IJEM
International Journal of Economics and Management
Journal homepage: http://www.ijem.upm.edu.my

Managerial Ability and Stock Crash Risk in Indonesia: Financial Performance as A Mediator

MASYHURI HAMIDI[a*], FAJRI ADRIANTO[a], NANDA NANDA[b], EKO DWI PUTRA[a] AND AMER AZLAN ABDUL JAMAL[c]

[a]*Faculty of Economics and Business, Universitas Andalas, Indonesia*
[b]*Faculty of Economics and Business, Universitas Baiturrahmah, Indonesia*
[c]*Faculty of Business, Economics, and Accountancy, Universiti Malaysia Sabah, Malaysia*

ABSTRACT

Managerial ability is a key determinant of firm performance. As an emerging market, the Indonesian capital market presents investors with significant opportunities, though these are accompanied by considerable risks. This study examines the relationship between managerial ability and stock price crash risk, with financial performance as a mediating variable. We utilise a sample of firms listed on the Indonesia Stock Exchange from 2013 to 2023, specifically those included in the LQ45 index, comprising a final dataset of 810 firm-year observations. Our findings indicate varied outcomes when considering the characteristics of firms in Indonesia. One important finding is that the total effect of the relationship between managerial ability and stock price crash risk, mediated by financial performance, is more potent in non-family firms than in family firms. These findings provide investors with a deeper understanding of the characteristics of the Indonesian capital market. While the market offers considerable opportunities, it also presents potential risks for investors.

JEL Classification: G11, G12, M12, L25

Keywords: Capital market; emerging market; financial performance; manager ability; stock price crash risk

Article history:
Received: 25 April 2025
Accepted: 1 August 2025

[*] Corresponding author: Email: masyhurihamidi@eb.unand.ac.id
DOI: http://doi.org/10.47836/ijeam.19.2.07
© International Journal of Economics and Management. ISSN 1823-836X. e-ISSN 2600-9390.

INTRODUCTION

Stock prices play a pivotal role in the functioning and dynamics of capital markets. They serve as real-time indicators of a firm's perceived value and future prospects, reflecting the price at which its shares are traded on stock exchanges at any given moment. These prices are not static; rather, they fluctuate in response to a complex interplay of market forces, primarily driven by the dynamics of demand and supply among various capital market participants, including institutional investors, retail traders, analysts, and speculators. Factors such as corporate earnings, macroeconomic indicators, interest rates, geopolitical developments, and investor sentiment all contribute to shaping the expectations and behaviors of market participants, thereby influencing stock prices. In essence, stock prices serve as a fundamental indicator of shareholder wealth, as the maximization of shareholder value is frequently associated with an increase in the firm's stock price. At any given point, stock prices reflect investors' expectations of the firm's future cash flows, which are capitalized into present value through their investment decisions (Fama and French, 2015).

As an emerging market, the Indonesian capital market offers considerable investment opportunities, though it also entails significant risks (Adrianto and Hamidi, 2020). Gaining a comprehensive understanding of its structural characteristics, key components, and inherent challenges is essential for individuals seeking to invest or engage in academic research within this domain. The Indonesian capital market is selected as the object of this study due to its distinct characteristics compared to those commonly examined in prior research. Previous studies have primarily focused on capital markets in developed economies such as the United States and Europe, whereas the Indonesian capital market differs significantly in its structure and behaviour from these developed markets (Chae and Kim, 2020). Emerging markets possess distinct attributes that make them attractive and challenging for investors (Hamidi et al., 2024). These characteristics differ considerably from those of developed markets (Devianto et al., 2018; Hamidi and Adrianto, 2022; Sadalia et al., 2019), including investor behaviour, investor composition, information dissemination, regulations, and others (Chae and Kim, 2020). According to İpek (2021), one defining feature of emerging markets is their high growth potential, accompanied by equally high-risk potential.

One of the significant risks in the capital market is stock price crashes. A stock price crash, defined as an unexpected yet sharp decline in stock prices, is considered one of the primary concerns in the capital market. Such crashes often have detrimental effects on investor wealth and can lead to the bankruptcy of numerous firms (Shelih and Wang, 2024). Stock price crash risk, frequently highlighted as a significant issue in the capital market, refers to a sudden and severe drop in stock prices, which typically causes adverse impacts on investor wealth and contributes to the insolvency of many firms (İpek, 2021).

Liang et al. (2020) assert that stock price crash risk is partly driven by managerial motives to conceal damaging information from external parties, thereby increasing information asymmetry. Once the concealed negative news reaches a threshold and suddenly becomes available to the public, stock prices experience a sharp decline, directly resulting in a crash. Tang et al. (2022) and Nguyen and Nguyen (2024) document that this undermines investors' immediate interests, triggers further sell-offs, erodes the integrity of financial markets, and diminishes investor confidence.

Several determinants of stock price crashes identified in the literature include firm characteristics such as size, profitability, market value, investment, and other company-specific attributes (Liang et al., 2020). Furthermore, corporate governance mechanisms also influence stock prices. This is partly driven by managerial motives to intentionally conceal negative information from external parties intentionally, thereby increasing information asymmetry. When accumulated negative information reaches is suddenly revealed to the public, stock prices can plummet sharply, leading to a crash (Shelih and Wang, 2024). Stock price crashes erode investors' immediate interests, trigger further sell-offs, weaken the integrity of financial markets, and undermine investor confidence (Tang et al., 2022). Simultaneously, the economic risks buried in the plunging stock prices pose a significant threat to both the development of firms and the real economy of a nation (Hu et al., 2020).

Specific managerial characteristics may influence stock price crash risk which include psychological traits such as overconfidence, which can lead to cognitive biases. Such biases may result in poor decision-making or excessive risk-taking, as overconfident managers might deliberately conceal negative information from investors (Qiao et al., 2022). Both scenarios can contribute to stock price crashes. Chen et al. (2021)

document that the likelihood of higher stock price crash risk increases for CEOs who have faced significant challenges, as they are more inclined to accept risks associated with obscuring lousy news.

Managerial ability has been identified as a critical factor in shaping corporate policies and making strategic decisions, serving as the foundation for achieving superior firm performance (Heubeck, 2023; Vial, 2019). It enables managers to make better investment decisions by leveraging their deep understanding of the firm's operations (Phan et al., 2020). The assessment of managerial ability in managing corporate resources can be demonstrated through their capacity to drive productivity, efficiency, and firm performance outcomes (Herri, 2011; Ting et al., 2021). In small-scale firms, managerial ability enhances performance with minimal resources by effectively and efficiently utilising internal and external resources. Furthermore, this ability encompasses analysing current business trends, forecasting future developments, and navigating the economic environment (Park and Byun, 2022).

Based on previous studies, research that directly examines the relationship between managerial ability and stock price crash risk remains scarce, particularly in emerging markets. For instance, the study by Ting et al. (2021) analysed the impact of managerial ability on firm performance but did not extend the analysis to stock price risk. Additionally, prior studies have often overlooked the mediating role of financial performance, a crucial variable rarely explored in this context. For example, the study by Shelih and Wang (2024) employed financial constraint as a moderator. It fills a research gap in the existing literature, which has primarily focused on examining the relationship between managerial ability and stock price crash risk mediated by financial performance, specifically within the context of the Indonesian capital market.

The Upper Echelons Theory provides a perspective on the relationship between these variables. This theory examines how managerial cognitive biases influence stock price crash risk. Unlike previous studies that relied on agency theory, this research offers a distinct approach. While agency theory assumes that managerial ability enables managers to exploit their control over the firm for personal gains, potentially leading to stock price crashes, this study adopts a cognitive and behavioural perspective to explore the dynamics of this relationship.

REVIEW OF LITERATURE

Upper Echelon Theory

The Upper Echelons Theory, developed by Hambrick and Mason (1984), posits that an organisation's effective performance reflects the values held by its top leaders. Decisions made by top management can significantly impact the outcomes and practices of the firm, as the characteristics of the executives responsible for the overall management directly influence the results achieved by the organisation.

Focusing on the characteristics of top management provides a deeper understanding of a firm's or organisation's performance than merely considering top executives individually (Qiao et al., 2022)**.** Strategic choices often include behavioural components that reflect the idiosyncrasies of decision-makers. In Upper Echelons Theory, bounded rationality is the primary decision-making logic among executives (Dhir et al., 2023).

The Upper Echelons Theory posits that a manager's background characteristics influence an organisation's expected outcomes, planned choices, and performance levels. The heterogeneity of top managers' characteristics, such as age or career experience, can influence their decision-making in strategy formulation and organisational structure, which directly impacts the firm's strategic choices and overall performance. Furthermore, the Upper Echelons Theory emphasises the limitations of rationality, with leaders often making decisions based on their cognitive, social, and physiological characteristics (Ting et al., 2015).

Managerial ability is interpreted as the ability of a CEO or top management team to efficiently convert the company's resources (including capital, labour, and innovative assets) into revenue, profit, or firm value compared to its industry peers (Demerjian et al., 2012). Efficiency refers to using specific resources to generate higher profits or minimise resource utilisation for a given level of revenue. The efficient use of company resources is reflected in capital and labour investment decisions, revenue-generating activities, and/or cost-cutting initiatives (Anggraini and Sholihin, 2023).

Stock Price Crash

Since the stock market crash in 1987, researchers have conducted extensive studies on stock market crashes and proposed theories such as the Leverage Effect Hypothesis, Rational Bubble Hypothesis, Volatility Compensation Hypothesis, and Heterogeneity Investors Hypothesis. Among these, Campbell and Hentschel (1992) proposed the Volatility Compensation Hypothesis, which states that both good and bad news will increase stock price volatility and raise investor risks and returns, thereby lowering firms' stock prices. Therefore, no news is considered good news. According to the Heterogeneity Investors Hypothesis by Chen et al. (2000), bearish investors are more likely to encounter problems, and their bearish information cannot be fully reflected in stock prices, thus exacerbating crash risks in subsequent transactions. Meanwhile, the process of stock price decline can be further categorised into three types: the form of rise to fall, the form of slight decline to crash, and the form of a sudden crash. This theory still operates within the framework of efficient capital markets (Xie et al., 2023).

Based on the behavioural finance framework, searching for the causes of stock price crashes from the corporate management level has led to the well-known Negative Information Hiding Hypothesis proposal. According to this hypothesis, due to information asymmetry, management may conceal lousy news for various reasons, such as maximising compensation or job security (Li et al., 2023). When the accumulation of negative information reaches its peak, the company's stock price plummets without warning, resulting in a crash (Xie et al., 2023).

Liang et al. (2020) empirically analyse whether and how managerial overconfidence influences the risk of stock price crashes. The study employs multiple linear regression models, two-stage Heckman treatment effect procedures, fixed-effects models, and event studies to clarify the causal relationship between managerial overconfidence and crash risk. The research finds that companies with overconfident managers are more likely to experience stock price crashes in the future compared to companies with less overconfident managers. The effect of overconfidence on the risk of collapse is more potent in firms with low transparency, suggesting that the lack of clarity within the company facilitates the concealment of bad news by overconfident managers, which, in turn, increases the risk of stock price crashes.

Nguyen and Nguyen (2024) examine the impact of stock liquidity on stock price crash risk and the moderating role of institutional blockholders in the Vietnamese stock market. Crash risk is measured by the negative skewness coefficient of firm-specific weekly returns (NCSKEW). Liquidity is measured using the Amihud illiquidity-adjusted ratio. A two-stage least squares method is employed to address endogeneity issues. The study finds that crash risk increases with stock liquidity, and this relationship is more substantial in companies that institutional shareholders own. Furthermore, intensive selling by institutional shareholders in the future will positively moderate the relationship between liquidity and crash risk.

The study by Shelih and Wang (2024) empirically explores the impact of managerial ability on crash risk and the moderating effects of financial constraints on this relationship. The research tests the hypothesis using existing measures and methods from previous literature. The authors also conduct a robustness analysis to ensure the validity of the empirical results. The study finds that managerial ability can effectively mitigate crash risk. Additionally, financial constraints significantly weaken this relationship. Therefore, financial limitations are important in hindering managerial ability to prevent stock price crashes.

Financial Performance

Duric and Topler (2021) define firm performance as the extent to which an organisation or company can efficiently utilise its resources to produce outputs consistent with its objectives and relevant to its stakeholders. They emphasise that a company can achieve firm performance through management, economics, and marketing, with characteristics of competitiveness, efficiency, and effectiveness applied to the organisation and its components, both structurally and procedurally. Firm performance reflects how well a company focuses on achieving superior performance compared to its competitors. This advantage can be derived from operational excellence, revenue growth, and customer relationships.

Earlier studies have rarely explored the mediating role of financial performance in the relationship between managerial ability and stock price crash risk. Shelih and Wang (2024) found that managerial ability can effectively mitigate crash risk, however, financial constraints play a crucial role in limiting the extent to which managerial ability can prevent stock price crashes. Meanwhile, Thuy et al. (2021) investigated the relationship between corporate social responsibility (CSR) and stock price crash risk, with financial

performance as a mediating factor. Their empirical findings indicate that CSR disclosure can enhance a firm's financial performance and reduce the likelihood of stock price crashes.

According to Gao et al. (2023), firm performance can be measured using various proxies such as Return on Equity (ROE) and Return on Assets (ROA). Bhutta et al. (2021) show that managers with superior skills and experience are positively related to firm performance. Similarly, Ting et al. (2021) report a positive relationship between managerial ability and firm performance, though the positive impact diminishes in firms with high leverage levels. Furthermore, Gan (2019) reveals that competent managers are likelier to make profitable investment decisions than less competent managers.

Anggraini and Sholihin (2023) argue that managerial ability can drive earnings manipulation, suggesting that highly skilled managers may seize opportunities to engage in fraud and develop concealment tactics. Similarly, Demerjian et al. (2020) contend that managerial ability encourages earnings management. Gull et al. (2022) report similar findings regarding firms experiencing financial distress. They indicate that the tendency for earnings manipulation by highly skilled managers is triggered by the company's financial pressures to enhance equity compensation and reduce the burden of debt refinancing.

Demerjian et al. (2020) investigate (a) whether highly skilled managers are significantly more likely to engage in intentional earnings smoothing, (b) whether intentional smoothing is associated with improved future operational performance, and (c) whether intentional smoothing is more common when it benefits shareholders, managers, or both.

Overall, our testable hypotheses are as follows:

H1. Managerial ability has a positive and significant impact on stock price crash risk
H2. Managerial ability has a positive and significant impact on firm financial performance
H3. Firm performance has a positive and significant impact on stock price crash risk
H4. Firm performance positively and significantly mediates the relationship between managerial ability and stock price crash risk.

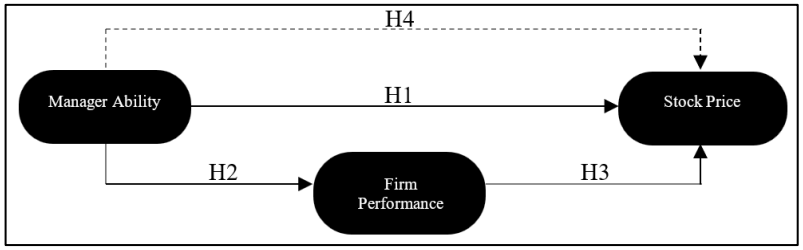

Figure 1 Research Framework

RESEARCH METHODOLOGY

The data type used is panel data with the population of LQ45 index companies listed on the Indonesia Stock Exchange (IDX) from 2013 to 2023. We collected data from two sources. First, we manually gathered data from the annual reports of listed companies. Second, we obtained all financial data from the Refinitiv Eikon database. Our final sample includes 810 firm-year observations. Following the common practice, we winsorise all continuous variables at the 1% and 99% levels.

The model specification of this study is as follows:

$$NCSKEW_{i,t} = \alpha_0 + \alpha_1 MA_{i,t} + \sum Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$ROA_{i,t} = \alpha_0 + \alpha_1 MA_{i,t} + \sum Controls_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$NCSKEW_{i,t} = \alpha_0 + \alpha_1 ROA_{i,t} + \sum Controls_{i,t} + \varepsilon_{i,t} \quad (3)$$

where $NCSKEW_{i,t}$ represents the stock price crash risk for firm-t in year-i. $MA_{i,t}$ denotes the managerial ability of firm-t in year-i. $ROA_{i,t}$ stands for the return on assets of firm-, t in year-i. $Controls_{i,t}$ represents the control variables for firm-t in year-i. $\varepsilon_{i,t}$ adalah error term.

Stock Price Crash Risk

Stock price crash risk, following Shelih and Wang (2024), this study uses two proxies for crash risk based on the firm-specific weekly returns ($W_{i,t}$), which are the residuals obtained from the following model:

$$R_{j,\tau} = \beta_0 + \beta_{1j}R_{m,\tau+2} + \beta_{2j}R_{m,\tau+1} + \beta_{3j}R_{m,\tau} + \beta_{4j}R_{m,\tau-1} + \beta_{5j}R_{m,\tau-2} + \varepsilon_{m,\tau+2} \quad (4)$$

where $R_{j,\tau}$ is the stock return of company j in week t, $R_{j,\tau}$ is the market return of the respective company in week t, and $\varepsilon_{j,\tau}$ is *the error term*. Then, the firm-specific weekly return for company i in week t ($W_{i,t}$) is calculated as the natural log of 1 plus the residual return from equation (1), that is, $W_{i,t}$ = ln (1+ $W_{i,t}$)

Our first proxy for crash risk is the negative conditional skewness of the firm-specific weekly returns (NCSKEW), represented as the inverse of the third moment of the firm-specific weekly returns over the standard deviation of the firm-specific weekly returns.

$$\text{NCSKEW}_{i,t} = \frac{-[n(n-1)^{\frac{3}{2}}\sum W_{i,\tau}^3]}{[(n-1)(n-2)\left(\sum W_{i,\tau}^2\right)^{\frac{3}{2}}]} \quad (5)$$

where i and t represent the company and year, respectively, a more considerable NCSKEW value indicates a higher likelihood of a stock price crash.

Managerial Ability

According to Demerjian et al. (2012), the proxy for managerial ability can be measured through a two-step process. First, the efficiency of a firm in managing its resources is assessed using Data Envelopment Analysis (DEA). For the factors of firm efficiency, this study uses seven factors (Ting et al., 2021), namely the number of employees (EMP); the cost of goods sold (COGS); operating expenses (OPEX); property, plant, and equipment (PPE); and goodwill and intangibles (GI) as inputs; and market value (MV) and sales (SALES) as outputs. The following is the equation form for the firm's efficiency function:

$$FE_t = (MV_t + SALES_t).(\delta_1 EMP_t + \delta_2 COGS_t + \delta_3 OPEX_t + \delta_4 PPE_t + \delta_2 GI_t)^{-1} \quad (6)$$

where FE_t is the firm's efficiency score for the current year, with a range of values from 0 to 1. δ_n is the standard deviation; EMP_t is the number of employees; $COGS_t$ is the cost of goods sold (COGS), which refers to the cost of production for goods or services required to sell the product to customers; $OPEX_t$ is operational expenses; PPE_t or fixed assets, refers to intangible assets used in the firm's operational activities (property, plant, and equipment); GI_t refers to goodwill and intangibles, which are the company's intangible assets; MV represents the firm's value based on market capitalisation, and $SALES$ represents the income generated from the sales of goods/services each year. In the first stage, this measures the firm's efficiency score regarding resource utilisation to generate sales revenue and market value.

In the second stage, according to Demerjian et al. (2012), a regression is performed on the firm's efficiency score after considering the firm's characteristics and efficiency. The unexplained residuals from the regression serve as a proxy for managerial ability (MA). The following is the specification of the model:

$$FE_{i,t} = \beta_0 + \beta_1 TA_{i,t} + \beta_2 MS_{i,t} + \beta_3 FCF_{i,t} + \beta_4 AGE_{i,t} + \beta_5 SEG_{i,t} + \beta_6 BSIZE_{i,t} + \varepsilon_{i,t} \quad (7)$$

where FE is the firm's efficiency score; TA is the total assets of the firm; MS is the firm's market share, which is the ratio of the firm's sales to industry sales; FCF is a dummy variable equal to 1 if the firm has positive free cash flow, and 0 if not; AGE is the firm's age since its establishment; SEG is the ratio of sales from business segments to total sales from all business segments the firm owns; $BSIZE$ is the number of directors on the firm's board; i, t represents firm-i in year-t; and ε is the proxy for managerial ability.

Financial Performance

ROA (Return on Asset) and ROE (Return on Equity) are proxies used for the firm's financial performance (Maury, 2022; Zhang and Chiu, 2023). ROA is calculated based on the percentage of net income divided by the firm's total assets in the current year. ROE is calculated based on the percentage of net income divided by

the firm's total equity in the current year. As an additional option for the firm's performance proxy, Tobin's Q can be used by calculating the ratio of market capitalisation and the book value of equity to the firm's total assets (Gull et al., 2022; Ting et al., 2021).

Control Variables

Several control variables (table 1) used in this study related to the measurement of managerial ability, firm financial performance, and stock price crash risk (Bhutta et al., 2021; Gull et al., 2022; Ting et al., 2021; Maury, 2022; Zhang and Chiu, 2023) include firm age (LnAGE), proportion of the largest shareholder (TOP1), proportion of independent directors measured by the number of independent directors divided by the total number of directors (INDE), leverage (LEV) measured by the ratio of total debt to total assets, operational revenue growth ratio (GOR), state-owned enterprises (SOE) for state-owned companies (valued as 1 if state-owned, 0 if not).

Table 1 Variable Definition

Variable	Definition
Dependent variables	
Stock Price Crash Risk (NCSKEW)	Negative conditional skewness of firm-specific weekly return (Shelih and Wang, 2024)
Mediation variable	
Return on Asset (ROA)	Net earnings divided by total assets (Maury, 2022; Zhang and Chiu, 2023)
Return on Asset (ROE)	Net earnings divided by total equity (Maury, 2022; Zhang and Chiu, 2023)
Tobin's Q (TQ)	The ratio of the sum of market capitalisation and the book value of shareholders' equity divided by total assets (Gull et al., 2022)
Independent variables	
First step: firm efficiency	
Number of Employees (EMP)	Number of Employees (Ting et al., 2021)
The cost of goods sold (COGS)	Cost of goods sold by the firm (Ting et al., 2021)
Operating expenses (OPEX)	Operating expenses, comprising selling, general, and administrative expenses (Ting et al., 2021)
Property, plant, and equipment (PPE)	Fixed assets: tangible assets that a company holds for use in its operations to generate revenue (Ting et al., 2021)
Goodwill and intangibles (GI)	Goodwill and intangibles (Ting et al., 2021)
Market-based value (MV)	Market Capitalisation: Outstanding shares multiplied by market price (Ting et al., 2021)
Sales (SALES)	Revenues generated from sales of goods and services (Ting et al., 2021)
Second step: managerial ability	
Firm efficiency (FE)	Firm efficiency score from residual-base concept (Ting et al., 2021)
Firm size (TA)	Total assets of the firm (Ting et al., 2021)
Market share (MS)	The ratio of a firm's sales to the overall sales of the industry by year (Ting et al., 2021)
Free cash flow (FCF)	The dummy variable is equal to "1" if a firm has a positive free cash flow and '0" otherwise (Ting et al., 2021)
Firm age (AGE)	The number of years the firm has existed (Ting et al., 2021)
Business segments (SEG)	The ratio of a firm's business segment's sales to its total sales across all business segments (Ting et al., 2021)
Board size (BSIZE)	The number of directors on board (Ting et al., 2021)
Control variables	
Firm age (FAGE)	The number of years the firm has existed (Ting et al., 2021)
Top 1 shareholder (TOP)	The proportion of the largest shareholder (Zhang et al., 2023)
Independent Director (INDE)	The number of independent directors divided by the number of directors (Ting et al., 2021)
Leverage (LEV)	The ratio of total assets to liabilities (Zhang et al., 2023)
State-owned enterprises (SOE)	A dummy variable (if it is state-owned, this variable is '1';0 otherwise) (Zhang et al., 2023)
Operating revenue growth rate (GOR)	The growth rate of the firm's operation revenue (Zhang et al., 2023)

RESULTS AND DISCUSSION

Descriptive Statistics of Variables Table

Table 2 presents the descriptive statistics of the study. The mean value of NCSKEW is 1.363. The maximum and minimum values of NCSKEW are -2.556 and 6.823, respectively. The mean value of MA is 0.000, while the maximum and minimum values are -1.883 and 96.240, respectively, indicating a significant variation in MA.

Table 2 Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
NCSKEW	671	1.363	1.319	-2.556	6.823
MA	891	0.000	3.829	-1.883	96.240
ROA	891	0.062	0.103	-0.644	1.523
LnAGE	891	3.537	0.559	1.386	4.852
TOP1	891	0.539	0.182	0.000	1.000
INDE	891	0.493	0.509	0.000	2.000
LEV	891	0.585	0.242	0.069	1.875
SOE	891	0.265	0.442	0.000	1.000
GOR	810	0.197	2.386	-0.982	66.842

Baseline Regression

Table 3 presents the baseline findings for the testable hypotheses using panel data regression. Following the classical assumption testing, the presence of heteroscedasticity indicated that the model failed to satisfy the assumptions of the Best Linear Unbiased Estimator (BLUE), thereby compromising the efficiency of the estimation. The Generalized Least Squares (GLS) approach was adopted to address this issue, as it provides consistent and efficient estimates by correcting for heteroscedasticity inherent in the PLS model. We report the results for the regression model specification of MA on NCSKEW using GLS regression model in column (1), the relationship between MA and ROA using the Random Effect Model in column (2), and ROA on NCSKEW using the GLS regression model in column (3).

Our findings indicate that the coefficients of MA and ROA are positive but not statistically significant. These results do not support hypotheses H1, H2, and H3 and are inconsistent with prior studies by Shelih and Wang (2024); Heubeck (2023); Vial (2019); Bhutta et al. (2021); Ting et al. (2021). We further conducted robustness tests to examine the consistency of the baseline regressions.

Table 3 Baseline regression

	(1)	(2)	(3)
	NCSKEW	ROA	NCSKEW
MA	(0.036)	(0.001)	
	0.000	0.000	
ROA			(0.599)
			0.845
LnAGE	(0.112)	(0.0122)	(0.111)
	0.076	0.011	0.070
TOP1	(0.314)	(0.030)	(0.320)
	0.045	0.025	-0.045
INDE	(0.112)	(0.007)	(0.111)
	-0.064	0.002	-0.057
LEV	(0.265)	(0.0219)***	(0.272)
	0.230	-0.168	0.322
SOE	(0.133)	(0.016)	(0.133)
	0.132	-0.008	0.147
GOR	(0.212)**	(0.001)	(0.213)**
	0.466	0.002	0.428
_cons	(0.454)*	(0.0482)**	(0.448)*
	0.877	0.107	0.836
Hausman Test		0.381	
LM Test	0.368		0.477
Breusch Pagan Test	0.001		0.001
Mean VIF	1.090	1.100	1.120
No. of Observation	610	810	610
R2	0.015	0.146	0.018
Adj.R2	0.003	0.139	0.006
F-Stat.	0.250	0.000	0.137

Notes: *,**,***Significant 10, 5 and 1 per cent levels, respectively. Standard error in the parenthesis. This table reports the PLS regression results of the direct effect of MA on NCSKEW, the direct effect of MA on ROA, and the direct effect of MA on NCSKEW.

Robustness Check

The results in Table 3 indicate that MA has no effect on NCSKEW, MA has no effect on ROA, and ROA has no effect on NCSKEW. However, these findings may be driven by unobserved omitted variables influencing these relationships simultaneously. Therefore, we include firm and year-fixed effects in Equations (1), (2), and (3) to control for unobservable firm characteristics, as suggested by Demerjian et al. (2012).

Table 4 presents the results of the fixed effects regression. Columns (1), (2), and (3) incorporate firm and year fixed effects. Across all specifications, the robustness test results remain consistent with the baseline findings.

Table 4 Robustness check

	(1)	(2)	(3)
	NCSKEW	ROA	NCSKEW
MA	(0.060)	(0.001)	
	0.000	0.000	
ROA			(0.662)
			-0.187
LnAGE	(0.920)	(0.046)	(0.899)
	0.166	0.035	0.169
TOP1	(0.740)	(0.043)	(0.733)
	1.162	-0.031	1.148
INDE	(0.157)	(0.009)	(0.157)
	0.099	-0.003	0.097
LEV	(0.740)	(0.030)***	(0.729)
	-0.662	-0.183	-0.683
SOE	(0.670)	(0.050)	(0.748)
	0.609	0.040	0.588
GOR	(0.199)***	(0.001)	(0.203)***
	0.597	0.002	0.608
_cons	(3.133)	(0.159)	(3.044)
	-0.410	0.044	-0.389
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Mean VIF	1.090	1.100	1.120
No. of Observation	610	810	610
R2	0.015	0.146	0.018
Adj.R2	0.003	0.139	0.006
F-Stat.	0.250	0.000	0.000

Notes: *,**,***Significant 10, 5 and 1 per cent levels, respectively. Standard error in the parenthesis. This table reports the PLS regression results, controlling for the additional firm fixed effect and year fixed effect.

Mediation Effect

Table 5 shows that the mediating effect of ROA is positive but not significant. We further investigate the mediating mechanism using financial performance proxies, following Ting et al. (2021), who suggest that firm performance can be measured using Tobin's Q and ROE.

The analysis results in Table 5 indicate that Sobel tests for all financial performance proxies ROA, ROE, and Tobin's Q as mediating variables are insignificant. These findings do not support hypothesis H4, as firm performance does not mediate the relationship between managerial ability and stock price crash risk positively and significantly. These results are inconsistent with the findings of Shelih and Wang (2024).

Additionally, our findings on the direct effect of MA on Tobin's Q are positive and significant at the 1%, 5%, or 10% levels. This aligns with Demerjian et al. (2012), suggesting that managerial ability can enhance firm value. As noted by (Fama and French, 2015), stock price reflects a firm's value (Fama and French, 2015).

Heterogeneity Analysis

Shelih and Wang (2024) suggest that managerial ability does not affect stock price crash risk in firms with financial constraints. We attempt to assess the impact of managerial ability on stock price crash risk by focusing on the specifications of state-owned enterprises (SOEs) that are already sustainable and firm characteristics based on family ownership structure.

In Table 6, we find that the direct effect of MA on ROA is positive and significant at the 1% and 5% levels in the sample groups of SOEs and family-owned firms. The impact of managerial ability on firm performance is more pronounced in family-owned firms. These findings remain consistent with Demerjian et al. (2012). However, ROA does not mediate the relationship between MA and NCSKEW in the sample groups of SOEs and non-SOEs.

In contrast, our findings for the non-family firm group reveal that the Sobel test results identify ROA as a mediating variable with a suppressor effect. A suppressor effect explains why initial results may appear insignificant or weak in the preliminary analysis but become significant once the suppressor variable is accounted for. This effect provides a more accurate explanation of the relationships among variables and

uncovers hidden mechanisms within the data (Paulhus et al., 2004). As shown in Table 6, ROA mediates the relationship between MA and NCSKEW in the non-family firm group. The intermediary effect of ROA is 68%, significant at the 5% level, and positive, as the confidence interval falls within a favourable range ([0.005, 0.051]). Our findings indicate that the moderating effect of ROA strengthens the relationship between managerial ability and stock price crash risk, with the mediation effect being more pronounced in the non-family firm group.

Table 5 Mediation effect

	(1) Mediating Effect: ROA			(2) Mediating Effect: ROE			(3) Mediating Effect: TQ		
	NCSKEW	ROA	NCSKEW	NCSKEW	ROE	NCSKEW	NCSKEW	TQ	NCSKEW
MA	(0.036)	(0.001)		(0.036)	(0.009)		(0.036)	(0.019)***	
	0.000	0.000		0.000	0.004		0.000	0.261	
ROA			(0.599)						
			0.845						
ROE						(0.109)			
						0.058			
TQ									(0.025)
									0.028
LnAGE	(0.112)	(0.0122)	(0.111)	(0.112)	(0.097)	(0.111)	(0.112)	(0.140)***	(0.112)
	0.076	0.011	0.070	0.076	0.118	0.074	0.076	0.502	0.060
TOP1	(0.314)	(0.030)	(0.320)	(0.314)	(0.269)	(0.315)	(0.314)	(0.420)***	(0.327)
	0.045	0.025	-0.045	0.045	0.225	0.030	0.045	2.394	-0.059
INDE	(0.112)	(0.007)	(0.111)	(0.112)	(0.074)	(0.112)	(0.112)	(0.149)	(0.111)
	-0.064	0.002	-0.057	-0.064	-0.059	-0.059	-0.064	0.031	-0.066
LEV	(0.265)	(0.0219)***	(0.272)	(0.265)	(0.198)***	(0.266)	(0.265)	(0.318)***	(0.273)
	0.230	-0.168	0.322	0.230	0.641	0.212	0.230	-2.996	0.308
SOE	(0.133)	(0.016)	(0.133)	(0.133)	(0.127)**	(0.133)	(0.133)	(0.186)***	(0.135)
	0.132	-0.008	0.147	0.132	-0.304	0.140	0.132	-1.088	0.160
GOR	(0.212)**	(0.001)	(0.213)**	(0.212)**	(0.014)	(0.212)**	(0.212)**	(0.031)	(0.212)**
	0.466	0.002	0.428	0.466	-0.013	0.464	0.466	-0.005	0.469
_cons	(0.454)*	(0.0482)**	(0.448)*	(0.454)*	(0.394)	(0.448)**	(0.454)*	(0.582)	(0.448)**
	0.877	0.107	0.836	0.877	-0.610	0.888	0.877	0.744	0.892
Hausman Test		0.381			0.110			0.002	
LM Test	0.368		0.477	0.368		0.394	0.368		0.414
Breusch Pagan Test	0.001		0.001	0.001		0.001	0.001		0.000
Wald Test					0.000			0.000	
Mean VIF	1.090	1.100	1.120	1.090	1.100	1.090	1.090	1.100	1.120
No. of Observation	610	810	610	610	810	610	610	810	610
R2	0.015	0.146	0.018	0.015	0.024	0.017	0.015	0.341	0.017
Adj.R2	0.003	0.139	0.006	0.003	0.021	0.005	0.003	0.335	0.005
F-Stat.	0.250	0.000	0.137	0.250	15.480	9.320	0.250	0.000	0.171
Sobel			0.006(z=1.412)			0.004(z=0.673)			0.008(z=0.394)
Mediating Effect			0.80%			0.20%			0.80%
The ratio of indirect to direct effects			0.008			0.002			0.008

Notes: *,**,***Significant 10, 5 and 1 per cent levels, respectively. Standard error in the parenthesis. This table reports the PLS regression results of the effect of MA on NCSKEW and the mediating effect of financial performance (ROA, ROE, and TQ). We also use the Bootstrap method to test the mediating mechanism.

Table 6 Heterogeneity analysis

	(1) SOE			(2) Non-SOE			(3) Family Firm			(4) Non-Family Firm		
	Mediating Effect: ROA			Mediating Effect: ROA			Mediating Effect: ROA			Mediating Effect: ROA		
	NCSKEW	ROA	NCSKEW	NCSKEW	ROA	NCSKEW	NCSKEW	ROA	NCSKEW	NCSKEW	ROA	NCSKEW
MA	(0.181)	(0.009)***		(0.036)	(0.001)		(0.072)	(0.006)**		(0.042)	(0.001)	
	0.024	0.027		-0.003	0.000		0.019	0.012	(0.004)**	-0.004	0.000	
ROA			(2.571)			(0.616)			0.010			(0.887)
			2.950			0.847						1.035
LnAGE	(0.232)**	(0.012)	(0.231)***	(0.135)	(0.017)	(0.134)	(0.190)	(0.018)	(0.013)	(0.152)	(0.016)	(0.151)
	0.562	-0.009	0.619	-0.040	0.018	-0.059	-0.108	-0.008	-0.006	0.182	0.009	0.166
TOP1	(1.302)	(0.058)	(1.284)	(0.323)	(0.035)	(0.330)	(0.583)	(0.048)	(0.036)*	(0.382)	(0.037)	(0.401)
	0.600	0.031	0.636	0.047	0.019	-0.056	-0.269	0.056	0.067	0.350	0.010	0.201
INDE	(0.284)	(0.013)	(0.279)	(0.129)	(0.008)	(0.128)	(0.183)	(0.012)	(0.012)	(0.141)	(0.008)**	(0.141)
	-0.375	0.004	-0.379	-0.001	0.003	0.001	0.049	-0.019	-0.019	-0.107	0.016	-0.111
LEV	(0.695)	(0.030)***	(0.790)	(0.300)	(0.027)***	(0.303)	(0.470)***	(0.035)***	(0.026)***	(0.312)	(0.026)***	(0.344)
	-0.365	-0.218	0.095	0.357	-0.143	0.427	1.184	-0.109	-0.116	-0.245	-0.218	-0.072
GOR	(0.467)	(0.012)***	(0.485)	(0.238)**	(0.001)	(0.238)*	(0.298)	(0.019)***	(0.019)***	(0.298)***	(0.001)*	(0.300)***
	0.323	0.047	0.164	0.498	0.002	0.462	-0.093	0.065	0.059	1.037	0.002	0.994
_cons	(1.095)	(0.063)***	(1.148)	(0.570)**	(0.065)	(0.562)**	(0.885)	(0.074)*	(0.054)**	(0.576)	(0.063)**	(0.574)
	-0.658	0.207	-1.329	1.180	0.072	1.208	1.072	0.129	0.122	0.649	0.146	0.631
Hausman Test		0.117			0.278			0.887			0.221	
LM Test	1.000		1.000	0.215		0.318	0.342		0.339	1.000		1.000
Breusch Pagan Test	0.085		0.232	0.006		0.004	0.967		0.997	0.000		0.000
Mean VIF	1.330	1.210	1.510	1.050	1.050	1.080	1.170	1.120	1.070	1.060	1.040	1.170
No. of Observation	160	215	160	450	595	450	240	312	312	370	498	370
R2	0.054	0.343	0.062	0.014	0.122	0.018	0.039	0.142	0.141	0.042	0.178	0.050
Adj.R2	0.017	0.339	0.025	0.000	0.107	0.005	0.014	0.122	0.125	0.026	0.166	0.032
F-Stat.	0.200	0.324	0.130	0.393	0.000	0.225	0.156	0.000	0.000	0.013	0.000	0.008
Sobel	0.016(z=-0.094)			0.006(z=1.272)			0.002(z=-0.217)			0.012**(z=2.372)		
Mediating Effect	1.7%			0.80%			1 %			68%		
The ratio of indirect to direct effects	0.017			0.008			0.010			0.680		

Notes: *,**,***Significant 10, 5 and 1 per cent levels, respectively. Standard error in the parenthesis. This table presents the PLS regression results, considering firm heterogeneity based on State-owned enterprise (SOE) and family firm classifications. We also use the Bootstrap method to test the mediating mechanism.

CONCLUSIONS

We examine the impact of managerial ability (MA) on stock price crash risk, with financial performance serving as an intermediary effect. The firms included in our analysis consist of companies listed on the Indonesia Stock Exchange (IDX) and indexed in LQ45. Various proxies for financial performance were utilised, and our findings highlight from the Sobel test (Table 5) that the mediating role of financial performance does not have a statistically significant effect on the relationship between managerial ability and stock price crash risk.

Furthermore, we also account for firm characteristics by classifying companies into specific groups. Our results indicate that for state-owned enterprises (SOEs) and family firms, the effect of managerial ability is more pronounced in achieving higher firm performance. Furthermore, our findings reveal that the total effect of the relationship between managerial ability and stock price crash risk, mediated by financial performance, is stronger in the non-family firm sample group than in the family firm sample group. This occurs because family firms tend to have higher control by majority shareholders (the family), which may reduce external pressure on management to optimise financial performance. In contrast, non-family firms generally have a more dispersed ownership structure, making managers more accountable to external investors, thereby amplifying the impact of managerial ability on financial performance and, ultimately, stock price crash risk. Our findings on the impact of managerial ownership and business risk on financial performance and stock prices provide additional insights into understanding these dynamics in the context of firms in Indonesia.

Our findings have important implications for the Financial Services Authority of Indonesia (OJK) in refining corporate governance policies in line with upper echelons theory, particularly by strengthening the implementation of more rigorous fit and proper tests for strategic managerial positions. Additionally, OJK could mandate periodic disclosures regarding top management's qualifications, experience, and performance. Furthermore, OJK may consider developing a Managerial Ability Index based on quantitative and qualitative metrics similar to ESG ratings to enhance corporate transparency for investors and the public. This index could serve multiple purposes: (1) classifying firms based on their potential risk levels and (2) providing a reliable reference for institutional investment decision-making. By identifying firms with low managerial ability, regulators would be better positioned to undertake early preventive interventions, which are crucial for minimising potential market shocks triggered by sudden stock price crashes and enhancing the overall stability of the capital market. Finally, regulators could incentivise firms demonstrating strong managerial capability and low crash risk. These incentives include reduced listing fees, free access to executive education programs, or priority placement in government-supported advisory initiatives.

Our findings are expected to serve as a valuable reference for future researchers investigating stock price crash risk about managerial ability, particularly within the framework of upper echelons theory in emerging markets. This study offers opportunities for further development in corporate governance, asset pricing, strategic finance, and sustainable development, as well as through theoretical lenses such as the Resource-Based View (RBV) and agency theory. These avenues are particularly relevant in exploring the relationship between managerial ability and stock price crash risk. Furthermore, these findings enhance investors' understanding when trading stocks, enabling them to anticipate the risk of stock price crashes better.

Additionally, our findings are anticipated to enrich the literature on stock price crash risk, especially concerning managerial ability. Specifically, within the context of upper echelons theory in emerging markets, this study provides insights into how managerial ability impacts stock price crash risk. This understanding can help investors better assess and anticipate potential risks associated with stock price declines.

ACKNOWLEDGEMENT

The authors gratefully acknowledge the support provided by Universitas Andalas.

REFERENCES

Adrianto, F., & Hamidi, M. (2020). Analysis of Retail Investment Behaviour in Indonesian Stock Market. *Academy of Accounting and Financial Studies Journal*, *24*, 1-13.

Anggraini, P. G., & Sholihin, M. (2023). What do we know about managerial ability? A systematic literature review. *Management Review Quarterly*, *73*(1), 1–30. https://doi.org/10.1007/s11301-021-00229-6

Campbell, J. Y., & Hentschel, L. (1992). No news is good news. An asymmetric model of changing volatility in stock returns. *Journal of Financial Economics*, *31*(3), 281–318. https://doi.org/10.1016/0304-405X(92)90037-X

Chae, J., & Kim, R. (2020). Contrarian profits of the firm-specific component on stock returns. *Pacific Basin Finance Journal*, *61*, 101176. https://doi.org/10.1016/j.pacfin.2019.101176

Chen, J., Hong, H., & Stein, J. C. (2000). Forecasting crashes: trading volume, past returns and conditional skewness in stock prices. *Journal of Financial Economics*, *61*(3), 345-381.

Chen, Y., Fan, Q., Yang, X., & Zolotoy, L. (2021). CEO early-life disaster experience and stock price crash risk. *Journal of Corporate Finance*, *68*, 101928. https://doi.org/10.1016/j.jcorpfin.2021.101928

Demerjian, P. R., Lewis, M. F., Lev, B. I., & McVay, S. E. (2012). Managerial Ability and Earnings Quality. *SSRN Electronic Journal*, (March). https://doi.org/10.2139/ssrn.1650309

Demerjian, P., Lev, B., & McVay, S. (2012). Quantifying managerial ability: A new measure and validity tests. *Management Science*, *58*(7), 1229–1248. https://doi.org/10.1287/mnsc.1110.1487

Demerjian, P., Lewis-Western, M., & McVay, S. (2020). How Does Intentional Earnings Smoothing Vary With Managerial Ability? *Journal of Accounting, Auditing and Finance*, *35*(2), 406–437. https://doi.org/10.1177/0148558X17748405

Devianto, D., Maiyastri, Randy, Hamidi, M., Maryati, S., & Wirahadi Ahmad, A. (2018). Efficiency Analysis of Optimal Portfolio Selection for Stocks in LQ45 Index. *Proceedings of ICAITI 2018 - 1st International Conference on Applied Information Technology and Innovation: Toward A New Paradigm for the Design of Assistive Technology in Smart Home Care*, 78–83. https://doi.org/10.1109/ICAITI.2018.8686713

Dhir, A., Khan, S. J., Islam, N., Ractham, P., & Meenakshi, N. (2023). Drivers of sustainable business model innovations. An upper echelon theory perspective. *Technological Forecasting and Social Change*, *191*(March), 122409. https://doi.org/10.1016/j.techfore.2023.122409

Duric, Z., & Potočnik Topler, J. (2021). The role of performance and environmental sustainability indicators in hotel competitiveness. *Sustainability*, *13*(12), 6574. https://doi.org/10.3390/su13126574

Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model $. *Journal of Financial Economics*, *116*(1), 1–22. https://doi.org/10.1016/j.jfineco.2014.10.010

Gao, Z., Hua, M., Liu, H., & Yan, C. (2023). News sentiment and CEO retirement: The impact on firm performance and risk. *Research in International Business and Finance*, *66*, 102031. https://doi.org/10.1016/j.ribaf.2023.102031

Gull, A. A., Atif, M., Ahsan, T., & Derouiche, I. (2022). Does waste management affect firm performance? International evidence. *Economic Modelling*, *114*, 1–45. https://doi.org/10.1016/j.econmod.2022.105932

Hambrick, D. C., & Mason, P. A. (1984). Upper Echelons : of Reflection The organisation reflects its top managers. *Management*, *9*(2), 193–206.

Hamidi, M., & Adrianto, F. (2022). Government officers: Do they have a better retirement planning? *Kasetsart Journal of Social Sciences*, *43*, 645–652.

Hamidi, M., Adrianto, F., Nanda, N., Putra, E. D., & Jamal, A. A. A. (2024). Intraday Return Of Winners Vs Losers Indonesian Capital Market Evidence. *International Journal of Business and Society*, *25*(2), 773–788. https://doi.org/https://doi.org/10.33736/ijbs.7630.2024

Herri, H. (2011). Firms Performance And Top Management Characteristics In Indonesia. *International Business & Economics Research Journal (IBER)*, *10*(8), 15-22. https://doi.org/10.19030/iber.v10i8.5374

Heubeck, T. (2023). Managerial capabilities as facilitators of digital transformation? Dynamic managerial capabilities as antecedents to digital business model transformation and firm performance. *Digital Business*, *3*(1), 100053. https://doi.org/10.1016/j.digbus.2023.100053

Hu, J., Li, S., Taboada, A. G., & Zhang, F. (2020). Corporate board reforms around the world and stock price crash risk. *Journal of Corporate Finance*, *62*, 101557. https://doi.org/10.1016/j.jcorpfin.2020.101557

Inam Bhutta, A., Sheikh, M. F., Munir, A., Naz, A., & Saif, I. (2021a). Managerial ability and firm performance: Evidence from an emerging market. *Cogent Business and Management*, *8*(1), 1879449. https://doi.org/10.1080/23311975.2021.1879449

İpek, İ. (2021). The relevance of international marketing strategy to emerging-market exporting firms: from a systematic review towards a conceptual framework. *International Marketing Review, 38(2), 205-248.* https://doi.org/10.1108/IMR-02-2020-0017

Li, M., Shen, C., & Wen, M. (2023). The Effect of Firm-Specific Environmental Punishment on Stock Price Crash Risk: Evidence From China. *SAGE Open*, *13*(4), 1–19. https://doi.org/10.1177/21582440231199871

Liang, Q., Ling, L., Tang, J., Zeng, H., & Zhuang, M. (2020). Managerial overconfidence, firm transparency, and stock price crash risk: Evidence from an emerging market. *China Finance Review International*, *10*(3), 271–296. https://doi.org/10.1108/CFRI-01-2019-0007

Maury, B. (2022). Strategic CSR and firm performance: The role of prospector and growth strategies. *Journal of Economics and Business*, *118*, 106031. https://doi.org/10.1016/j.jeconbus.2021.106031

Nguyen, H. T., & Nguyen, H. T. N. (2024). Stock price crash risk, liquidity and institutional blockholders: evidence from Vietnam. *Journal of Economics and Development*, *26*(3), 174-188. https://doi.org/10.1108/JED-09-2023-0177

Park, W., & Byun, C. G. (2022). *Effect of Managerial Compensation and Ability on the Relationship between Business Strategy and Firm Value: For Small and Medium-Sized Enterprises (SMEs)*. *Sustainability*, *14*(8), 4689. https://doi.org/10.3390/su14084689

Paulhus, D. L., Robins, R. W., Trzesniewski, K. H., & Tracy, J. L. (2004). Two Replicable Suppressor Situations in Personality Research. *Multivariate Behavioral Research*, *39*(2), 301–326.

Phan, D. H. B., Tran, V. T., Nguyen, D. T., & Le, A. (2020). The importance of managerial ability on crude oil price uncertainty-firm performance relationship. *Energy Economics*, *88*, 104778. https://doi.org/10.1016/j.eneco.2020.104778

Qiao, L., Adegbite, E., & Nguyen, T. H. (2022). Chief financial officer overconfidence and stock price crash risk. *International Review of Financial Analysis*, *84*, 102364. https://doi.org/10.1016/j.irfa.2022.102364

Sadalia, I., Irawati, N., Hamidi, M., & Yuliana, S. (2019). HOW THE FINANCIAL OPENNESS ACCELERATES THE ECONOMIC GROWTH OF LEADING ASEAN ECONOMIES. *Journal of Security & Sustainability Issues*, *9*(2). Retrieved from http://www.iea.org/publications/free_new_Desc.asp?PUBS_ID=1883

Shelih, R., & Wang, L. (2024). The moderating effect of financial constraints on the relationship between stock price crash risk and managerial ability. *International Journal of Accounting and Information Management*, *32*(1), 122–146. https://doi.org/10.1108/IJAIM-03-2023-0065

Tang, L., Huang, Y., Liu, J., & Wan, X. (2022). Cost stickiness and stock price crash risk: Evidence from China. *Emerging Markets Finance and Trade*, 58(2), 544-569.

Thuy, C. T. M., Trung, T. Q., Khuong, N. V., & Liem, N. T. (2021). From corporate social responsibility to stock price crash risk: modelling the mediating role of firm performance in an emerging market. *Sustainability*, *13*(22), 12557.

Ting, I. W. K., Azizan, N. A. B., & Kweh, Q. L. (2015). Upper Echelon Theory Revisited: The Relationship between CEO Personal Characteristics and Financial Leverage Decision. *Procedia - Social and Behavioral Sciences*, *195*, 686–694. https://doi.org/10.1016/j.sbspro.2015.06.276

Ting, I. W. K., Tebourbi, I., Lu, W. M., & Kweh, Q. L. (2021). The effects of managerial ability on firm performance and the mediating role of capital structure: evidence from Taiwan. *Financial Innovation*, *7*, 1-23. https://doi.org/10.1186/s40854-021-00320-7

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, *28*(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Xie, Z., Yang, M., & Xu, F. (2023). Carbon emission trading system and stock price crash risk of heavily polluting listed companies in China: based on analyst coverage mechanism. *Financial Innovation*, *9*(1), 71. https://doi.org/10.1186/s40854-023-00475-5

Zhang, W., Lu, C., & Liang, S. (2023). More words but less investment: Rookie CEOs and firms' digital transformations. *China Journal of Accounting Research*, *16*(3), 100305. https://doi.org/10.1016/j.cjar.2023.100305

Zhang, Wenwen, & Chiu, Y. Bin. (2023). Country risks, government subsidies, and Chinese renewable energy firm performance: New evidence from a quantile regression. *Energy Economics*, *119*, 106540. https://doi.org/10.1016/j.eneco.2023.106540