International Journal of
Financial Studies

MDPI

Article

International Diversification and Stock-Price Crash Risk

Alireza Askarzadeh [1,*], Mostafa Kanaanitorshizi [1], Maryam Tabarhosseini [2] and Dana Amiri [3]

[1] Department of Finance, Strome College of Business, Old Dominion University, 2094 Constant Hall, Norfolk, VA 23529, USA
[2] Department of Management, Strome College of Business, Old Dominion University, 2094 Constant Hall, Norfolk, VA 23529, USA
[3] Department of Marketing, Strome College of Business, Old Dominion University, 2094 Constant Hall, Norfolk, VA 23529, USA
* Correspondence: aaskarza@odu.edu; Tel.: +1-757-355-4517

Abstract: Despite the recent proliferation of research on internationalization, little attention has been paid to understanding the reasons behind the decrease in firm value accompanying international expansion. By delving into the underlying mechanisms and applying the concept of agency theory to a sample of US firms spanning from 2000 to 2022, we posit that an increased level of information asymmetry in internationally diversified firms incentivizes managers to prioritize their own interests. To protect their careers, CEOs of internationally diversified firms often suppress bad news. This behavior can lead to the accumulation of negative news and heighten the risk of a stock-price crash. Furthermore, we propose that higher levels of international experience, enhanced monitoring effectiveness, and efficient investment practices will negatively moderate the positive relationship between internationalization and stock-price crash risk.

Keywords: stock-price crash risk; internationalization; agency costs; information asymmetry

Citation: Askarzadeh, Alireza, Mostafa Kanaanitorshizi, Maryam Tabarhosseini, and Dana Amiri. 2024. International Diversification and Stock-Price Crash Risk. *International Journal of Financial Studies* 12: 47. https://doi.org/10.3390/ijfs12020047

Academic Editor: Khelifa Mazouz

Received: 24 March 2024
Revised: 10 May 2024
Accepted: 12 May 2024
Published: 15 May 2024

1. Introduction

While numerous companies have embraced international diversification strategies, scholars suggest that this globalization may lead to a decline in firm value (e.g., Denis et al. 2002). One plausible explanation for the diminished value associated with internationalization is the increased level of information asymmetry encountered by globally diversified firms (Kim and Mathur 2008). Ambitious CEOs, who compare their compensation with counterparts in internationally diversified firms, may be inclined to pursue international diversification to enhance their compensation packages, even though they understand that this decision may diminish the firm's value (Woo 2019). Despite extensive research on the impact of information asymmetry on firms' outcomes in recent years, little attention has been paid to how the market responds to this heightened lack of transparency. Specifically, this study aims to investigate how international diversification affects stock-price crash risk.

Investors are naturally anxious about abrupt declines in stock prices, as these fluctuations directly impact their financial security. Consequently, there has been notable academic interest in dissecting the intricate factors that render stocks vulnerable to significant downturns. A recent series of academic studies suggests that the practice of withholding negative news contributes significantly to the likelihood of future stock-price crashes. These studies propose that managers often refrain from disclosing unfavorable information to investors due to concerns about their personal careers and short-term compensation. As a result, when a prolonged period of negative news accumulates and reaches a critical threshold, managers may decide to disclose all accumulated negative information at once, leading to a sudden stock-price crash—a significant outlier in the distribution of returns (Hutton et al. 2009). Given that numerous firms have pursued international diversification strategies in recent years, examining how these diversification decisions impact stock-price crash risk is of significant interest to both investors and managers. Following Chin et al.

(2009), who suggest that globally diversified firms are more prone to engage in earnings manipulation, and based on the premise that withholding negative news contributes to stock-price crash risk, we propose that international diversification exacerbates managerial tendencies toward withholding negative news, consequently elevating the risk of future stock-price crashes.

Internationalization may increase the risk of stock-price crashes for two main reasons. First, engaging in international markets intensifies information asymmetry (Zamore et al. 2019), which augments both uncertainty (Qian et al. 2008) and transaction risk (Krapl 2015; Olibe et al. 2008). This scenario leads to a higher likelihood of stock-price crashes, as the increased information asymmetry provides an incentive for CEOs to withhold negative information. Second, international firms face higher monitoring costs than their domestic counterparts due to the complexities involved in coordinating and administering operations across borders. This makes monitoring less effective (Yang et al. 2022), which in turn, increases managers' propensity to withhold negative information, further elevating the risk of stock-price crashes.

Further exploration into the levels of information transparency in globally diversified firms reveals that those with extensive international experience tend to exhibit lower levels of information asymmetry compared to less experienced firms (Abdi and Aulakh 2018). We suggest that international experience may mitigate the positive correlation between internationalization and stock-price crash risk. Moreover, drawing on the findings of Choi et al. (2020), we contend that globally diversified firms with less effective monitoring experience higher information asymmetry, thereby facing an increased risk of stock-price crashes. Additionally, by analyzing investment inefficiency among diversified firms as a measure of information asymmetry, we propose that the impact of internationalization on stock-price crash risk is more pronounced in firms with greater investment inefficiencies.

Our study uses foreign sales as a percentage of total sales as a proxy for internationalization and incorporates three standard measures of stock-price crash risk to analyze the linear regression between diversification and stock-price crash risk. Our findings confirm that a higher degree of international diversification indeed elevates the risk of stock-price crashes. Furthermore, our results suggest that this relationship is moderated by factors such as enhanced international experience, effective monitoring practices, and diminished investment inefficiency.

This study makes several significant contributions to the existing literature in finance and international business. First, we build upon prior research on international diversification by validating the assertion that information asymmetry tends to be higher in internationally diversified firms (Kim and Mathur 2008). Despite a documented positive correlation between internationalization and firm value (Bhatia and Thakur 2018), Abdi and Aulakh (2018) propose a negative relationship between internationalization and performance. By confirming the positive association between internationalization and stock-price crash risk, we identify information asymmetry as a potential explanation for the connection between internationalization and performance.

Additionally, by introducing international experience (Abdi and Aulakh 2018) as a moderating factor and demonstrating that the degree of information asymmetry is inversely related to international experience, this study suggests that the relationship between internationalization and stock-price crash risk is contingent in nature and, thus, requires further contextualization. We suggest that, while internationalization correlates positively with stock-price crash risk, this correlation is tempered in firms with extensive international experience. Furthermore, by leveraging the argument concerning the negative correlation between effective monitoring and information asymmetry, this study illustrates how the relationship between international diversification and stock-price crash risk is moderated in environments where monitoring is more robust.

Finally, the study directly speaks to the scholarship on investment efficiency by offering that ineffective investment practices exacerbate information asymmetry (Choi et al. 2020).

Our findings validate that the relationship between internationalization and stock-price crash risk becomes more pronounced when investment efficiency is low.

The subsequent sections of this article are structured as follows. Section 2 reviews the literature and formulates hypotheses. Section 3 outlines data sources and introduces major variables. Section 4 delineates the methodology, presents results, and conducts robustness tests, while Section 5 concludes.

2. Literature Review and Hypothesis Development

The literature presents inconsistencies regarding the impact of internationalization on firm value. Bhatia and Thakur (2018) argue that geographic diversification boosts firm value, while Denis et al. (2002) contend that it reduces firm value compared to domestic benchmark firms. These contradictory findings, despite using the same sample period and methodology to compute excess value, could be attributed to issues in identifying samples for geographic diversification and the econometric methodology's failure to adequately address endogeneity concerns.

Proponents of international diversification, such as Ma et al. (2016) and Batsakis et al. (2018), argue that geographic diversification can enhance firm value through various mechanisms, including economies of scale, location-specific advantages, and synergy effects. It is a strategic imperative rooted in exploiting foreign-market opportunities and market imperfections through internalization. This strategy enables firms to integrate new foreign operations within their organizational framework, facilitating the exploitation of both tangible (e.g., shared market, production, and technology activities) and intangible (e.g., knowledge of foreign operations, expertise) assets. As a result, geographically diversified firms can capture monopoly rents from these intangible assets, which are difficult to transfer efficiently. Additionally, global diversification increases operational flexibility, thereby mitigating risks across markets.

However, the literature also extensively documents the costs associated with geographic diversification. Multinational corporations encounter intricate coordination challenges across multiple geographic markets to capitalize on economies of scale and scope. Despite the synergy-effect perspective, creating market synergies within the same country is often easier than across different countries. International operations also entail inherent risks, including regulatory changes, tariffs, political and economic developments, staffing and management difficulties, exchange controls, and expropriation, which may outweigh the benefits of global diversification (Krapl 2015; Olibe et al. 2008).

One possible reason for the underperformance of diversified firms is the higher agency costs they face (Zamore et al. 2019). The agency view suggests that managers may extract private benefits, such as prestige, power, and excessive compensation, from global diversification, without necessarily enhancing the shareholder value (Jensen 1986; Askarzadeh and Askarzadeh 2022). Relatedly, Denis et al. (2002) find negative valuation effects in both geographic and industrial diversification, attributing the global diversification discount to agency issues. Diversified firms may face heightened information asymmetry problems, making it challenging for boards and internal control systems to prevent suboptimal managerial decisions (Soltaninejad et al. 2024). Furthermore, there might be a negative relationship between ownership and geographic diversification, as observed in the industrial diversification literature (Denis et al. 1997), suggesting that higher ownership could mitigate diversification-related agency costs.

According to the free cash flow theory (Jensen 1986), firms with ample cash flow may be prone to investing in pet projects. Hyland (1997) empirically examines corporate diversification from an agency perspective and finds that diversifying firms tend to have more cash on hand, lower research and development investment, and higher compensation compared to specialized counterparts, supporting the agency argument.

Shleifer and Vishny (1989) argue that managers' personal gains from diversification may outweigh the gains from specialization at the expense of shareholder wealth. Denis et al. (1997) find evidence suggesting less diversification with higher managerial equity

ownership and higher block holdings, attributing this evidence to divergent interests between managers and shareholders, particularly with low insider ownership. Aggarwal and Samwick (2003) revisit these agency explanations and support the managerial entrenchment hypothesis, indicating that optimal incentive contracts mitigate managers' propensity to diversify their firms.

Managers, given their privileged access to detailed company-operations information, wield significant power over when to disclose such information (Askarzadeh et al. 2023). However, the release of negative news can jeopardize their careers, leading them to delay sharing unfavorable information in hopes of future performance improvements. The mechanism underlying corporate stock-price crash risk revolves around the tendency of managers to withhold negative information over an extended period, allowing it to accumulate. Successful withholding of negative information should result in a more negatively skewed distribution of stock returns (Callen and Fang 2015; Hutton et al. 2009). However, once the accumulated negative news surpasses a certain threshold, it is released to the market all at once, leading to a sudden sharp decline in stock prices. The agency theoretic framework proposed by Jin and Myers (2006) suggests that such crash risk can stem from information asymmetries between corporate insiders and external stakeholders.

Extensive research has explored the potential determinants of crash risk in the financial literature (e.g., An et al. 2018; Callen and Fang 2015; Ahmadirad 2024). For example, market signals, like trading volume (Chen et al. 2001) and stock liquidity (Chang et al. 2017), have been identified as predictors of future crash risk. Furthermore, the integrity of corporate-governance mechanisms appears intricately linked to crash risk. Studies by Andreou et al. (2016) suggest that factors, such as ownership structure, accounting opacity, board structure, and managerial incentives, significantly contribute to price crash risk. Additionally, analyst coverage is indicated to influence firm-specific crash risk (Xu et al. 2017). Informal institutional mechanisms also play a role in predicting crash risks, as evidenced by Lee and Wang (2017), who demonstrate that directors' political connections impact stock-price crash risk in China, and Callen and Fang (2015), who observe an influence of religious contexts on crash risk in various U.S. locales. Moreover, managerial idiosyncrasies, such as CEO overconfidence, which leads to overly optimistic future cash-flow estimations and investment in unprofitable projects, are linked to increased crash risks (Kim et al. 2016). Additionally, a study by Andreou et al. (2017) finds a negative correlation between CEO age and stock-price crash risk, suggesting that younger CEOs may have stronger incentives to withhold bad news.

Building upon this foundation, our research posits that internationally diversified firms face heightened information asymmetry, potentially leading managers to avoid disclosing negative news that could threaten their career stability (Zamore et al. 2019). Operating in foreign markets introduces additional uncertainties and more operational risks (Qian et al. 2008; Krapl 2015; Askarzadeh et al. 2021), which can exacerbate downturns in performance and stock prices. Additionally, the challenge of effectively monitoring international ventures (Yang et al. 2022) may further incentivize managers to withhold negative information, increasing the likelihood of stock-price crashes. Based on these considerations, we propose our first hypothesis as follows:

H1. *Firms characterized by international diversification are more prone to experiencing stock-price crashes.*

Given the pivotal role of information asymmetry in influencing stock-price crash risk, the connection between international diversification and stock-price crash risk can be moderated by firm-level variables that influence the extent of information asymmetry. Shohaieb et al. (2022) propose that corporate governance can impact the level of information asymmetry by influencing the disclosure of diversity management practices. Similarly, Elmarzouky et al. (2022) suggest a similar relationship by examining the effect of corporate governance on the association between key audit matters and audit costs. Although

information asymmetry tends to be high in diversified firms, its level is subject to influence by firm-level variables.

Extending the insights from Abdi and Aulakh (2018), we contend that diversified firms with extensive international experience demonstrate stronger corporate governance and reduced levels of information asymmetry compared to their less experienced counterparts. Such international experience not only enhances a firm's capability to manage cross-cultural differences effectively but also equips it to address challenges in foreign markets, thus alleviating the adverse impacts of internationalization on firm operations. Based on these discussions, we propose our subsequent hypothesis as follows:

H2. *Higher international experience negatively moderates the positive relationship between internationalization and stock-price crash risk.*

3. Model Specification and Data

3.1. Crash Risk Measures

Following Callen and Fang (2015), Equation (1) is used to compute the firm-specific daily return. For each firm year, the following regression is estimated:

$$r_{j,t} = \alpha_j + \alpha_{1,j} * r_{m,t-2} + \alpha_{2,j} * r_{m,t-1} + \alpha_{3,j} * r_{m,t} + \alpha_{4,j} * r_{m,t+1} + \alpha_{5,j} * r_{m,t+2} + \varepsilon_{i,t}, \quad (1)$$

where $r_{j,t}$ is the stock return of firm j on day t, $r_{m,t}$ is the return on the CRSP value-weighted market index on day t. To account for non-synchronous trading, two lags and two leads are included. In the subsequent stage, the residual of Equation (1), denoted as $\varepsilon_{i,t}$, is calculated. This residual represents the daily stock return that cannot be explained by the market and is associated with firm-specific idiosyncratic factors. Following this, the returns are log-transformed, and the firm-specific daily return is computed as the natural logarithm of one plus the residual return. This can be expressed as $W_{i,t} = \log(1 + \varepsilon_{i,t})$.

Building on prior research (Hutton et al. 2009; Callen and Fang 2015; Kim and Zhang 2016), we employ the following metrics to quantify the stock-price crash risk. The primary measure, NCSKEW, captures the negative skewness of firm-specific daily returns. It is computed as follows:

$$NCSKEW_{J,T} = \frac{-(n(n-1)^{(3/2)} \sum W_{(j,T)}^3)}{((n-1)(n-2)(\sum {W_{j,T}}^2)^{3/2})} \quad (2)$$

where n is the number of firm-specific daily returns during the year t for firm i.

To strengthen the robustness of our findings, we incorporate two additional measures of crash risk. The second measure, referred to as "down to up volatility" (DUVOL), is calculated in the following manner:

$$DUVOL_{j,T} = log(\frac{(n_u - 1) \sum\limits_{Down} W_{j,t}^2}{(n_d - 1) \sum\limits_{Up} W_{j,t}^2}) \quad (3)$$

where n_u and n_d are the number of up and down days over the year t, respectively. $\sum_{Down} W_{j,t}^2$ and $\sum_{Down} W_{j,t}^2$ equal the sum of R^2 for the down and up days, respectively. A firm day is defined as a down (up) day if the firm-specific daily return is below (above) its annual mean.

Lastly, the measure *CRASH* is based on the number of firm daily returns exceeding 3.09 standard deviations above or below the mean firm daily return over the calendar year. *CRASH* is calculated as the number of days where the return is lower than 3.09 standard deviations below the mean (down days) minus the number of days where the return is higher than 3.09 standard deviations above the mean (up days). A higher value for CRASH, as well as for the other two measures, indicates a greater crash risk. The selection

of 3.09 standard deviations aligns with achieving frequencies of 0.1% under the normal distribution, providing a methodologically sound benchmark for identifying extreme deviations in firm-specific daily returns. This approach follows the precedent set by Hutton et al. (2009) and Kim et al. (2011), who utilize the 0.1% cutoff of the normal distribution to effectively delineate significant variations in daily returns.

3.2. Baseline Model

To examine the effect of internationalization on stock-price crash risk, we use the following regression model:

$$Crashrisk_{i,t+1} = \alpha_0 + \alpha_1 * DOI_t + \alpha_2 * Controls_t + Industry\ FE + Year\ FE + e_{i,t+1} \quad (4)$$

where *Crashrisk* is measured by *NCSKEW*, *DUVOL*, and *CRASH*. Consistent with the approach of Abdi and Aulakh (2018), we utilize the degree of internationalization (*DOI*) as our explanatory variable to measure internationalization. *DOI* is defined as the ratio of foreign sales to total sales.

Following the methodology of Callen and Fang (2015), we include the lagged NCSKEW as our primary control variable. Additionally, we incorporate several firm-level variables to ensure comprehensive analysis. "Return" represents the cumulative firm-specific daily returns throughout the fiscal year. "SD" refers to the standard deviation of these daily returns, offering a measure of volatility. "Kurtosis" is used to assess the peakedness of the daily return distribution over the same period. We also consider "MB", defined as the ratio of the market value of equity to the book value of equity at fiscal year end, as a valuation metric.

Furthermore, "Size" is included as the natural logarithm of market capitalization at the end of the fiscal year, providing a scale of the firm's size. "Leverage" is calculated as the ratio of total liabilities to total assets at year end, indicating the degree of financial gearing. Additionally, "ROE" (return on equity) is calculated as income before extraordinary items divided by the book value of equity at the end of the fiscal year, serving as a profitability indicator. These variables are critical for controlling various aspects of financial performance and market perception in our analysis.

3.3. Sample

To compute firm-specific daily returns, we employed the Center for Research in Security Prices (CRSP) daily stock files, which include price changes and relevant dividends, covering the period from December 1999 to January 2023 for all publicly listed firms. We implemented several filters to refine our sample: (1) we excluded utility firms due to their heavy regulation; (2) we excluded financial firms because of their high leverage, which often signals financial distress in other sectors; (3) we excluded firms with less than 150 days of data within any given year; (4) we excluded firms with a market capitalization under USD 1 million; and (5) we excluded firms with missing values in Equation (4).

Our final sample encompasses the years 2000 through 2022 and includes 3188 firms, yielding 27,598 firm-year observations. We sourced firm-level control variables, such as RETURN, SD, KURTOSIS, MB, SIZE, LEVERAGE, and ROE, from the Compustat database. Descriptive statistics for the principal variables used in our models are detailed in Panel A of Table 1. The mean values for our stock-price crash risk measures—NCSKEW, DUVOL, and CRASH—are −0.359, −0.107, and −0.524, respectively, while the mean value of DOI is 0.457. Additionally, Panel B of Table 1 presents a Pearson correlation matrix for the main variables, indicating significant correlations among our measures of future stock-price crash risk at the one percent significance level.

Table 1. Summary statistics and correlation matrix.

Panel A: Summary statistics.

	N	Mean	SD	p25	Median	p75
NCSKEW	36,488	−0.359	1.250	−0.852	−0.31	0.182
DUVOL	36,488	−0.107	0.221	−0.236	−0.099	0.032
CRASH	36,488	−0.524	1.618	−2	−1	1
DOI	36,488	0.457	0.308	0.194	0.408	0.686
DOI_{asset}	7665	0.463	0.336	0.165	0.395	0.644
Return	33,613	0.153	0.572	−0.194	0.078	0.367
SD	33,613	0.03	0.016	0.019	0.026	0.037
Kurtosis	33,613	6.538	8.710	1.691	3.392	7.454
M/B	33,605	3.334	3.581	1.39	2.243	3.784
Size	33,057	8.019	1.915	6.569	8.015	9.376
Leverage	28,103	0.232	0.167	0.095	0.216	0.342
ROE	33,603	0.016	0.371	−0.018	0.086	0.163

Panel B: Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) NCSKEW	1.000											
(2) DUVOL	0.877 ***	1.000										
(3) CRASH	0.550 ***	0.617 ***	1.000									
(4) DOI	0.033 ***	0.024 ***	0.019 ***	1.000								
(5) DOI_{asset}	0.065 ***	0.047 ***	0.058 ***	0.880 ***	1.000							
(6) Return	0.079 *	0.109 **	0.072 *	−0.002	0.012	1.000						
(7) SD	−0.171 *	−0.251 *	−0.217 *	−0.050	−0.087	−0.025 *	1.000					
(8) Kurtosis	−0.041 **	−0.027 **	−0.020 *	0.017 **	−0.012 *	−0.003	0.153 *	1.000				
(9) M/B	0.062 ***	0.083 ***	0.064 *	0.025 ***	0.044 **	0.195 *	−0.053 *	0.021	1.000			
(10) Size	0.145 *	0.184 **	0.177	−0.020 *	−0.066 **	−0.034 **	−0.453	−0.102 *	0.021 *	1.000		
(11) Leverage	0.021 ***	0.035 ***	0.036 *	0.035 *	0.039	−0.025 **	−0.109	−0.001	0.139 **	0.207 *	1.000	
(12) ROE	0.129 *	0.164 **	0.140 *	0.015 *	−0.039	0.130 ***	−0.390 *	−0.057	0.031 ***	0.281 **	−0.022 **	1.000

Note: Panel A of the table presents summary statistics for our sample. Notably, financial and utility firms have been excluded from the analysis. The financial variables of firms are winsorized at the 1st and 99th percentiles to mitigate the impact of outliers and ensure the robustness of the analysis. Panel B depicts pairwise correlations between the variables under consideration, providing insights into the relationships among them. Significance levels are denoted by *, **, and ***, representing statistical significance at the 10%, 5%, and 1% levels, respectively.

4. Results and Discussion

4.1. Baseline Model

By emphasizing the higher information asymmetry within firms that expand into countries with less-developed economies compared to their home country, coupled with the consideration of the higher costs associated with internationalization relative to its benefits, we suggested a positive correlation between internationalization and stock-price crash risk. To explore this relationship, we utilize Equation (4) and anticipate observing a positive and statistically significant coefficient for DOI. All regressions control for year and industry (two-digit SIC) fixed effects. Regression equations are estimated using pooled ordinary least squares (OLS) with White (1980) standard errors, corrected for firm clustering. As presented in Table 2, the coefficients associated with DOI are positive and significant at the one percent level, indicating a positive relationship between internationalization and stock-price crash risk. The economic implications of internationalization on stock-price crash risk are noteworthy. Specifically, a one standard deviation increase in DOI corresponds to a 14%, 6.81%, and 7.63% increase in NCSKEW, DUVOL, and CRASH, respectively, compared to the sample mean. In line with the majority of studies on stock-price crash risk (e.g., An et al. 2018; Callen and Fang 2015), the R^2 values of the models tend to be relatively small. This is primarily due to the intricate nature of stock-price crash risk, which is influenced by numerous factors.

Consistent with prior research (e.g., Callen and Fang 2015; An et al. 2018), the coefficients of M/B, size, and return exhibit positive values, whereas the coefficient of leverage demonstrates a negative and statistically significant value. The positive coefficient associated with internationalization could potentially be attributed to the heightened level of information asymmetry in diversified firms, which may incentivize managers to withhold adverse news, consequently amplifying the risk of stock-price crashes.

We have confirmed that international diversification increases stock-price crash risk. By highlighting managerial tendencies to hoard bad news as a key factor influencing stock-price crash risk, the positive correlation between internationalization and stock-price crash risk is due to agency problems in diversified firms. This finding sheds light on

the conflicting results about the effect of international diversification and information asymmetry.

Table 2. Internationalization and stock-price crash risk.

	(1)	(2)	(3)
VARIABLES	**$NCSKEW_{t+1}$**	**$DUVOL_{t+1}$**	**$CRASH_{t+1}$**
DOI_t	0.141 ***	0.0219 ***	0.130 ***
	(0.0277)	(0.0046)	(0.0351)
$NCSKEW_t$	0.0380 ***	0.0071 ***	0.0285 ***
	(0.0089)	(0.00142)	(0.0094)
$Return_t$	0.201 ***	0.0409 ***	0.224 ***
	(0.0166)	(0.0028)	(0.0212)
SD_t	−9.727 ***	−2.134 ***	−15.15 ***
	(0.780)	(0.135)	(0.994)
$Kurtosis_t$	−0.00102	0.0001	0.00210 *
	(0.0011)	(0.0001)	(0.0011)
M/B_t	0.0109 ***	0.0023 ***	0.0166 ***
	(0.0022)	(0.0003)	(0.0026)
$Size_t$	0.0584 ***	0.0125 ***	0.0889 ***
	(0.0048)	(0.0008)	(0.0066)
$Leverage_t$	−0.108 **	−0.0260 ***	−0.181 ***
	(0.0521)	(0.0089)	(0.0671)
ROE_t	0.147 ***	0.0285 ***	0.188 ***
	(0.0248)	(0.0042)	(0.0297)
Constant	−0.623 ***	−0.157 ***	−0.865 ***
	(0.0585)	(0.0099)	(0.0772)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	27,598	27,598	27,598
R squared	0.065	0.151	0.082

Table 2 presents the results from estimating Equation (4), which investigates the impact of internationalization on stock-price crash risk. All variables are explained in Appendix A. Industry fixed effects are incorporated using a two-digit SIC code, and standard errors, clustered at the firm level, are reported in parentheses. Significance levels are denoted by *, **, and ***, representing statistical significance at the 10%, 5%, and 1% levels, respectively.

4.2. Cross-Sectional Heterogeneity

4.2.1. International Experience

We expect the relationship between internationalization and stock-price crash risk to vary among firms. We hypothesize that firms with more international experience will exhibit lower levels of information asymmetry. This international experience is measured by duration, which is indicated by the number of years a firm has foreign sales data available in Compustat. In Equation (5), we introduce duration as a moderating variable to assess its effect on the relationship between internationalization and stock-price crash risk.

$$Crashrisk_{t+1} = \alpha_0 + \alpha_1 * DOI_t + \alpha_2 * Duration_t + \alpha_3 * DOI_t * Duration_t + Controls_t + IndustryFE + YearFE. \quad (5)$$

The regression results using Equation (5) are outlined in Table 3. The coefficient of the interaction variable, DOI*Duration, is negative and significant at the 1 percent level for NCSKEW and DUVOL and the 10 percent level for CRASH. This suggests that international experience acts as a moderator, mitigating the positive relationship between internationalization and stock-price crash risk.

Table 3. Moderating role of international experience.

	(1)	(2)	(3)
VARIABLES	**$NCSKEW_{t+1}$**	**$DUVOL_{t+1}$**	**$CRASH_{t+1}$**
DOI_t	0.226 ***	0.0365 ***	0.206 ***
	(0.0428)	(0.0072)	(0.0546)
$Duration_t$	0.0009	0.0001	0.0027
	(0.0016)	(0.0002)	(0.0021)
$DOI_t \times Duration_t$	−0.007 ***	−0.0012 ***	−0.0062 *
	(0.0025)	(0.0004)	(0.0033)
$NCSKEW_t$	0.0370 ***	0.00695 ***	0.0279 ***
	(0.0089)	(0.0014)	(0.0094)
$Return_t$	0.201 ***	0.0408 ***	0.224 ***
	(0.0166)	(0.0028)	(0.0212)
SD_t	−10.10 ***	−2.197 ***	−15.21 ***
	(0.791)	(0.137)	(1.000)
$Kurtosis_t$	−0.0009	0.0001	0.00210 *
	(0.0011)	(0.0001)	(0.0011)
M/B_t	0.0108 ***	0.00229 ***	0.0165 ***
	(0.0022)	(0.0003)	(0.0026)
$Size_t$	0.0630 ***	0.0133 ***	0.0894 ***
	(0.0050)	(0.0008)	(0.0069)
$Leverage_t$	−0.114 **	−0.0270 ***	−0.181 ***
	(0.0523)	(0.009)	(0.0673)
ROE_t	0.149 ***	0.0288 ***	0.190 ***
	(0.0248)	(0.0042)	(0.0297)
Constant	−0.653 ***	−0.162 ***	−0.900 ***
	(0.0607)	(0.0104)	(0.0802)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	27,598	27,598	27,598
R squared	0.066	0.152	0.082

Table 3 presents the results from estimating Equation (5), which explores the moderating role of international experience on the relationship between internationalization and stock-price crash risk. All variables are explained in Appendix A. Industry fixed effects are introduced using two-digit SIC codes, and standard errors, clustered at the firm level, are reported in parentheses. Significance levels are indicated by *, **, and ***, representing statistical significance at the 10%, 5%, and 1% levels, respectively.

Consistent with the findings of Abdi and Aulakh (2018), who proposed that international experience moderates the adverse relationship between internationalization and performance, our results indicate that international experience also moderates the negative association between international diversification and stock-price crash risk. This can be explained by the observation that diversified firms with greater international experience tend to exhibit reduced levels of information asymmetry. Consequently, this reduction in information asymmetry helps to moderate the adverse relationship between international diversification and stock-price crash risk.

For firms with limited international experience, there tends to be a positive relationship between their degree of internationalization and the risk of a stock-price crash. These firms, being new to international markets, may struggle with the necessary organizational capabilities for cross-border activities, potentially leading to a higher information asymmetry compared to firms with higher international experience. However, our results highlight a subset of companies with high international experience and high levels of DOI that exhibit lower stock-price crash risk compared to less experienced firms, even with a lower DOI.

This can be attributed to the fact that more experienced firms overcome the challenges associated with internationalization and lower the information asymmetry.

4.2.2. Monitoring Channel

The increased complexity and information asymmetry associated with internationalization weaken the effectiveness of monitoring mechanisms. Consequently, substantial agency problems emerge within international firms (Zamore et al. 2019). Therefore, we expect that internationalization exacerbates stock-price crash risk, as these agency problems become more acute. To assess this hypothesis, we conduct the following regression:

$$Crashrisk_{t+1} = \alpha_0 + \alpha_1 * DOI_t + \alpha_2 * AC_t + \alpha_3 * DOI_t * AC_t + Controls_t + IndustryFE + YearFE, \quad (6)$$

where AC represents agency costs. To proxy for agency costs, we follow Choi et al. (2020) and use cash holdings. If ineffective monitoring amplifies the stock-price crash risk in international firms, we anticipate a positive coefficient ($\alpha 3$) for DOIAC. As depicted in Table 4, the coefficient for DOIAC ($\alpha 3$) is positive and significant at the 5 percent level when crash risk is proxied with DUVOL and at the 10 percent level for CRASH. It falls slightly short of significance at the 10 percent level when crash risk is proxied with NCSKEW. These findings confirm our proposition that ineffective monitoring exacerbates the positive relationship between internationalization and stock-price crash risk.

Table 4. Moderating role of monitoring effectiveness.

	(1)	(2)	(3)
VARIABLES	**$NCSKEW_{t+1}$**	**$DUVOL_{t+1}$**	**$CRASH_{t+1}$**
DOI_t	0.0937 **	0.0123 *	0.0545
	(0.0399)	(0.0068)	(0.0517)
$Cash_t$	−0.167	−0.0178	−0.165
	(0.121)	(0.0210)	(0.169)
DOI_t*$Cash_t$	0.334	0.0596 *	0.608 **
	(0.208)	(0.0357)	(0.276)
$NCSKEW_t$	0.0336 ***	0.00630 ***	0.0255 ***
	(0.0093)	(0.0014)	(0.0099)
$Return_t$	0.189 ***	0.0385 ***	0.203 ***
	(0.0176)	(0.003)	(0.0229)
SD_t	−9.647 ***	−2.162 ***	−15.02 ***
	(0.833)	(0.147)	(1.091)
$Kurtosis_t$	−0.0004	0.0001	0.0023 *
	(0.0011)	(0.0001)	(0.0012)
M/B_t	0.0130 ***	0.0026 ***	0.0181 ***
	(0.0027)	(0.0004)	(0.0031)
$Size_t$	0.0590 ***	0.0125 ***	0.0916 ***
	(0.0051)	(0.0009)	(0.0071)
$Leverage_t$	−0.119 **	−0.0240 **	−0.150 **
	(0.0585)	(0.0100)	(0.0756)
ROE_t	0.162 ***	0.0323 ***	0.223 ***
	(0.0265)	(0.0046)	(0.0331)
Constant	−0.614 ***	−0.156 ***	−0.880 ***
	(0.0669)	(0.0114)	(0.0899)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 4. *Cont.*

	(1)	(2)	(3)
VARIABLES	**$NCSKEW_{t+1}$**	**$DUVOL_{t+1}$**	**$CRASH_{t+1}$**
Observations	25,181	25,181	25,181
R squared	0.064	0.152	0.082

Table 4 presents the results from estimating Equation (6), which examines the effect of monitoring effectiveness—proxied by cash holdings—on stock-price crash risk. All variables are explained in Appendix A. Industry fixed effects are introduced using two-digit SIC codes, and standard errors, clustered at the firm level, are reported in parentheses. Significance levels are indicated by *, **, and ***, representing statistical significance at the 10%, 5%, and 1% levels, respectively.

To further investigate the impact of information asymmetry on the relationship between stock-price crash risk and internationalization, we employ the method developed by Choi et al. (2020) to calculate investment inefficiency as a proxy for information asymmetry. We divide the sample into sub-groups characterized by high and low investment inefficiency, allowing us to examine how internationalization affects stock-price crash risk within these categories. Here, the "low sample" includes observations where investment inefficiency is below the sample median, and the "high sample" consists of those above the median.

We hypothesize that the link between internationalization and stock-price crash risk will be stronger in the high investment inefficiency group. To test this hypothesis, we calculate the degree of internationalization (DOI) coefficients for both sub-samples and perform an F-test to determine if the differences in these coefficients are statistically significant.

Table 5 presents the outcomes, showing the impact of internationalization on stock-price crash risk in both the low and high investment inefficiency samples. The F-test confirms that the DOI coefficients for the two samples significantly differ, with statistical significance at the five percent level for CRASH and the one percent level for NCSKEW and DUVOL. These results suggest that greater investment inefficiency, indicative of increased information asymmetry, exacerbates the negative association between internationalization and the risk of stock-price crashes.

Table 5. Internationalization and stock-price crash risk: The role of investment inefficiency.

	$NCSKEW_{t+1}$		**$DUVOL_{t+1}$**		**$CRASHCOUNT_{t+1}$**	
	Low Investment Inefficiency	**High Investment Inefficiency**	**Low Investment Inefficiency**	**High Investment Inefficiency**	**Low Investment Inefficiency**	**High Investment Inefficiency**
DOI_t	0.085 *** (0.029)	0.141 *** (0.033)	0.003 (0.008)	0.022 *** (0.006)	0.014 (0.050)	0.177 *** (0.049)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,799	13,799	13,799	13,799	13,799	13,799
R squared	0.044	0.065	0.094	0.150	0.051	0.076
F-Test of equal coefficient estimates on DOI	3.33 * (0.068)		2.94 * (0.086)		5.38 ** (0.020)	

Table 5 compares the results of the effect of internationalization on stock-price crash risk in samples with low and high investment inefficiency. The "low sample" refers to observations with investment inefficiency lower than the sample median, while the "high sample" refers to observations with investment inefficiency higher than the sample median. All variables are explained in Appendix A. Industry fixed effects are introduced using two-digit SIC codes, and standard errors, clustered at the firm level, are reported in parentheses. Significance levels are indicated by *, **, and ***, representing statistical significance at the 10%, 5%, and 1% levels, respectively.

4.3. Endogeneity Concerns

Our results may be affected by endogeneity issues in regression if stock-price crash risk and internationalization are determined endogenously. To address potential endogeneity concerns in our regression analysis, we adopt a two-stage instrumental variable approach. Following the methodology described by Attig et al. (2016), we use PNFOR—a measure representing the proportion of firms with foreign sales within the industry in a given year—as the instrumental variable for the degree of internationalization (DOI).

The results of the two-stage least squares regression are summarized in Table 6. In column (1), *PNFOR* demonstrates a positive and statistically significant association with *DOI*. Columns (2), (3), and (4) present the second-stage regression results for *NCSKEW*, *DUVOL*, and *CRASH*, respectively.

Table 6. Two-stage instrumental variable analysis.

	(1)	(2)	(3)	(4)
VARIABLES	**DOI_t**	**$NCSKEW_{t+1}$**	**$DUVOL_{t+1}$**	**$CRASH_{t+1}$**
$PNFOR_{t-1}$	0.389 ***			
	(0.0520)			
Fitted DOI_r		0.141 ***	0.0220 ***	0.134 ***
		(0.0275)	(0.0045)	(0.0350)
$NCSKEW_t$	−0.0078 ***	0.0391 ***	0.0073 ***	0.0295 ***
	(0.0017)	(0.0089)	(0.0014)	(0.0094)
$Return_t$	−0.00340	0.202 ***	0.0410 ***	0.225 ***
	(0.0035)	(0.0166)	(0.0028)	(0.0211)
SD_t	1.412 ***	−9.924 ***	−2.164 ***	−15.32 ***
	(0.249)	(0.779)	(0.135)	(0.991)
$Kurtosis_t$	−0.0004 *	−0.0009	0.0001	0.0021 *
	(0.0002)	(0.0011)	(0.0001)	(0.0011)
M/B_t	−0.001	0.0111 ***	0.0023 ***	0.0167 ***
	(0.001)	(0.0022)	(0.0003)	(0.0026)
$Size_t$	0.0217 ***	0.0553 ***	0.0120 ***	0.0861 ***
	(0.0032)	(0.0048)	(0.0008)	(0.0066)
$Leverage_t$	−0.0275	−0.104 **	−0.0253 ***	−0.178 ***
	(0.0291)	(0.0522)	(0.0089)	(0.0671)
ROE_t	0.0012	0.146 ***	0.0284 ***	0.188 ***
	(0.0079)	(0.0248)	(0.0042)	(0.0297)
Constant	0.0583	−0.515 ***	−0.141 ***	−0.766 ***
	(0.0389)	(0.0537)	(0.0092)	(0.0714)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	27,598	27,598	27,598	27,598
R squared	0.138	0.065	0.151	0.082

Table 6 presents the results from estimating the two-stage least squares regression model to address endogeneity concerns. Column (1) reports the first stage with *DOI* as the dependent variable and PNFOR as the instrumental variable. Columns (2) to (4) provide the results for all three measures of stock-price crash risk using the fitted value of *DOI* from the first stage. All the variables are explained in Appendix A. Industry fixed effects are incorporated using two-digit SIC codes, and standard errors, clustered at the firm level, are reported in parentheses. Significance levels are indicated by *, **, and ***, representing statistical significance at the 10%, 5%, and 1% levels, respectively.

As depicted in columns (2) to (4), the fitted value of *DOI* consistently exhibits a positive and significant relationship at the 1% level. This indicates that our baseline model results remain robust and unaffected by endogeneity issues.

4.4. Alternative Measures of Internationalization

To further confirm the robustness of our baseline results, we employed alternative measures of internationalization. Table 7 presents the results with internationalization measured by the ratio of foreign assets to total assets (FATA) and by the average of FATA and the ratio of foreign sales to total sales (FSTS), respectively.

Table 7. Alternative measures of internationalization.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**$NCSKEW_{t+1}$**	**$DUVOL_{t+1}$**	**$CRASH_{t+1}$**	**$NCSKEW_{t+1}$**	**$DUVOL_{t+1}$**	**$CRASH_{t+1}$**
DOI_{asset}	0.227 ***	0.0346 ***	0.339 ***			
	(0.0518)	(0.0091)	(0.0699)			
$(DOI_{sale} + DOI_{asset})/2$				0.241 ***	0.0356 ***	0.347 ***
				(0.0535)	(0.0095)	(0.0729)
$NCSKEW_t$	0.0515 ***	0.0119 ***	0.0602 ***	0.0511 **	0.0118 ***	0.0599 ***
	(0.0199)	(0.0031)	(0.0204)	(0.0199)	(0.0031)	(0.0204)
$Return_t$	0.201 ***	0.0411 ***	0.233 ***	0.200 ***	0.0410 ***	0.232 ***
	(0.031)	(0.0055)	(0.0412)	(0.0310)	(0.0055)	(0.0413)
SD_t	−8.655 ***	−2.152 ***	−17.50 ***	−8.525 ***	−2.139 ***	−17.39 ***
	(1.671)	(0.288)	(1.959)	(1.669)	(0.287)	(1.966)
$Kurtosis_t$	−0.002	0.0002	0.0068 **	−0.0021	0.0002	0.0066 **
	(0.0027)	(0.0004)	(0.0028)	(0.0027)	(0.0004)	(0.0028)
M/B_t	0.0153 ***	0.0028 ***	0.0126 **	0.0157 ***	0.0028 ***	0.0132 **
	(0.0055)	(0.0009)	(0.0059)	(0.0055)	(0.0009)	(0.0059)
$Size_t$	0.0752 ***	0.0136 ***	0.108 ***	0.0758 ***	0.0137 ***	0.108 ***
	(0.0109)	(0.0018)	(0.0146)	(0.0109)	(0.0018)	(0.0146)
$Leverage_t$	−0.0370	−0.0264	−0.218	−0.0508	−0.0285	−0.237 *
	(0.107)	(0.0188)	(0.134)	(0.107)	(0.0188)	(0.134)
ROE_t	0.184 ***	0.0306 ***	0.0785	0.182 ***	0.0302 ***	0.0741
	(0.0591)	(0.0099)	(0.0712)	(0.0590)	(0.0099)	(0.0710)
Constant	−0.911 ***	−0.184 ***	−1.099 ***	−0.922 ***	−0.184 ***	−1.101 ***
	(0.133)	(0.0225)	(0.163)	(0.132)	(0.0225)	(0.165)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5779	5779	5779	5779	5779	5779
R squared	0.086	0.163	0.095	0.086	0.163	0.095

Table 7 presents regression results using FATA and the average of FATA and FSTS as alternative measures of internationalization. All variables are explained in Appendix A. Industry fixed effects are incorporated using two-digit SIC codes. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance levels are denoted by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.

Columns (1) through (3) report the results with internationalization measured by FATA, while columns (4) through (6) present the results with internationalization measured by the average of FATA and FSTS. Consistent with the baseline results reported earlier, the findings in Table 7 reaffirm that the relationship between internationalization and stock-price crash risk remains positive and significant.

The economic implications of internationalization on stock-price crash risk are even higher when international diversification is proxied by FATA. Specifically, a one standard deviation increase in FATA corresponds to a 24.6%, 11.7%, and 11.3% increase in NCSKEW, DUVOL, and CRASH, respectively, compared to the sample median. The greater economic significance of FATA compared to FSTS can be attributed to the fact that having foreign assets increases information asymmetry to a greater extent than having foreign sales. This

heightened information asymmetry amplifies the relationship between internationalization and stock-price crash risk.

5. Conclusions

Given its significant impact on firm performance, internationalization is regarded as one of the most crucial investment decisions that firms undertake. However, the literature presents conflicting findings regarding the relationship between internationalization and firm performance. Unlike prior studies that primarily focus on the financial aspects of international firms, this research examines the impact of internationalization on information asymmetry and agency costs. Specifically, it aims to address the inconsistent evidence in the literature by investigating the influence of internationalization on firms' stock-price crash risk.

Using agency-theory arguments and highlighting the enhanced information asymmetry in internationally diversified firms, this study suggests that managers of diversified firms are more likely to hoard bad news, leading to an accumulation of bad news and subsequent stock-price crash risk.

Additionally, in addition to the positive relationship between internationalization and stock-price crash risk, we identify a moderating variable. We introduce international experience and argue that the level of information asymmetry in diversified firms is inversely correlated with international experience. Confirming that the relationship between internationalization and stock-price crash risk is attenuated when international experience is high.

Furthermore, building on previous arguments that suggest managers' tendency to hoard bad news is a key factor in influencing stock-price crash risk, we propose that better monitoring can mitigate managers' ability to hoard bad news. Using cash holding as a proxy for agency problems, we confirm that the relationship between internationalization and stock-price crash risk is pronounced when monitoring effectiveness diminishes.

Lastly, to further confirm the effect of information asymmetry on stock-price crash risk in diversified firms, we compare the stock-price crash risk in diversified firms with high and low investment inefficiency, leveraging the argument that the level of information asymmetry is higher in firms with higher investment inefficiency. Our results confirm that the relationship between internationalization and stock-price crash risk is more pronounced when investment inefficiency is higher.

Offering a novel perspective on internationalization, this study underscores its adverse effects on non-financial performance. The positive relationship between internationalization and stock-price crash risk highlights the necessity of considering a broad range of organizational and industrial factors when analyzing global expansion decisions. This nuanced understanding can provide valuable insights for both researchers and managers navigating the complexities of international business decisions.

This study presents significant implications for managers of internationally diversified firms, shedding light on the heightened level of information asymmetry within such firms and providing insights into strategies for mitigating this imbalance. Furthermore, the study underscores implications for investors, emphasizing the elevated risk of stock-price crashes associated with these firms.

This study has some limitations. First, our sample consists of US firms with international sales predominantly in countries with less-developed economies compared to the US. It is important to note that the level of information asymmetry varies depending on whether firms expand from developed to developing countries or vice versa. Future research could explore firms from developing countries with international sales in developed countries to provide a more comprehensive understanding. Although there are documented sources highlighting the non-linear effect of international diversification on firm performance (e.g., Abdi and Aulakh 2018; Contractor 2007), our study investigates the linear relationship between internationalization and stock-price crash risk. Exploring

the non-linear relationship between diversification and stock-price crash risk presents an avenue for future studies.

Author Contributions: A.A.: Conceptualization, Methodology, Formal Analysis, Investigation, and Writing. M.K.: Methodology, Formal Analysis, Investigation, and Writing. M.T.: Methodology, Formal Analysis, Investigation, and Writing. D.A.: Methodology, Formal Analysis, Investigation, and Writing. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Informed Consent Statement: Exclude it because the study did not involve humans.

Data Availability Statement: The data that support the findings of this study are available from CRSP and the Compustat database, but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. After receiving the needed permission from the listed databases, data can be provided upon request to the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest. All authors have read and agreed to the published version of the manuscript.

Appendix A. Variable Definitions

Variable	Definition
NCSKEW	The negative coefficient of skewness of firm-specific daily returns over the fiscal year.
DUVOL	The log of the ratio of the standard deviation of firm-specific daily returns for the "down-day" sample to the standard deviation of firm-specific daily returns for the "up-day" sample over the fiscal year.
CRASH	The number of firm-specific daily returns exceeding 3.09 standard deviations below the mean firm-specific daily return over the fiscal year minus the number of firm-specific daily returns exceeding 3.09 standard deviations above the mean firm-specific daily return over the fiscal year.
DOI_{Sale}	Degree of internationalization, defined as foreign sales divided by total sales.
DOI_{asset}	Degree of internationalization, defined as foreign assets divided by total assets.
Return	The cumulative firm-specific daily returns over the fiscal year.
SD	The standard deviation of firm-specific daily returns over the fiscal year.
Kurtosis	The kurtosis of firm-specific daily returns over the fiscal year.
M/B	The market value of equity divided by the book value of equity.
Size	The log value of market capitalization at the end of the fiscal year.
Leverage	The book value of all liabilities divided by total assets at the end of the fiscal year.
ROE	Income before extraordinary items divided by the book value of equity at the end of the fiscal year.
Duration	Number of years a firm has international sales data in Compustat.
Cash	The ratio of cash and cash equivalents to sales.

References

Abdi, Majid, and Preet S. Aulakh. 2018. Internationalization and performance: Degree, duration, and scale of operations. *Journal of International Business Studies* 49: 832–57. [CrossRef]

Aggarwal, Rajesh K., and Andrew A. Samwick. 2003. Why do managers diversify their firms? Agency reconsidered. *The Journal of Finance* 58: 71–118. [CrossRef]

Ahmadirad, Zahra. 2024. Evaluating the Influence of AI on Market Values in Finance: Distinguishing Between Authentic Growth and Speculative Hype. *International Journal of Advanced Research in Humanities and Law* 1: 50–57. [CrossRef]

An, Zhe, Zhian Chen, Donghui Li, and Lu Xing. 2018. Individualism and stock price crash risk. *Journal of International Business Studies* 49: 1208–36. [CrossRef]

Andreou, Panayiotis C., Constantinos Antoniou, Joanne Horton, and Christodoulos Louca. 2016. Corporate governance and firm-specific stock price crashes. *European Financial Management* 22: 916–56. [CrossRef]

Andreou, Panayiotis C., Christodoulos Louca, and Andreas P. Petrou. 2017. CEO age and stock price crash risk. *Review of Finance* 21: 1287–325. [CrossRef]

Askarzadeh, Fatemeh, and Alireza Askarzadeh. 2022. The Double-Edged Effects of Institutional Deviance. *Academy of Management Proceedings* 2022: 18041. [CrossRef]
Askarzadeh, Fatemeh, Hamed Yousefi, and Mahdi Forghani Bajestani. 2021. Strong alien or weak acquaintance? The effect of perceived institutional distance and cross-national uncertainty on ownership level in foreign acquisitions. *Review of International Business and Strategy* 31: 177–95. [CrossRef]
Askarzadeh, Alireza, Kenneth Yung, and Mohammad Najand. 2023. Managerial sentiment and predicted and opportunistic special items. *Journal of Corporate Accounting & Finance* 34: 302–17.
Attig, Najah, Narjess Boubakri, Sadok El Ghoul, and Omrane Guedhami. 2016. Firm internationalization and corporate social responsibility. *Journal of Business Ethics* 134: 171–97. [CrossRef]
Batsakis, Georgios, Geoffrey Wood, Goudarz Azar, and Satwinder Singh. 2018. International diversification and firm performance in the post-acquisition period: A resource dependence perspective. *Journal of Business Research* 93: 151–59. [CrossRef]
Bhatia, Aparna, and Anu Thakur. 2018. Corporate diversification and firm performance: An empirical investigation of causality. *International Journal of Organizational Analysis* 26: 202–25. [CrossRef]
Callen, Jeffrey L., and Xiaohua Fang. 2015. Religion and stock price crash risk. *Journal of Financial and Quantitative Analysis* 50: 169–95. [CrossRef]
Chang, Xin, Yangyang Chen, and Leon Zolotoy. 2017. Stock liquidity and stock price crash risk. *Journal of Financial and Quantitative Analysis* 52: 1605–37. [CrossRef]
Chen, Joseph, Harrison Hong, and Jeremy C. Stein. 2001. Forecasting crashes: Trading volume, past returns, and conditional skewness in stock prices. *Journal of Financial ECONOMICS* 61: 345–81. [CrossRef]
Chin, Chen-Lung, Yu-Ju Chen, and Tsun-Jui Hsieh. 2009. International diversification, ownership structure, legal origin, and earnings management: Evidence from Taiwan. *Journal of Accounting, Auditing & Finance* 24: 233–62.
Choi, Jin Kyung, Rebecca N. Hann, Musa Subasi, and Yue Zheng. 2020. An empirical analysis of analysts' capital expenditure forecasts: Evidence from corporate investment efficiency. *Contemporary Accounting Research* 37: 2615–48. [CrossRef]
Contractor, Farok J. 2007. Is international business good for companies? The evolutionary or multi-stage theory of internationalization vs. the transaction cost perspective. *Management International Review* 47: 453–75. [CrossRef]
Denis, David J., Diane K. Denis, and Atulya Sarin. 1997. Agency problems, equity ownership, and corporate diversification. *The journal of Finance* 52: 135–60. [CrossRef]
Denis, David J., Diane K. Denis, and Keven Yost. 2002. Global diversification, industrial diversification, and firm value. *The Journal of Finance* 57: 1951–79. [CrossRef]
Elmarzouky, Mahmoud, Khaled Hussainey, and Tarek Abdelfattah. 2022. The key audit matters and the audit cost: Does governance matter? *International Journal of Accounting & Information Management* 31: 195–217.
Hutton, Amy P., Alan J. Marcus, and Hassan Tehranian. 2009. Opaque financial reports, R2, and crash risk. *Journal of Financial Economics* 94: 67–86. [CrossRef]
Hyland, David Clark. 1997. *Why Firms Diversify: An Empirical Examination*. Columbus: The Ohio State University.
Jensen, Michael C. 1986. Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review* 76: 323–29.
Jin, Li, and Stewart C. Myers. 2006. R2 around the world: New theory and new tests. *Journal of Financial Economics* 79: 257–92. [CrossRef]
Kim, Jeong-Bon, Zheng Wang, and Liandong Zhang. 2016. CEO overconfidence and stock price crash risk. *Contemporary Accounting Research* 33: 1720–49. [CrossRef]
Kim, Jeong-Bon, and Liandong Zhang. 2016. Accounting conservatism and stock price crash risk: Firm-level evidence. *Contemporary Accounting Research* 33: 412–41. [CrossRef]
Kim, Jeong-Bon, Yinghua Li, and Liandong Zhang. 2011. Corporate tax avoidance and stock price crash risk: Firm-level analysis. *Journal of Financial Economics* 100: 639–62. [CrossRef]
Kim, Young Sang, and Ike Mathur. 2008. The impact of geographic diversification on firm performance. *International Review of Financial Analysis* 17: 747–66. [CrossRef]
Krapl, Alain A. 2015. Corporate international diversification and risk. *International Review of Financial Analysis* 37: 1–13. [CrossRef]
Lee, Wei, and Lihong Wang. 2017. Do political connections affect stock price crash risk? Firm-level evidence from China. *Review of Quantitative Finance and Accounting* 48: 643–76. [CrossRef]
Ma, Hanyang, Saixing Zeng, Geoffrey Qiping Shen, Han Lin, and Hongquan Chen. 2016. International diversification and corporate social responsibility: An empirical study of Chinese contractors. *Management Decision* 54: 750–74. [CrossRef]
Olibe, Kingsley O., Franklin A. Michello, and Jerry Thorne. 2008. Systematic risk and international diversification: An empirical perspective. *International Review of Financial Analysis* 17: 681–98. [CrossRef]
Qian, Gongming, Lee Li, Ji Li, and Zhengming Qian. 2008. Regional diversification and firm performance. *Journal of International Business Studies* 39: 197–214. [CrossRef]
Shleifer, Andrei, and Robert W. Vishny. 1989. Management entrenchment: The case of manager-specific investments. *Journal of Financial Economics* 25: 123–39. [CrossRef]
Shohaieb, Doaa, Mahmoud Elmarzouky, and Khaldoon Albitar. 2022. Corporate governance and diversity management: Evidence from a disclosure perspective. *International Journal of Accounting & Information Management* 30: 502–25.

Soltaninejad, Mahsa, Reyhaneh Aghazadeh, Samin Shaghaghi, and Majid Zarei. 2024. Using Machine Learning Techniques to Forecast Mehram Company's Sales: A Case Study. *Journal of Business and Management Studies* 6: 42–53. [CrossRef]

White, Halbert. 1980. A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica* 48: 817–38. [CrossRef]

Woo, Heejin. 2019. The effect of CEO compensation structure on the early internationalization of newly public firms. *The International Journal of Human Resource Management* 30: 1977–96. [CrossRef]

Xu, Nianhang, Xuanyu Jiang, Kam C. Chan, and Shinong Wu. 2017. Analyst herding and stock price crash risk: Evidence from China. *Journal of International Financial Management & Accounting* 28: 308–48.

Yang, Jianfa, Guilong Cai, Guojian Zheng, and Qiankun Gu. 2022. Firm internationalization and cost of equity: Evidence from China. *China Journal of Accounting Research* 15: 100237. [CrossRef]

Zamore, Stephen, Leif Atle Beisland, and Roy Mersland. 2019. Geographic diversification and credit risk in microfinance. *Journal of Banking & Finance* 109: 105665.