

DISAGGREGATING FOREIGN INVESTOR INFLUENCE: DIRECT HOLDINGS, NVDRs, AND STOCK PRICE CRASH RISK IN THE THAI EQUITY MARKET

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ABSTRACT

This study examines the relationship between foreign ownership and stock price crash risk in Thailand's stock market from 2005 to 2024, with a particular focus on distinguishing between direct foreign ownership with voting rights and Non-Voting Depository Receipts (NVDRs) that offer economic exposure without governance power. Using panel data from 275 SET100 firms comprising 3,692 firm-year observations, we employ pooled OLS and firm fixed effects regressions, measuring crash risk via negative skewness (Ncskew) and down-to-up volatility (Duvol). Results reveal that under pooled OLS, NVDR ownership is significantly positively associated with crash risk, while direct foreign ownership shows no significant relationship, supporting the governance rights mechanism. However, these associations disappear under firm fixed effects, suggesting they primarily reflect cross-sectional differences rather than within-firm dynamics. We further investigate whether information asymmetry and stock liquidity moderate these relationships but find no significant moderation effects in either specification, contrasting with findings in other emerging markets. Our findings contribute to the literature by demonstrating that governance rights—not merely foreign presence determine the association between foreign capital and market stability. The results have important implications for policymakers designing capital attraction policies and for investors assessing risk differences between investment channels in emerging markets.

Keywords: Stock Price Crash Risk, NVDRs, Foreign Ownership, Stock Liquidity, Information Asymmetry

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INTRODUCTION

Stock price crash risk is the chance of sudden, sharp drops in stock prices which is a major concern for financial stability in developing markets. The bad-news hoarding idea suggests that managers hide negative information to protect themselves, which builds up over time and causes sudden price drops when the truth finally comes out (Jin & Myers, 2006). Thailand's stock market provides an interesting case for studying crash risk. Foreign investors control much of the trading, but they invest in two different ways: direct ownership with voting rights and Non-Voting Depository Receipts (NVDRs). NVDRs let foreign investors profit from Thai stocks without having any say in company decisions which is a special feature that changes their ability to monitor management. Despite much research on crash risk in other developing markets, Thailand has received little attention. More importantly, existing studies rarely separate foreign ownership by voting rights, even though voting power is key to how well investors can monitor companies. This study fills this gap by examining how direct foreign ownership and NVDR ownership differently affect stock price crash risk in Thailand's top 100 companies from 2005 to 2024. It also tests whether information asymmetry and stock liquidity change these relationships, providing new insights into how voting rights affect the connection between foreign investment and market stability in developing economies.

LITERATURE REVIEWS

Foreign Ownership and Stock Price Crash Risk

Stock price crash risk research builds on Jin and Myers' (2006) bad-news hoarding theory, which argues that managers in opaque firms hide negative information until disclosure becomes unavoidable, causing sharp price drops. Ownership structure plays a key role in either preventing or enabling such behavior. Foreign investors, especially institutional investors are often seen as skilled monitors who improve corporate governance (Ferreira & Matos, 2008). However, in emerging markets, they face information disadvantages and constraints that may reduce their monitoring ability. Recent studies show mixed results. In China, Huang et al. (2020) find that foreign ownership increases crash risk, especially in firms with poor information transparency. Similarly, Vo (2020) reports that foreign ownership raises crash risk in Vietnam due to regulatory ownership limits and information gaps. In India, Shruti and Thenmozhi (2024) show that only stable foreign institutional investment reduces crash risk, while short-term foreign investment increases it. These studies focus on investor type or stability but ignore governance rights. Thailand's NVDR system creates a unique situation where foreign investors can hold economic stakes without voting power. Likitapiwat and Johnson (2016) find that NVDR investors are likely to be informed traders, but trading ability differs from governance influence. No study has examined whether NVDR ownership affects crash risk. Therefore, this study tests the following hypotheses: H1A-C: Foreign ownership—both direct and NVDR—is associated with stock price crash risk, with the effect of NVDR ownership differing from that of direct foreign ownership.

Information Asymmetry as a Moderator

Information asymmetry enables bad-news hoarding. Hutton et al. (2009) show that firms with poor financial transparency experience higher crash risk. Similarly, Kim et al. (2011) demonstrate that tax avoidance facilitates managerial bad-news hoarding, which leads to stock price crashes. Huang et al. (2020) find that foreign ownership increases crash risk more strongly in firms with high price delay, suggesting that information asymmetry amplifies the effect of foreign investors. In Thailand, where disclosure quality varies widely, foreign investors, especially NVDR holders without governance rights may struggle to detect early warning signs of firm-specific problems. Therefore, this study tests the following hypotheses:

H2A-C: Information asymmetry moderates the relationship between foreign ownership (direct and NVDR) and crash risk, with differing effects between the ownership types

Stock Liquidity as a Moderator

Stock liquidity influences stock price crash risk by enhancing governance and price informativeness. High liquidity strengthens the threat of exit, which can discipline managers' disclosure decisions, particularly for investors without control rights such as NVDRs (Edmans, 2009). In emerging markets, however, liquidity interacts with investor behavior: foreign institutional investors in liquid stocks may behave like short-term traders, potentially increasing crash sensitivity (Sezgin Alp et al., 2022). In Thailand, NVDR holders lack voting rights, so in firms with high liquidity, it can partially substitute for internal governance by promoting timely information revelation and external monitoring, thereby mitigating stock price crash risk. Therefore, this study tests the following hypotheses: H3A-C: Stock liquidity moderates the relationship between foreign ownership (direct and NVDR) and crash risk, with differing effects between ownership types.

RESEARCH METHODOLOGY

This study examines the relationship between different types of foreign ownership and stock price crash risk for firms listed in the SET100 Index on the Stock Exchange of Thailand from 2005 to 2024. Data are collected from two primary sources: SETSMART provides firm-level foreign and NVDR ownership data, while Refinitiv Workspace supplies market data, accounting variables, and daily trading information used to construct stock returns, liquidity, and volatility measures. These sources are reliable and accessible, and additional datasets could be incorporated to enhance the study's comprehensiveness. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of extreme outliers that could distort regression results while preserving the data distribution. Following Kim et al. (2011), crash risk is measured using two proxies Ncskew and Duvol computed from firm-specific weekly returns. Firm-specific weekly returns are obtained by regressing individual stock returns on contemporaneous and lagged SET100 Total Return Index returns to remove market-wide effects. The residuals are log-transformed as $W_{i,\tau} = \ln(1 + \varepsilon_{i,\tau})$. Ncskew captures the negative skewness of these returns, with more negative values indicate greater crash risk. Duvol measures the ratio of return volatility during down weeks versus up weeks, with higher values indicating crash-prone stocks. Foreign Ownership represents shares held by investors with voting rights, while NVDR Ownership captures shares held through Non-Voting Depository Receipts. Information asymmetry is proxied using the delay measure ($D1$), and stock liquidity uses the Amihud (2002) illiquidity ratio. The control variable included firm characteristics ($SIZE$, LEV , PB , ROA) to control for fundamentals that may affect both foreign investment decisions and information asymmetry levels. Trading variables ($DTURN$, RET) and volatility measures ($SIGMA$, $STDEV$) capture liquidity, momentum, and information uncertainty. Lagged Ncskew controls for crash risk persistence, ensuring our results isolate the foreign ownership effect. The study employs two specifications. First, following Sezgin Alp et al. (2022), we use pooled OLS regression with industry and year fixed effects. Second, following Shruti and Thenmozhi (2024), we employ firm fixed effects to control for time-invariant firm characteristics. All independent variables are lagged one year, with standard errors clustered at the firm level. Three sets of models test the hypotheses following the equation:

1) Pooled ordinary least squares (OLS) regression equation

$$CrashRisk_{i,t+1} = \alpha + \beta_1 FIO_{i,t} + \beta_2 NVDR_{i,t} + \beta_3 Moderator_{i,t} + \beta_4 (FIO_{i,t} \times Moderator_{i,t}) + \beta_5 (NVDR_{i,t} \times Moderator_{i,t}) + \sum_{n=6}^{14} \beta_n Controls_{i,t} + IndustryFE + YearFE + \varepsilon_{i,t} \quad (1)$$

2) Firm fixed-effects panel regression equation

$$CrashRisk_{i,t+1} = \alpha_i + \beta_1 FIO_{i,t} + \beta_2 NVDR_{i,t} + \beta_3 Moderator_{i,t} + \beta_4 (FIO_{i,t} \times Moderator_{i,t}) + \beta_5 (NVDR_{i,t} \times Moderator_{i,t}) + \sum_{n=6}^{14} \beta_n Controls_{i,t} + \sum_t \gamma_t YearFE + \varepsilon_{i,t} \quad (2)$$

where α represents the constant term in the pooled OLS specification, α_i denotes firm fixed effects, $YearFE$ represents year fixed effects, and $IndustryFE$ represents industry fixed effects in the pooled OLS specification. The firm fixed-effects specification excludes $IndustryFE$ as it is absorbed by firm fixed effects, and $\varepsilon_{i,t}$ is the error term. The baseline model examines direct effects of foreign ownership and NVDR ownership on crash risk. The second model incorporates information asymmetry as a moderating variable through interaction terms with both ownership types. The third model tests liquidity moderation using interactions between the Amihud illiquidity measure and both ownership types.

RESEARCH RESULTS

Table 1 presents descriptive statistics for the main variables. The sample comprises 3,692 firm-year observations from 275 SET100 firms from 2005 to 2024. Foreign ownership ($FIO_{i,t}$) averages 20.0% with substantial variation (SD = 20.3%), while NVDR ownership ($NVDR_{i,t}$) averages 4.4% (SD = 4.5%), indicating non-voting instruments represent a smaller but meaningful component of foreign participation. Crash risk measures show small positive means ($Nc skew_{i,t+1} = 0.064$, $Du vol_{i,t+1} = 0.021$) with considerable variation. Information asymmetry averages 0.329, while illiquidity averages 0.101, reflecting the liquid nature of SET100 stocks. Sample firms are profitable (mean ROA = 5.9%) and moderately leveraged (51.7%).

Table 1: Descriptive statistics.

	N	Mean	Std. Dev.	Min	Max	Median
$Nc skew_{i,t+1}$	3,692	0.064	0.898	-2.141	3.279	-0.006
$Du vol_{i,t+1}$	3,692	0.021	0.568	-1.285	1.677	-0.001
$FIO_{i,t}$	3,692	0.200	0.203	0.000	0.893	0.130
$NVDR_{i,t}$	3,692	0.044	0.045	0.000	0.238	0.028
$InfoAsym_{i,t} (D1_{i,t})$	3,692	0.329	0.261	0.014	0.995	0.255
$ILLIQ_{i,t}$	3,692	0.10143	0.51206	0.00001	4.29528	0.00108
$ROA_{i,t}$	3,692	0.059	0.073	-0.181	0.307	0.053
$PB_{i,t}$	3,692	2.121	2.044	0.250	11.250	1.410
$Logsize_{i,t}$	3,692	16.849	1.648	13.708	21.729	16.637
$Lev_{i,t}$	3,692	0.517	0.213	0.077	0.930	0.525
$Dturn_{i,t}$	3,692	-0.154	2.306	-11.575	9.377	-0.026
$Ret_{i,t}$	3,692	-0.001	0.001	-0.008	0.000	-0.001
$Volatility_{i,t}$	3,692	0.355	0.167	0.105	0.983	0.321
$Sigma_{i,t}$	3,692	0.041	0.020	0.013	0.125	0.037
$Nc skew_{i,t}$	3,692	0.027	0.874	-2.163	3.063	-0.023

Note: $ILLIQ_{i,t}$ is multiplied by 1,000 for readability. In regression models, $Ret_{i,t} (\times 100)$, $PB_{i,t} (\div 100)$, $Logsize_{i,t} (\div 100)$, and $Dturn_{i,t} (\div 100)$ are rescaled.

Tables 2 and 3 present regression results examining the relationship between different types of foreign ownership and stock price crash risk. Table 2 reports pooled OLS regressions with industry and year fixed effects, while Table 3 presents firm fixed effects panel regression. Each table contains three model specifications: baseline effects (Column 1), information asymmetry moderation (Column 2), and liquidity moderation (Column 3). Results are presented for both $Nc skew$ and $Du vol$ crash risk measures.

Table 2 The result of pooled OLS regressions with industry and year fixed effects examining the relationship between different types of foreign ownership and stock price crash risk

Variable	(1)	(2)	(3)	(1)	(2)	(3)
	Pooled OLS			Pooled OLS		
	$Nc skew_{i,t+1}$			$Du vol_{i,t+1}$		
$FIO_{i,t}$	-0.031 (0.103)	-0.011 (0.161)	-0.020 (0.107)	-0.012 (0.061)	-0.014 (0.088)	-0.016 (0.063)
$NVDR_{i,t}$	0.949*** (0.358)	0.974** (0.454)	0.927** (0.369)	0.449** (0.228)	0.714** (0.284)	0.427* (0.231)
$InfoAsym_{i,t}$		0.004 (0.103)			0.038 (0.064)	
$FIO_{i,t} \times InfoAsym_{i,t}$		-0.052 (0.360)			0.008 (0.199)	
$NVDR_{i,t} \times InfoAsym_{i,t}$		-0.108 (1.210)			-0.922 (0.765)	
$ILLIQ_{i,t}$			0.044 (0.062)			0.032 (0.035)
$FIO_{i,t} \times ILLIQ_{i,t}$			-0.076 (0.098)			-0.006 (0.057)
$NVDR_{i,t} \times ILLIQ_{i,t}$			0.306 (0.481)			0.309 (0.384)
$ROA_{i,t}$	1.061*** (0.244)	1.062*** (0.246)	1.077*** (0.244)	0.621*** (0.150)	0.624*** (0.152)	0.650*** (0.150)
$PB_{i,t}$	-0.207 (0.911)	-0.222 (0.923)	-0.174 (0.914)	-0.100 (0.539)	-0.105 (0.542)	-0.071 (0.543)
$Logsize_{i,t}$	-0.057 (1.304)	-0.096 (1.332)	0.167 (1.323)	0.548 (0.806)	0.514 (0.819)	0.790 (0.817)
$Lev_{i,t}$	0.229** (0.092)	0.229** (0.092)	0.224** (0.092)	0.130** (0.059)	0.129** (0.059)	0.126** (0.058)
$Dturn_{i,t}$	-0.373 (0.636)	-0.371 (0.636)	-0.354 (0.636)	-0.524 (0.420)	-0.517 (0.418)	-0.511 (0.420)
$Ret_{i,t}$	-1.039* (0.563)	-1.036* (0.568)	-1.006* (0.567)	-1.083** (0.448)	-1.046** (0.447)	-1.061** (0.448)
$Volatility_{i,t}$	-0.433 (0.367)	-0.455 (0.413)	-0.378 (0.384)	-0.276 (0.212)	-0.285 (0.242)	-0.217 (0.221)
$Sigma_{i,t}$	0.895 (4.355)	1.093 (4.639)	0.605 (4.382)	-1.028 (2.915)	-0.781 (3.108)	-1.389 (2.917)
$Nc skew_{i,t}$	0.046** (0.021)	0.045** (0.021)	0.045** (0.021)	0.028** (0.012)	0.028** (0.012)	0.028** (0.012)
Industry and Year FE	YES	YES	YES	YES	YES	YES
Observations	3,692	3,692	3,692	3,692	3,692	3,692
Hypothesis Tests (H_C):						
H1C	-2.502** (0.012)			-1.892* (0.058)		
H2C		0.041 (0.967)			1.114 (0.265)	
H3C			-0.781 (0.435)			-0.811 (0.417)

*Note: Robust standard errors clustered by firm in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Hypothesis tests: H1C tests $FIO_{i,t} = NVDR_{i,t}$ (Wald test t-statistic and p-value); H2C tests $FIO_{i,t} \times InfoAsym_{i,t} = NVDR_{i,t} \times InfoAsym_{i,t}$; H3C tests $FIO_{i,t} \times ILLIQ_{i,t} = NVDR_{i,t} \times ILLIQ_{i,t}$

Baseline Effects of Different Types of Foreign Ownership (Hypothesis 1)

Column 1 examines the association between ownership structures and crash risk. NVDR ownership demonstrates a strong positive relationship with both measures (coefficient = 0.949, $p < 0.01$ for $Nc skew_{i,t+1}$; 0.449, $p < 0.05$ for $Du vol_{i,t+1}$), supporting H1B. In contrast, direct foreign ownership shows no significant relationship (coefficients = -0.031 and -0.012, both $p > 0.10$), failing to support H1A. The Wald test confirms this difference is statistically significant ($p = 0.012$ for $Nc skew_{i,t+1}$), supporting H1C. This pattern aligns with the

governance rights hypothesis: foreign investors without voting power are associated with elevated crash risk, while those with governance rights show no such association. These findings are consistent with prior emerging market evidence (Huang et al., 2020; Vo, 2020) but extend the literature by demonstrating that only foreign ownership without governance rights exhibits crash risk associations. This supports Jin and Myers' (2006) bad-news hoarding mechanism, where NVDR investors lack formal mechanisms to constrain managerial disclosure behavior, while direct foreign investors with voting rights may exert governance influence.

Information Asymmetry as a Moderator (Hypothesis 2)

Column 2 incorporates information asymmetry and its interactions with ownership types. The information asymmetry coefficient is insignificant (0.004 for $Nc skew_{i,t+1}$, 0.038 for $Du vol_{i,t+1}$, both $p > 0.10$). The interaction terms $FIO_{i,t} \times InfoAsym_{i,t}$ and $NVDR_{i,t} \times InfoAsym_{i,t}$ are also statistically insignificant. Wald tests confirm no significant differences. These findings do not support H2A, H2B, or H2C, indicating that information asymmetry does not moderate the ownership-crash risk relationship. This contrasts with Huang et al. (2020) and may reflect institutional differences between markets or the fact that NVDR investors are likely to possess informational advantages, as suggested by Likitapiwat and Johnson (2016).

Stock Liquidity as a Moderator (Hypothesis 3)

Column 3 examines liquidity moderation. The main illiquidity effect is positive but insignificant (0.044 for $Nc skew_{i,t+1}$, 0.032 for $Du vol_{i,t+1}$, both $p > 0.10$). The interaction terms $FIO_{i,t} \times ILLIQ_{i,t}$ and $NVDR_{i,t} \times ILLIQ_{i,t}$ are both statistically insignificant, with Wald tests showing no significant differences. These results do not support H3A, H3B, or H3C. This differs from Sezgin Alp et al. (2022) and may reflect the dominance of governance rights mechanisms over liquidity conditions.

Control Variables: Several control variables show consistent patterns. ROA is positively and significantly associated with crash risk, suggesting that more profitable firms experience greater crash risk, Leverage shows positive significant effects, consistent with financial constraints increasing crash vulnerability. Lagged Nc skew is positive and significant, indicating persistence in crash risk across years. Average firm-specific weekly returns (Ret) show negative coefficients, suggesting that firms with better past performance face lower subsequent crash risk.

Table 3 The result of Firm Fixed Effects Panel Regression examining the relationship between different types of foreign ownership and stock price crash risk.

Variable	(1)			(2)		
	Firm fixed effect			Firm fixed effect		
	$Nc skew_{i,t+1}$			$Du vol_{i,t+1}$		
$FIO_{i,t}$	-0.159 (0.258)	-0.185 (0.272)	-0.185 (0.269)	-0.034 (0.157)	-0.071 (0.162)	-0.074 (0.161)
$NVDR_{i,t}$	0.905 (0.560)	0.899 (0.688)	0.794 (0.574)	0.550 (0.360)	0.851* (0.464)	0.458 (0.360)
$InfoAsym_{i,t}$		-0.050 (0.103)			0.013 (0.066)	
$FIO_{i,t} \times InfoAsym_{i,t}$		0.080 (0.391)			0.082 (0.216)	
$NVDR_{i,t} \times InfoAsym_{i,t}$		0.031 (1.461)			-0.892 (0.995)	
$ILLIQ_{i,t}$			0.041 (0.062)			0.021 (0.036)
$FIO_{i,t} \times ILLIQ_{i,t}$			-0.019 (0.104)			0.048 (0.059)
$NVDR_{i,t} \times ILLIQ_{i,t}$			0.843 (0.539)			0.669 (0.463)
$ROA_{i,t}$	1.156***	1.166***	1.184***	0.721***	0.724***	0.751***

Variable	(1)	(2)	(3)	(1)	(2)	(3)
	Firm fixed effect			Firm fixed effect		
	<i>Nc skew</i> _{<i>i,t+1</i>}			<i>Du vol</i> _{<i>i,t+1</i>}		
<i>PB</i> _{<i>i,t</i>}	(0.296) 1.454 (1.473)	(0.297) 1.463 (1.482)	(0.298) 1.567 (1.477)	(0.184) 1.266 (0.921)	(0.184) 1.284 (0.925)	(0.184) 1.340 (0.925)
<i>Logsize</i> _{<i>i,t</i>}	7.371 (5.294)	7.206 (5.285)	8.203 (5.336)	4.909 (3.528)	4.844 (3.528)	5.575 (3.592)
<i>Lev</i> _{<i>i,t</i>}	0.082 (0.170)	0.085 (0.169)	0.069 (0.171)	0.058 (0.111)	0.055 (0.110)	0.048 (0.110)
<i>Dturn</i> _{<i>i,t</i>}	-0.159 (0.661)	-0.168 (0.660)	-0.127 (0.662)	-0.465 (0.431)	-0.463 (0.429)	-0.445 (0.432)
<i>Ret</i> _{<i>i,t</i>}	-0.709 (0.588)	-0.719 (0.595)	-0.684 (0.593)	-0.899** (0.436)	-0.882** (0.438)	-0.884** (0.436)
<i>Volatility</i> _{<i>i,t</i>}	-0.953** (0.417)	-1.010** (0.459)	-0.882** (0.431)	-0.623*** (0.238)	-0.649** (0.264)	-0.565** (0.245)
<i>Sigma</i> _{<i>i,t</i>}	4.569 (4.885)	5.048 (5.195)	4.163 (4.883)	0.915 (3.062)	1.199 (3.247)	0.552 (3.049)
<i>Nc skew</i> _{<i>i,t</i>}	-0.053*** (0.019)	-0.054*** (0.019)	-0.054*** (0.019)	-0.029*** (0.011)	-0.029*** (0.011)	-0.030*** (0.011)
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	3,692	3,692	3,692	3,692	3,692	3,692
Hypothesis Tests (H_C):						
H1C	-1.632 (0.102)			-1.453 (0.146)		
H2C		0.030 (0.975)			0.908 (0.363)	
H3C			-1.557 (0.119)			-1.322 (0.185)

*Note: Robust standard errors clustered by firm in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Hypothesis tests: H1C tests $FIO_{i,t} = NVDR_{i,t}$ (Wald test t -statistic and p -value); H2C tests $FIO_{i,t} \times InfoAsym_{i,t} = NVDR_{i,t} \times InfoAsym_{i,t}$; H3C tests $FIO_{i,t} \times ILLIQ_{i,t} = NVDR_{i,t} \times ILLIQ_{i,t}$.

Baseline Effects of Different Types of Foreign Ownership (Hypothesis 1)

Column 1 presents firm fixed effects results controlling for time-invariant characteristics. Neither direct foreign ownership nor NVDR ownership shows significant relationships with crash risk (all $p > 0.10$). Wald tests show no significant differences ($p = 0.102$ for $Nc skew_{i,t+1}$). These results do not support H1A-C under firm fixed effects, suggesting that pooled OLS associations primarily reflect cross-sectional differences rather than within-firm dynamics. This indicates ownership structure functions as a stable firm characteristic rather than a dynamic crash risk driver.

Information Asymmetry as a Moderator (Hypothesis 2)

Column 2 incorporates information asymmetry interactions under firm fixed effects. The standalone information asymmetry coefficient is small and insignificant (-0.050 for $Nc skew_{i,t+1}$, 0.013 for $Du vol_{i,t+1}$, both $p > 0.10$). The interaction terms also lack statistical significance: $FIO_{i,t} \times InfoAsym_{i,t}$ shows 0.080 for $Nc skew_{i,t+1}$ and 0.082 for $Du vol_{i,t+1}$ (both $p > 0.10$), while $NVDR_{i,t} \times InfoAsym_{i,t}$ are 0.031 and -0.892 respectively (both $p > 0.10$). The Wald tests reveal no significant difference between interaction effects ($p = 0.975$ for $Nc skew_{i,t+1}$, $p = 0.363$ for $Du vol_{i,t+1}$). These findings do not support H2A-C under firm fixed effects. The continued absence of moderation effects even when examining within-firm variation reinforces the conclusion that information asymmetry does not condition the ownership-crash risk relationship in the Thai market, contrary to findings in China (Huang et al., 2020). One finding worth noting is that NVDR ownership shows a marginally significant positive effect on $Du vol_{i,t+1}$ (0.851, $p < 0.10$) in this specification, though this effect is not

robust across both crash risk measures and the interaction with information asymmetry remains insignificant.

Stock Liquidity as a Moderator (Hypothesis 3)

Column 3 examines liquidity moderation using firm fixed effects, focusing on how within-firm changes in trading liquidity relate to crash risk. The Amihud illiquidity ratio shows no significant main effect (0.041 for $Nc skew_{i,t+1}$, 0.021 for $Du vol_{i,t+1}$, both $p > 0.10$), suggesting that within-firm changes in stock illiquidity over time are not directly associated with crash risk.

The interaction terms are also statistically insignificant: $FIO_{i,t} \times ILLIQ_{i,t}$ yields -0.019 for $Nc skew_{i,t+1}$ and 0.048 for $Du vol_{i,t+1}$, while $NVDR_{i,t} \times ILLIQ_{i,t}$ shows 0.843 and 0.669 respectively (all $p > 0.10$). This indicates that changes in stock liquidity conditions within firms do not moderate the ownership-crash risk relationship. Wald tests confirm no significant difference between these interaction effects ($p = 0.119$ for $Nc skew_{i,t+1}$, $p = 0.185$ for $Du vol_{i,t+1}$). These results do not support H3A-C in the firm fixed effects framework, consistent with the pooled OLS findings and suggesting that liquidity dynamics operate independently of ownership structure effects in determining crash risk.

Control Variables: Control variable patterns differ from pooled OLS, reflecting within-firm dynamics rather than between-firm differences. ROA remains positively and significantly associated with crash risk, suggesting that when firms become more profitable in a given year, they subsequently face higher crash risk. Volatility shows significant negative coefficients, suggesting that when firms experience higher return volatility in a given year, they exhibit lower crash risk in the following year after controlling for firm fixed effects. Lagged NCSKEW is negative and significant, indicating strong mean reversion in crash risk within firms.

As Robustness Check: Initial VIF diagnostics revealed severe multicollinearity ($VIF > 10$) among volatility and return measures. To address this, I retained only average firm-specific weekly returns (RET) as our primary stock performance control, dropping other correlated volatility measures (SIGMA, Volatility) and Logsize. After these adjustments, all VIF values fell below 10, confirming multicollinearity is resolved. Results remain consistent with our main findings. The results after adjustment are shown in Tables 4 and 5.

Table 4 The result of pooled OLS regressions with industry and year fixed effects examining the relationship between different types of foreign ownership and stock price crash risk after adjustment.

Variable	Pooled OLS			Pooled OLS		
	(1)	(2)	(3)	(1)	(2)	(3)
	$Nc skew_{i,t+1}$			$Du vol_{i,t+1}$		
$FIO_{i,t}$	-0.043 (0.098)	-0.044 (0.155)	-0.028 (0.101)	-0.009 (0.059)	-0.030 (0.086)	-0.009 (0.061)
$NVDR_{i,t}$	0.895*** (0.337)	0.854* (0.438)	0.904*** (0.345)	0.463** (0.218)	0.710*** (0.273)	0.475** (0.220)
$InfoAsym_{i,t}$		-0.016 (0.094)			0.17 (0.059)	
$FIO_{i,t} \times InfoAsym_{i,t}$		0.006 (0.358)			0.056 (0.200)	
$NVDR_{i,t} \times InfoAsym_{i,t}$		0.129 (1.218)			-0.875 (0.775)	
$ILLIQ_{i,t}$			0.050 (0.062)			0.035 (0.036)
$FIO_{i,t} \times ILLIQ_{i,t}$			-0.077 (0.101)			-0.006 (0.060)
$NVDR_{i,t} \times ILLIQ_{i,t}$			0.264 (0.496)			0.210 (0.400)
$ROA_{i,t}$	0.925*** (0.229)	0.929*** (0.235)	0.938*** (0.230)	0.518*** (0.142)	0.523*** (0.146)	0.541*** (0.141)

Variable	(1)	(2)	(3)	(1)	(2)	(3)
	Firm fixed effect <i>Nc skew</i> _{<i>i,t+1</i>}			Firm fixed effect <i>Du vol</i> _{<i>i,t+1</i>}		
Hypothesis Tests (H_C):						
H1C	-1.529 (0.126)			-1.258 (0.208)		
H2C		-0.101 (0.919)			0.819 (0.413)	
H3C			-1.421 (0.155)			-1.096 (0.273)

Note: Robust standard errors clustered by firm in parentheses. * $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Hypothesis tests: H1C tests $FIO_{i,t} = NVDR_{i,t}$ (Wald test t -statistic and p -value); H2C tests $FIO_{i,t} \times InfoAsym_{i,t} = NVDR_{i,t} \times InfoAsym_{i,t}$; H3C tests $FIO_{i,t} \times ILLIQ_{i,t} = NVDR_{i,t} \times ILLIQ_{i,t}$*

DISCUSSION & CONCLUSION

This study examines how different types of foreign ownership distinguished by governance rights relate to stock price crash risk in Thailand's capital market. Thailand provides a unique institutional setting where foreign investors can participate through direct ownership with voting rights or Non-Voting Depository Receipts (NVDRs) that offer economic exposure without governance power. This distinction enables direct testing of whether monitoring capability fundamentally alters the relationship between foreign capital and market stability.

Three key findings emerge. First, under pooled OLS with industry and year fixed effects, NVDR ownership is strongly and positively associated with stock price crash risk, while direct foreign ownership shows no significant relationship. The Wald test confirms this difference is statistically significant, supporting the governance rights hypothesis. Second, under firm fixed effects that control for time-invariant firm characteristics, both ownership types become statistically insignificant, suggesting the observed associations primarily reflect cross-sectional differences between firms rather than within-firm dynamics over time. Third, neither information asymmetry nor stock liquidity moderates the ownership-crash risk relationship in either specification. These findings contribute to the literature by demonstrating that governance rights not merely foreign presence determine whether foreign capital is associated with market stability in emerging markets. Prior research documents positive associations between foreign ownership and crash risk in China (Huang et al., 2020) and Vietnam (Vo, 2020). By disaggregating foreign ownership based on voting rights, we show that only non-voting ownership exhibits this association in Thailand. This distinction is theoretically meaningful: monitoring capability conferred by voting rights may constrain managerial bad-news hoarding behavior (Jin & Myers, 2006), while investors lacking governance power cannot intervene in disclosure decisions despite potentially possessing information advantages (Likitapiwat & Johnson, 2016). This disaggregation reveals that governance rights matter for crash risk, as evidenced by significant NVDR effects, suggesting that investment form influences financial stability in emerging markets.

The disappearance of effects under firm fixed effects indicates that ownership structure functions as a relatively stable firm characteristic correlating with other time-invariant attributes, rather than as a dynamic driver of crash events. This compositional nature suggests caution in interpreting pooled OLS associations as causal: firms attracting NVDR investment may systematically differ from those attracting direct foreign investment in ways influencing crash risk beyond ownership by itself.

The absence of moderation effects from information asymmetry and liquidity contrasts with findings in other markets. Huang et al. (2020) find information asymmetry amplifies foreign ownership effects in China, while Sezgin Alp et al. (2022) report liquidity moderation effects. These divergent findings may reflect unique NVDR investor characteristics, institutional

differences between Thailand and other markets, or the dominance of the governance rights mechanism over other contextual factors in the Thai setting.

The findings carry practical implications for multiple stakeholders. For policymakers and regulators, the results suggest that capital attraction policies should consider governance implications alongside economic benefits. While NVDRs successfully facilitate foreign participation beyond regulatory ownership limits, their association with elevated crash risk indicates potential stability concerns. Regulators could consider enhanced disclosure requirements for NVDR-concentrated firms to improve transparency. For investors, the findings highlight meaningful risk differences between investment channels: NVDR investors should recognize structural limitations in corporate governance despite information advantages. Investment decisions through NVDRs may require additional risk assessment in opaque or illiquid firms. This study faces limitations that present opportunities for future research. The sample focuses on SET100 firms, which may limit generalizability to smaller firms where information asymmetry and liquidity constraints are more severe. Establishing definitive causality remains challenging given potentially endogenous ownership choices; future research could exploit regulatory changes as natural experiments.

In conclusion, this study demonstrates that governance rights fundamentally shape the relationship between foreign ownership and stock price crash risk. By exploiting Thailand's unique institutional feature of NVDRs, we show that only non-voting foreign ownership associates with elevated crash risk—a distinction obscured in prior research. However, this association primarily reflects differences between firms rather than dynamic effects within firms. These findings advance understanding of how capital market structure and foreign participation jointly determine market stability in emerging economies, while highlighting the critical role of monitoring capability in differentiating stabilizing from potentially destabilizing foreign capital flows.

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Conflicts of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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