to 2019. Consistent with the diversification capacity effect, our results show that diversification mitigates crash risk among East Asian firms.

Keywords: crash risk; corporate diversification

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INTRODUCTION

Crash risk, the likelihood of highly negative firm-specific abnormal returns, has received considerable attention from practitioners and academicians in the last decade. Investors have lost tremendous wealth following events such as

Black Monday in 1987, the burst of the dot-com bubble in 2001, the 2008 financial crisis, and corporate scandals such as the cases of Xerox, WorldCom, and Enron. Therefore, scholars are increasingly interested in exploring various determinants of crash risk (Habib et al., 2018). Frequent firm-specific stock price crashes have at least two consequences. First, significant losses in paper wealth might erode investors' confidence (Merton, 1987), causing difficulty for managers in raising equity financing (Jensen, 2004, 2005). Second, investors might regard crash risk as a significant-priced factor: investors demand higher expected returns to compensate for the downside risk of negative skewness (Conrad et al., 2013). Investors would be more averse to buying stocks that have historically crashed. Therefore, managers must consider crash risk as an important factor, avoiding decisions that might cause stock prices to plunge in the future.

Many studies have been conducted to answer the diversification discount (premium) puzzle—why diversified firms have relatively lower (higher) values than collective-focused firms (Berger & Ofek, 1995; Lang & Stulz, 1994; Lins & Servaes, 2002). The most venerable explanation of the diversification discount is due to internal capital market inefficiency (Rajan et al., 2000) and agency problems (Denis et al., 1997; Hoechle et al., 2012). Meanwhile, the crash risk literature offers an alternative performance measure that reflects agency problems (Jin & Myers, 2006). However, only a few studies have examined the relationship between diversification and crash risk, which also have provided mixed conclusions (Lee et al., 2019; Qi & Diao, 2020; Wang et al., 2023). Environmental heterogeneity across the country exacerbates bad news-hoarding behavior, such as less developed financial and poor corporate governance systems, and positively affects crash risk (Jin & Myers, 2006).

This study examines the relationship between corporate diversification and crash risk in a cross-country context, filling the above research gap. First, this study focuses on explaining the impact of diversification on firm performance according to the agency theory perspective. Second, it reaffirms the mixed conclusion in prior studies regarding the relationship between diversification and crash risk. Third, it extends the analysis to a cross-country context, which has not been explored in the extant studies to the best of our knowledge.

To this extent, the study selects six East Asian countries (Indonesia, Hong Kong, Malaysia, Taiwan, Singapore, and South Korea) as the research context due to their unique features. First, in comparison to developed countries, East Asian countries have lower investor protection, leading to more concentrated ownership among firms since controlling shareholders are discouraged from issuing stock to the public; meanwhile, minority shareholders face an adverse selection problem when purchasing stock due to fear of expropriation (La Porta et al., 1998). Second, Type II agency problems (Shleifer & Vishny, 1986) are prevalent among East Asian countries, mainly when the largest shareholder's control rights exceed cash-flow ownership (Claessens et al., 2000, 2002). Third, institutional contexts, such as production factors (capital, labor, and product), markets, financial institutions, and the financial press, might be either less developed, poorly functioning, or nonexistent in emerging countries (Khanna & Palepu, 1997). Fourth, East Asian countries might exhibit higher stock price synchronicity (R-squared) that is positively correlated to crash risk (Jin & Myers, 2006) due to poorer corporate governance and less developed financial systems (Morck et al., 2000).

The context of East Asian countries, therefore, provides a unique setting where diversification commonly might harm or benefit minority shareholders, exacerbating or mitigating Type II agency problems. On the one hand, entrenched insiders might utilize diversification to expropriate minority shareholders to the extent that a lower valuation of diversified firms indicates the presence of "crony capitalism" (Lins & Servaes, 2002). Hence, the information complexity (entrenchment) effect suggests that entrenched insiders abuse diversified companies' higher information asymmetry (opacity) (Burch & Nanda, 2003; Krishnaswami & Subramaniam, 1999) to conceal bad news from outside investors that eventually causes a stock price crash (Jin & Myers, 2006). On the other hand, in emerging countries, diversification might replace external market functions by creating more efficient internal capital markets (Khanna & Palepu, 1997, 2000b), reducing transaction costs. Thus, the diversification capacity (incentive) effect posits that

diversification can combat bad news hoarding due to the diversifying capacity of multiple segments (Hendricks et al., 2009; Hendricks & Singhal, 1997; Wood et al., 2017), more scrutinized monitoring of debt holders (Krishnaswami et al., 1999; Lewellen, 1971; Ross, 1977), and lower opacity (earnings management accruals) (El Mehdi & Seboui, 2011; Jiraporn et al., 2008; Thomas, 2002).

This paper contributes to the literature in three aspects. First, the study extends Claessens et al. (1998), Claessens et al. (1999), and Lins and Servaes (2002) by investigating the influence of diversification on crash risk in addition to its impact on firm performance in East Asian countries. Second, it corroborates the evidence regarding the relationship between diversification and crash risk, which contradicts prior studies focusing on Malaysia (Lee et al., 2019), China (Qi & Diao, 2020), and the U.S. (Wang et al., 2023). Third, it utilizes a more extensive data set of six East Asian countries to examine the relationship between diversification and crash risk. And finally, in addition to prior studies (Lee et al., 2019; Qi & Diao, 2020; Wang et al., 2023), it explores an alternative hypothesis and mechanisms explaining a relationship that is more suitable for the context of East Asian countries.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Crash Risk Determinants

The extant literature on crash risk has examined various determinants of crash risk, classifying them into five categories: (1) financial reporting and disclosure, (2) managerial characteristics, (3) capital market transactions, (4) informal institutional mechanisms, and (5) corporate governance mechanisms (Habib et al., 2018). Jin and Myers (2006) were among the earliest to study financial reporting-related determinants of crash risk. They found that higher stock-crash frequencies and stock-price synchronicity (R-squared) appear in more opaque countries. Hutton et al. (2009) showed that firms with stronger earnings management practices (more opaque) have higher stock-crash frequencies and stock-price synchronicity and are more inclined toward crash risk. Concerning managers' characteristics, firms managed by female CEOs exhibit lower crash risk (Li & Zeng, 2019), while firms managed by more powerful CEOs have higher crash risk (Al Mamun et al., 2020). A higher likelihood of crash risk is also positively related to trading volume (Chen et al., 2001) and stock liquidity (Chang et al., 2017). Crash risk studies concerning informal institutional mechanisms are extensively discussed in China. Piotroski et al. (2015) revealed that stock-price crashes are lower during political events but higher in the post-event years. Li and Chan (2016) found that state-owned enterprises where Communist Party of China committee members serve as directors have lower stock-price crash risk. Hu and Wang (2018) demonstrated that corporate political connections can mitigate crash risk. Jebran, Chen, and Zhu (2019) found that the degree of informality among directors can exacerbate crash risk. According to F. Li and Jiang (2022), a positive association between institutional investor networks and crash risk exists. Jebran et al. (2022) discovered a positive (negative) relationship between internal (external) board social capital and crash risk. Finally, S. Chen et al. (2022) showed that firms in regions with stronger tax enforcement exhibit lower crash risk. In terms of the extent of the determinants of corporate governance mechanisms, Andreou et al. (2016) noted that CEO's stock option incentives, transient institutional ownership, and outside directors' shareholdings exacerbate crash risk, while accounting conservatism, insider shareholding, board size, and companies' mandates of formal corporate governance policy alleviate crash risk. Jebran et al. (2020) showed that greater board diversity can mitigate crash risk.

Corporate Diversification and Crash Risk

Under the framework of bad news hoarding (L. Jin & Myers, 2006), we propose two competing effects explaining the relationship between diversification and crash risk among East Asian firms. First, the information-complexity (entrenchment) effect posits that diversification facilitates entrenched insiders to conceal bad news from minority shareholders, consequently causing a stock price crash. Thomas (2002) argued that diversified firms possess a higher information asymmetry due to a more complex organizational structure. Hence, diversified firms conduct several mechanisms to alleviate information asymmetry, such as corporate spinoffs (Burch & Nanda, 2003; Krishnaswami & Subramaniam, 1999), a more sound corporate

governance system (Bushman et al., 2004), the use of debt financing (Rodríguez-Pérez & van Hemmen, 2010), and higher-quality segment disclosure (Franco et al., 2016). In the context of East Asian countries, Type II Agency Problems (conflicts between majority and minority shareholders) (Shleifer & Vishny, 1986) are more prevalent due to the presence of large shareholders, particularly those with excess control rights over cash flow rights (Claessens et al., 2002). A more significant information asymmetry and market imperfection among emerging markets enable tunneling practices via diversification (Johnson et al., 2000), where entrenched insiders expropriate minority shareholders by transferring capital elsewhere in favor of the majority shareholders (Lins & Servaes, 2002), causing a shortage of cash flow available to minority shareholders and poor firm performance. To this extent, the information complexity effect predicts that diversification positively affects crash risk.

Second, the diversification capacity (incentive) effect posits that diversified firm managers are less likely to hoard bad news due to the beneficial capacities of owning multiple business segments. The internal capital market mechanism enables diversified firms to cover significant losses of one business segment (Gertner et al., 1994); hence, negative events have little economic impact on the overall firm's value (Hendricks et al., 2009; Hendricks & Singhal, 1997; Wood et al., 2017). Diversified firms are more leveraged (Jouida, 2018) due to lower cash flow volatility (Lewellen, 1971); therefore, they are closely scrutinized by debtholders (Krishnaswami et al., 1999; Ross, 1977). Diversified firms possess lower opacity (accruals earnings management) since the business segments' accruals offset each other (El Mehdi & Seboui, 2011; Jiraporn et al., 2008). The arguments above support the notion that diversification deters corporate insiders from bad news hoarding activities, reducing the likelihood of crash risk. To this extent, the diversification capacity effect predicts that diversification negatively affects crash risk.

Taking all of these arguments, we propose the hypothesis:

Hypothesis 1: Diversification affects crash risk among East Asian firms.

METHODOLOGY

Sample and Data

The population of this study is publicly listed firms from emerging countries in East Asia, but limited to countries used by both Claessens et al. (2002) and Lins and Servaes (2002): Indonesia, Hong Kong, Malaysia, Taiwan, Singapore, and South Korea. In addition, we excluded observations with no sales report by segment, segments operating in the financial services industry (having segments with NAICS codes between 520000 and 529999), less than twenty-six weeks of stock-return data in a fiscal year, inadequate financial data to measure control variables, and with negative book equity. Finally, we collected stock price and financial reports data from Thomson Reuters Eikon and S&P Capital IQ databases from 2014 to 2019. This process resulted in a final sample of 16,488 firm-year observations, as in Table 1.

Table 1: Sample

Descriptions	Total	%
Initial observation (firm-year)	34,050	100.00
Less:		
Observations with no sales report by segment	5,842	17.16
Observations with segments operating in the financial service industry	2,516	7.39
Observations with less than twenty-six weeks of stock-return data in a fiscal year	3,064	9.00
Observations with inadequate financial data to measure control variables and a negative book value of equity	6,140	18.03
Final Observation	16,488	48.42

Source: Developed by the authors.

Variable Measurements

Dependent Variable: Crash Risk

This study has calculated crash risk measures in two steps. In the first step, for each firm-year observation, we have conducted a time series regression of the weekly stock return ($r_{i,t}$) and

the weekly market return ($r_{m,t}$) to obtain the regression residual (the firm-specific weekly abnormal return) ($\varepsilon_{i,t}$) with the expanded market model in Equation (1).

$$r_{i,t} = \alpha_i + \beta_1 r_{m,t-1} + \beta_2 r_{i,t-1} + \beta_3 r_{m,t} + \beta_4 r_{m,t+1} + \beta_5 r_{i,t+1} + \varepsilon_{i,t} \quad (1)$$

The lead and lag terms have been included in the model to address non-synchronous trading (Dimson, 1979). Next, the firm-specific weekly abnormal return has been converted from a continuous form ($\varepsilon_{i,t}$) into an arithmetic form ($w_{i,t}$) using Equation (2).

$$w_{i,t} = \ln(1 + \varepsilon_{i,t}) \quad (2)$$

In the second step, we have used the firm-specific weekly abnormal return ($w_{i,t}$) as the primary input for three crash risk measures for each firm-year observation.

Crash risk has been proxied using three alternative measures. We have calculated the first measure, the negative skewness coefficient (NCSKEW), with Equation (3), where n is the number of firm-specific weekly abnormal returns ($w_{i,t}$) in a fiscal year (J. Chen et al., 2001; Qi & Diao, 2020).

$$NCSKEW_i = -\left[n(n-1)^{\frac{3}{2}} \sum w_{i,t}^3\right] \div \left[(n-1)(n-2)\left(\sum w_{i,t}^2\right)^{\frac{3}{2}}\right] \quad (3)$$

The second measure, down-to-up volatility (DUVOL), has been calculated with Equation (4). This measure separates "down" weeks from "up" weeks, where a down (up) week is the firm-specific abnormal weekly return lower (higher) than the annual average weekly return in fiscal year t; hence, n_d is the number of down weeks and n_u Is the number of up weeks (J. Chen et al., 2001; Qi & Diao, 2020).

$$DUVOL_i = \ln\left\{\frac{1}{(n_d - 1)} \sum_{Down} w_{i,t}^2 \div \frac{1}{(n_u - 1)} \sum_{Up} w_{i,t}^2\right\} \quad (4)$$

Finally, the third measure, frequency of crash weeks (FREQ), is the number of firm-specific weekly abnormal returns ($w_{i,t}$) that falls over two standard deviations below its mean value ($\overline{w_{i,t}}$) in fiscal year t (Luo & Zhang, 2020).

Independent Variable: Corporate Diversification

This study has proxied corporate diversification with three alternative measures for each firm-year observation. The first measure, diversified firm indicator (DIV), is a dummy variable that gives "1" if a firm has two or more business segments having different two-digit NAICS (North American Industry Classification System) codes, and each segment's sales account for less than 90% of total sales, or "0" otherwise, as described in Equation (5) (Lins & Servaes, 2002).

$$DIV_i = \begin{cases} 1 \; if \; the \; firm \; i \; has \; two \; or \; more \; reported \; segments \\ 0 \; otherwise \end{cases} \quad (5)$$

The second measure, number of segments (SEG), is the firm's number of reported segments with different two-digit NAICS codes in which each segment's sales account for less than 90% of total sales (Denis et al., 1997). Finally, the third measure, diversification degree (RHI), has been calculated with Equation (6), representing the reverse segment sales-based Herfindahl-Hirschman Index ratio (Denis et al., 1997).

$$RHI_i = 1 - \left[\sum_{j=1}^{n} Segment\ Sales_j{}^2 \div \left(\sum_{j=1}^{n} Segment\ Sales_j\right)^2\right] \quad (6)$$

Control Variables

We have followed Srinidhi and Liao (2020) in including control variables. The control variables are share turnover (TURN), stock return volatility (SIGMA), yearly abnormal return (WRET), information discreteness (ID), financial report opacity (OPAQUE), firm size (SIZE), leverage (LEV), market-to-book value (MTB), return-on-assets (ROA), financial system (FINSYS), disclosure requirements index (DISCREQ), anti-director rights score (ADRIGHT), the importance of equity market score (IEM), inflation (INF), and Gross Domestic Product per capita (GDPCAP). Table 2 presents details for all variables.

Table 2: Variables

Variable Type	Variable Name	Symbol	Description
Dependent variables	Negative skewness coefficient	NCSKEW	The negative value of skewness of the firm-specific weekly abnormal return distribution (J. Chen et al., 2001).
	Down-to-up volatility	DUVOL	The natural logarithmic ratio of the standard deviation during the up weeks to the standard deviation during the down weeks (J. Chen et al., 2001).
	Frequency of crash weeks	FREQ	The number of firm-specific weekly abnormal returns that fall more than two standard deviations below their mean value in a given year (Luo & Zhang, 2020).
Independent variables	Diversified firms indicator	DIV	The dummy variable equals 1 if a firm is classified as diversified and 0 otherwise (Lins & Servaes, 2002).
	Number of segments	SEG	The firm's number of reported segments has different two-digit NAICS codes in which each segment's sales account for less than 90% of total sales (Denis et al., 1997).
	Diversification degree	RHI	The reverse segment sales-based Herfindahl-Hirschman Index ratio (Denis et al., 1997).
Control variables	Share turnover	TURN	Average monthly trading volume/number of shares outstanding.
	Stock return volatility	SIGMA	The standard deviation of firm-specific weekly abnormal return.
	Yearly Abnormal Return	WRET	The average firm-specific abnormal weekly returns times one hundred.
	Information discreteness	ID	Da et al.'s (2014) information discreteness measure.
	Financial report opacity	OPAQUE	The sum of the past three years' annual discretionary accruals' absolute values (Hutton et al., 2009).
	Firm size	SIZE	Natural log of total assets.
	Leverage	LEV	Total debt/total assets.
	Market-to-book value	MTB	Market capitalization/total equity.
	Return-on-assets	ROA	Net income/total assets.
	Financial system	FINSYS	The dummy variable equals 1 for a market-based country and 0 for a bank-based country (Maksimovic & Demirgüc-Kunt, 2002).
	Disclosure requirements index	DISCREQ	The disclosure requirements index of one country (La Porta et al., 2006).

Table 2: Continued

	Anti-director rights score	ADRIGHT	The anti-director rights score of one country (La Porta et al., 1998).
	Importance of equity market score	IEM	The importance of the equity market score of one country (Leuz et al., 2003).
	Inflation	INF	The inflation of one country in a fiscal year.
	Gross Domestic Product per capita	GDPCAP	Natural log of the GDP of one country in a fiscal year.

Source: Developed by the authors.

Empirical Model

We conducted panel OLS regression using the pooled model in Equation (7) to test Hypothesis 1, according to the research model in Figure 1. As the robustness check, we also employed panel regression with random and fixed effect models, the Fama-MacBeth regression, and the two-step dynamic panel GMM regression.

$$CrashRisk_{i,t} = \beta_0 + \beta_1 Diversification_{i,t-1} + \sum \beta_k Control_{i,t-1} + \varepsilon_{i,t} \quad (7)$$

This model has employed crash risk as the dependent variable and diversification as the primary independent variable in this model, with i and t used to indicate firms and years, respectively. $CrashRisk_{i,t}$ represents crash risk with three alternative measures: negative skewness coefficient ($NCSKEW$), down-to-up volatility ($DUVOL$), and frequency of crash weeks ($FREQ$) of firm i in the year t. $Diversification_{i,t-1}$ represents past corporate diversification with three alternative measures: diversified firm indicator (DIV), number of segments (SEG), and diversification degree (RHI). Following prior studies (J. Chen et al., 2001; Choi & Park, 2022), we have included lagged crash risk ($CrashRisk_{i,t-1}$) as a control variable to accommodate the property of conditional skewness (Harvey & Siddique, 1999). In addition, we have employed the past value of control variables in the regression model. Finally, $\varepsilon_{i,t}$ represents the error term.

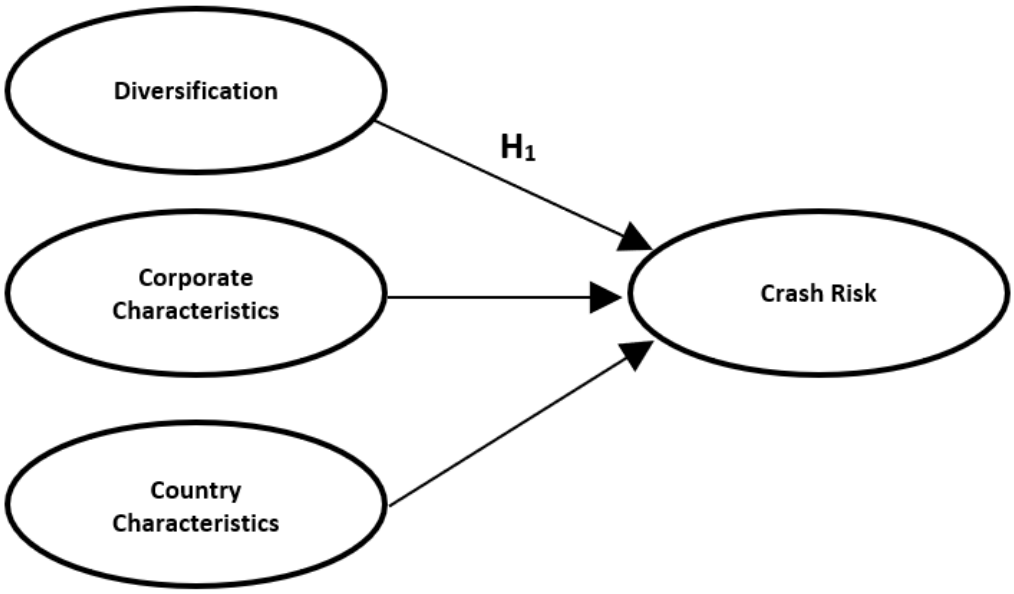

Figure 1: The Research Model

Source: Developed by the authors.

RESULTS

Descriptive Statistics

Table 3 summarizes the descriptive statistics of all variables. The average negative skewness coefficient of six East Asian countries (-0.093) is higher than those of Lee et al. (2019), Qi and Diao (2020), and Choi and Park (2022), who used samples from Malaysia (-0.302), China (-0.256), and South Korea (-0.328), but lower than those of Srinidhi and Liao (2020), who examined crash risk in the U.S. (0.036). Although Jin and Myers (2006) argued that higher crash risk among countries is associated with poorer corporate governance systems and less developed financial systems, our numbers do not correspond to the country's control variables: disclosure requirements, anti-director rights, financial systems, and the importance of the equity market. Our findings also suggest that 28.7% of firms in six East Asian countries are diversified. This number differs slightly from Lins and Servaes (2002), who found that 29.0% of these firms were diversified in 1992. Meanwhile, Qi and Diao (2020) and Fuente and Velasco (2020) found a higher percentage of diversified firms in China (41.4%) and the U.S. (36.3%). These numbers do not support Khanna and Palepu's (1997) argument that a diversified strategy is more suitable than a focused (single-segment) strategy for firms in emerging countries. Nevertheless, focused firms in East Asia can still get diversification benefits by affiliating with a diversified business group.

Table 3: Summary statistics

Variables	Obs.	Mean	Median	Std.	Min	Max
NCSKEW	16,488	-0.093	-0.125	0.865	-2.308	3.089
DUVOL	16,484	-0.064	-0.079	0.565	-1.411	1.638
FREQ	16,488	1.117	1.000	0.815	0.000	5.000
DIV	16,488	0.287	0.000	0.453	0.000	1.000
SEG	16,488	1.470	1.000	0.867	1.000	8.000
RHI	16,488	0.128	0.000	0.192	0.000	0.777
TURN	16,488	0.126	0.035	0.249	0.000	1.605
SIGMA	16,488	0.051	0.045	0.027	0.012	0.157
WRET	16,488	-0.161	-0.098	0.194	-1.182	-0.007
ID	16,488	-0.095	-0.096	0.120	-0.392	0.176
OPAQUE	16,488	0.820	0.641	0.669	0.055	3.763
SIZE	16,488	19.231	18.987	1.645	15.937	23.939
LEV	16,488	0.416	0.411	0.203	0.040	0.895
MTB	16,488	2.055	3.948	0.962	0.000	29.139
ROA	16,488	0.014	0.026	0.107	-0.498	0.267
FINSYS	16,488	0.799	1.000	0.401	0.000	1.000
DISCREQ	16,488	81.718	75.000	13.713	50.000	100.000
ADRIGHT	16,488	3.318	3.000	1.223	2.000	5.000
IEM	16,488	19.014	13.300	8.800	4.700	28.800
INF	16,488	0.019	0.015	0.014	-0.006	0.084
GDPCAP	16,488	10.053	10.291	0.798	8.076	11.020

Note: The NCSKEW, DUVOL, TURN, SIGMA, WRET, ID, OPAQUE, SIZE, LEV, MTB, and ROA data have been winsorized at the 1% level to reduce the effect of outliers.

Source: Developed by the authors using STATA 17.

Regression Analysis

Table 4 presents the pooled OLS regression results of the impact of diversification on crash risk while controlling for the firm's and country's characteristics variables. The dependent variable is crash risk measured by *NCSKEW* in columns (1), (2), and (3); *DUVOL* in columns (4), (5), and (6); and *FREQ* in columns (7), (8), and (9). The primary independent variable is diversification, measured by *DIV* in columns (1), (4), and (7);

SEG in columns (2), (5), and (8); and *RHI* in columns (3), (6), and (9). Except in columns (1), (3), and (7), coefficients of alternative measures of diversification are negatively significant in the 5% level (two-tailed). Hence, these results indicate that corporate diversification negatively influences crash risk among East Asian firms, supporting the diversification capacity effect in Hypothesis 1. This result is also robust in alternative estimation methods to address endogeneity issues: the panel regression with random and fixed effect models, the Fama-MacBeth regression, and the two-step dynamic panel GMM regression. However, for brevity, the results are not reported in this paper and are available upon request.

DISCUSSION

The negative coefficient of diversification suggests that industrial diversification can mitigate crash risk in East Asian countries. The weaker explanatory power of the diversified firms indicator and the negative skewness coefficient show they are less robust alternative measures than the others. Nevertheless, negative signs on all nine regression coefficients indicate that our result is consistent and robust.

The negative relationship between diversification and crash risk indicates that diversification in East Asian countries is commonly driven by the transaction-cost reduction motive (Matsusaka & Nanda, 2002) rather than the expropriation (agency) motive (Lins & Servaes, 2002). Therefore, this finding supports Khanna and Palepu (1997, 2000a), who argued that a diversified structure is more suitable for firms in emerging countries with less developed institutional contexts. Besides, Kim et al. (2014) posited that diversification can provide a hedging mechanism to reduce the wealth portfolio risk of large shareholders, whose presence is common among East Asian firms (Claessens et al., 2000). Our result also aligns with Jiraporn et al. (2008) and El Mehdi and Seboui (2011), who found a negative impact of industrial diversification on accrual earnings management, which represents financial report opacity (Hutton et al., 2009).

Corporate diversification can mitigate crash risk since diversified firms possess mechanisms that might prevent bad news hoarding. First, diversified firms have a higher capacity to absorb losses than focused firms; hence, managers are less likely to conceal bad news since they believe that negative events will have little impact on the stock price. Prior studies have shown that announcements regarding delays in new product introduction (Hendricks & Singhal, 1997), operational slack (Hendricks et al., 2009), and product recall (Wood et al., 2017) have a less negative stock market reaction among diversified firms. Second, diversified firms might have higher leverage (Jouida, 2018) since the cash flows among business segments are imperfectly correlated (Lewellen, 1971), increasing the involvement of the debtholders in monitoring the actions of managers (Krishnaswami et al., 1999; Ross, 1977). Third, diversified firms exhibit lower opacity—the bad news hoarding vehicle (Hutton et al., 2009; Jin & Myers, 2006). Thomas (2002) argued that diversified firms have lower asymmetric information since the analysts' forecast errors regarding business segments' cash flow might cancel out each other. Consequently, Jiraporn et al. (2008) and El Mehdi and Seboui (2011) suggested that business segment accruals could also offset each other, lowering the overall earnings management (opacity) at the firm level.

Finally, this study confirms Q. Wang et al. (2023) and Lee et al. (2019), who also found a negative association between diversification and crash risk in the U.S. and Malaysia. However, our finding contradicts Qi and Diao (2020), who found a higher crash risk among diversified firms in China. We suggest that these results are due to differences in common ownership structure among these countries. Many listed firms in China are state-owned-enterprises with higher agency problems complexity and information asymmetry due to concentrated ownership of the government, where the firms are managed by bureaucrats rather than professional managers (Lin et al., 2020; Zhang, 2006); thereby, diversification among these firms can exacerbate bad news hoarding.

CONCLUSION AND RECOMMENDATION

This study has examined the impact of corporate diversification on crash risk among East Asian firms. Our findings show a negative correlation between diversification and crash risk, supporting the diversification capacity effect.

We realize this study has limitations that can be explored in future studies. First, this study

focuses on industrial diversification (conglomeration). To this extent, future studies can explore corporate diversification in terms of geographic diversification within the domestic region, global (international) diversification across country borders, or business-group diversification. Second, future studies can also control the divergence between control and cash flow rights.

This study gives practical insights to investors and managers. The benefit of industrial diversification to firm value remains a puzzle due to many factors, such as timeliness, economic conditions, and corporate governance systems. Meanwhile, we shed light on the additional merit of diversification: the crash-risk-mitigating effect. Notably, in the context of East Asian countries, this study corroborates the argument that the diversified structure is more suitable than the focused structure for emerging markets. Given the advantages of diversification, corporate managers in East Asian countries may consider diversifying the current company when expanding business in a new industry rather than establishing a new venture. This study encourages investors to purchase stocks of diversified companies. In addition to diversifying at the portfolio level, investing in diversified firms may hedge the investment risk, incrementally lowering the negative skewness of the portfolio.

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Table 4: Empirical results for Hypothesis 1

	Dependent variable =								
	$NCKSEW_t$			**$DUVOL_t$**			**$FREQ_t$**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DIV_{t-1}	**-0.028***			**-0.021****			**-0.023**		
	(-1.800)			**(-2.080)**			**(-1.620)**		
SEG_{t-1}		**-0.018****			**-0.011****			**-0.021*****	
		(-2.240)			**(-1.960)**			**(-2.660)**	
RHI_{t-1}			**-0.060***			**-0.047****			**-0.080****
			(-1.640)			**(-1.980)**			**(-2.310)**
$NCSKEW_{t-1}$	0.011	0.010	0.011						
	(1.180)	(1.170)	(1.190)						
$DUVOL_{t-1}$				0.029***	0.029***	0.029***			
				(3.340)	(3.330)	(3.350)			
$FREQ_{t-1}$							0.026***	0.026***	0.026***
							(3.180)	(3.170)	(3.180)
$TURN_{t-1}$	0.156***	0.156***	0.156***	0.097***	0.097***	0.097***	0.124***	0.124***	0.124***
	(4.180)	(4.190)	(4.190)	(4.370)	(4.380)	(4.380)	(4.440)	(4.460)	(4.460)
$SIGMA_{t-1}$	-1.678*	-1.693*	-1.683*	-1.062*	-1.070*	-1.066*	-3.101***	-3.122***	-3.111***
	(-1.790)	(-1.810)	(-1.800)	(-1.770)	(-1.780)	(-1.770)	(-4.000)	(-4.030)	(-4.010)
$WRET_{t-1}$	-0.372***	-0.374***	-0.373***	-0.253***	-0.254***	-0.254***	-0.407***	-0.410***	-0.409***
	(-2.840)	(-2.860)	(-2.840)	(-3.000)	(-3.010)	(-3.010)	(-3.870)	(-3.900)	(-3.890)
ID_{t-1}	0.216***	0.217***	0.216***	0.138***	0.139***	0.138***	0.058	0.060	0.058
	(3.70)	(3.720)	(3.700)	(3.660)	(3.680)	(3.660)	(1.090)	(1.120)	(1.090)
$OPAQUE_{t-1}$	0.010	0.010	0.010	0.008	0.008	0.008	0.001	0.000	0.000
	(0.940)	(0.910)	(0.940)	(1.070)	(1.080)	(1.070)	(0.080)	(0.010)	(0.020)
$SIZE_{t-1}$	0.025***	0.026***	0.025***	0.013***	0.014***	0.013***	0.008	0.009*	0.008*
	(4.810)	(4.920)	(4.820)	(3.930)	(3.980)	(3.950)	(1.550)	(1.800)	(1.680)
LEV_{t-1}	-0.028	-0.028	-0.029	-0.025	-0.025	-0.025	-0.025	-0.024	-0.025
	(-0.700)	(-0.690)	(-0.710)	(-0.940)	(-0.940)	(-0.950)	(-0.720)	(-0.700)	(-0.710)

Table 4: Continued

MTB_{t-1}	0.012***	0.012***	0.012***	0.007***	0.007***	0.007***	0.006***	0.005***	0.006***
	(5.090)	(5.040)	(5.080)	(4.700)	(4.670)	(4.680)	(2.990)	(2.920)	(2.950)
ROA_{t-1}	0.026	0.024	0.025	0.037	0.037	0.036	0.096	0.092	0.092
	(0.340)	(0.320)	(0.330)	(0.790)	(0.790)	(0.780)	(1.460)	(1.410)	(1.410)
$FINSYS_{t-1}$	-0.243***	-0.242***	-0.243***	-0.162***	-0.162***	-0.162***	-0.017	-0.016	-0.017
	(-6.370)	(-6.330)	(-6.370)	(-6.410)	(-6.380)	(-6.410)	(-0.490)	(-0.450)	(-0.500)
$DISCREQ_{t-1}$	-0.013***	-0.012***	-0.013***	-0.012***	-0.012***	-0.012***	-0.007**	-0.007**	-0.007**
	(-3.440)	(-3.390)	(-3.430)	(-5.150)	(-5.090)	(-5.150)	(-2.070)	(-2.040)	(-2.100)
$ADRIGHT_{t-1}$	-0.289***	-0.288***	-0.289***	-0.238***	-0.236***	-0.238***	0.039	0.039	0.037
	(-6.430)	(-6.420)	(-6.430)	(-7.920)	(-7.890)	(-7.930)	(0.980)	(0.980)	(0.930)
IEM_{t-1}	0.067***	0.067***	0.067***	0.056***	0.056***	0.056***	0.007	0.007	0.007
	(6.440)	(6.420)	(6.430)	(8.060)	(8.020)	(8.070)	(0.700)	(0.700)	(0.760)
INF_{t-1}	1.644**	1.638**	1.647**	1.088**	1.084**	1.090**	1.761***	1.755**	1.766***
	(2.180)	(2.170)	(2.180)	(2.190)	(2.180)	(2.190)	(2.560)	(2.550)	(2.570)
$GDPCAP_{t-1}$	0.009	0.008	0.009	0.016	0.015	0.015	0.030**	0.027**	0.029**
	(0.640)	(0.530)	(0.630)	(1.600)	(1.530)	(1.580)	(2.170)	(1.970)	(2.070)
Constant	0.219	0.225	0.217	0.379**	0.378**	0.377**	1.013***	1.028***	1.022***
	(0.890)	(0.910)	(0.880)	(2.370)	(2.370)	(2.370)	(4.660)	(4.740)	(4.710)
#Firms	4,273	4,273	4,273	4,273	4,273	4,273	4,273	4,273	4,273
#Observations	16,350	16,350	16,350	16,344	16,344	16,344	16,350	16,350	16,350

Note: The t-statistics in parentheses are based on heteroskedastic and serial correlated robust standard errors adjusted for clusters in firms. The signs ***, **, and * indicate significance at 1%, 5%, and 10% levels (two-tailed).

Source: Developed by the authors using STATA 17.

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ABOUT THE AUTHORS:

Edwin Hendra, email: edwin.hendra@gmail.com (Corresponding Author)

Edwin Hendra is a doctoral student at the Faculty of Economics and Business at Universitas Indonesia, majoring in Finance Management. His research interests are Capital Market and Corporate Finance.

Dr. Cynthia Afriani Utama is a Professor at the Faculty of Economics and Business at Universitas Indonesia. Her research interests are Capital Markets, Corporate Finance, and Corporate Governance.

Arief Wibisono Lubis, Ph.D. Vice Dean of Academic, Research, and Student Affairs at the Faculty of Economics and Business, Universitas Indonesia. His research interests are Finance and Human Development.

Dr. Sung Suk Kim is an Associate Professor at the Faculty of Economics and Business at Pelita Harapan University. His research interests are Corporate Governance, Behavioral Finance, Corporate Finance, and Asset Pricing.