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The Moderating Effect of Family Ownership on Earnings Management and Stock Price Crash Risk

Aswin Parmita Sakti, Arief Wibisono Lubis

Department of Management, Faculty of Economics and Business, Universitas Indonesia
Jl. Prof. Dr. Sumitro Djojohadikusumo UI Depok, Jawa Barat 16424, Indonesia

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ABSTRACT

This study examines the influence of earnings management on stock price crash risk within publicly listed companies in Indonesia. Additionally, it explores the moderating role of family ownership in this relationship, assessing whether it strengthens or weakens the connection between earnings management and stock price crash risk. The research employs an unbalanced panel data regression framework, utilizing dynamic panel data estimation through the system-GMM approach. Empirical findings indicate that accrual-based earnings management significantly increases stock price crash risk, whereas real earnings management exerts only a marginal positive effect on crash risk. Furthermore, results suggest that family ownership amplifies the impact of accrual-based earnings management on stock price crash risk, implying that firms with family ownership engage in more aggressive earnings manipulation practices, which in turn heighten the probability of future stock price crashes.

Corresponding author:
aswinsakti@gmail.com

SARI PATI

Studi ini meneliti bagaimana manajemen laba mempengaruhi risiko jatuhnya harga saham di perusahaan terbuka di Indonesia. Penelitian ini juga menyelidiki apakah kepemilikan keluarga memainkan peran moderasi dalam hubungan antara manajemen laba dan risiko jatuhnya harga saham, menguji apakah memperkuat memperlemah hubungan antara kedua variabel ini. Penelitian ini menggunakan regresi unbalanced panel data dengan metode estimasi data panel dinamis menggunakan sistem-GMM. Temuan menunjukkan bahwa manajemen laba akrual memiliki efek positif yang signifikan pada risiko jatuhnya harga saham, sedangkan manajemen laba riil memiliki efek positif yang tidak signifikan pada risiko jatuhnya harga saham. Hasil penelitian juga membuktikan bahwa kepemilikan keluarga meningkatkan dampak manajemen laba akrual pada risiko jatuhnya harga saham, menunjukkan bahwa kepemilikan keluarga berkorelasi dengan praktik manajemen laba yang lebih agresif, sehingga meningkatkan kemungkinan jatuhnya harga saham di masa depan.

INTRODUCTION

The earnings management phenomenon still occurs today, and on a global scale, financial scandals occur in large world companies such as: Enron, Worldcom, Olympus, Parmalat, and Toshiba (Nguyen et al., 2024). In Indonesia, there are similar cases including: PT Indofarma (2001), PT Kimia Farma (2001), PT Bank Lippo (2002), KAI (2005), PT Hanson International (2016), PT Asuransi Jiwasraya (2017), and PT Envy Technologies Indonesia (2019) (Sandria, 2021). In 2023, there were allegations of financial report manipulation by two state-owned enterprises, namely, Wijaya Karya and Waskita Karya, which allegedly understated debt costs, thus affecting reported profits. Financial reports may be less transparent when earnings management occurs, ultimately misleading stakeholders with an inaccurate portrayal of a company's operational and financial standing. Studies conducted by Ball and Brown (1968) found that the financial data disclosed in a companies financial reports considerably impact its stock price. As a result, manipulated financial statements can make a company appear more successful, leading to increased stock prices. Influence can impact investor behavior when making decisions about buying or selling shares, thereby affecting a company's stock price traded on the stock exchange (Bhutto et al., 2021).

Research conducted by Hsu et al. (2022) also discovered that the actions of managers who engage in earnings manipulation by camouflaging negative information about a company's performance from the public lead investors to overvalue the company. Public awareness of unfavorable news can lead to a decline in a company's stock value. Delayed disclosure of negative information by management can lead to the company's valuation, rendering investment analysis conducted by investors obsolete. According to (Hutton et al., 2009), managers systematically withhold negative information about a company from the public, and when this information is revealed, the stock price suddenly falls. Earnings manipulation has substantial consequences on stock price crash risk, particularly in nations with inadequate investor protection, inferior information environments, and less stringent accounting standards (Loureiro & Silva, 2022). According to Octaviani and Utama (2022), Indonesian stock market characteristics include weak investor protection, low market transparency, and regulatory issues. Further research is required to thoroughly investigate earnings manipulation impacts on stock price crash risk in Indonesian publicly traded companies.

Earnings manipulation practices, a type of agency problem, can lead to a heightened stock price crash risk and the implementation of effective corporate governance can help deter managers' opportunistic behavior. Studies conducted by Srinidhi and Liao (2020) found that good corporate governance practices can effectively decrease the risk associated with stock price crashes. Edmans (2013) found that blockholders apply governance through direct intervention in company operations through voting rights. Family owners place their family members or colleagues in strategic positions in the company, making it easier to control the company and suppress managers' abuse of authority. To maintain their wealth, family owners are committed to maintaining company's long-term sustainability and may be relatively risk averse Thomsen & Pedersen (2000). In family businesses, the risk of a stock price crash might be lessened due to the alignment of interests between majority shareholders, who possess voting power, and minority investors; the latter's goals are often in line with preserving the company's long-term viability, as suggested by Srinidhi and Liao (2020).

The opposite results were obtained from the study by Ryu and Chae (2019), who found that family corporate governance can increase information opacity and allow stock price crash risk. Majority shareholders with voting power typically prioritize their own interests over those of minority investors, a phenomenon commonly referred to as the entrenchment effect (Yang et al., 2023). The dominance of family owners in

determining company decisions makes non-family investors cautious when assessing company value and making investment decisions (Srinidhi & Liao, 2020). In other words, family ownership can increase agency problems because controlling shareholders can expropriate by maximizing their personal profits rather than the interests of non-controlling shareholders.

The lack of consistent findings in previous studies underscores the significance of this research. This study utilised a 10 percent ownership stake for family ownership, recognising it as a significant blockholder position. This level is crucial as it empowers the family to possess the necessary skills and drive to take an active part in corporate governance and supervision of the non-family executive team (Villalonga & Amit 2006). This research uses data from Indonesia, in which companies have characteristics of concentrated ownership (blockholders) with the largest shareholders controlled by the family (Zachro & Utama, 2021). This study is the first in Indonesia to investigate how family ownership influences the connection between earnings management and stock price crash risk and whether it either reinforces or hampers this relationship. The research framework is illustrated in Figure 1.

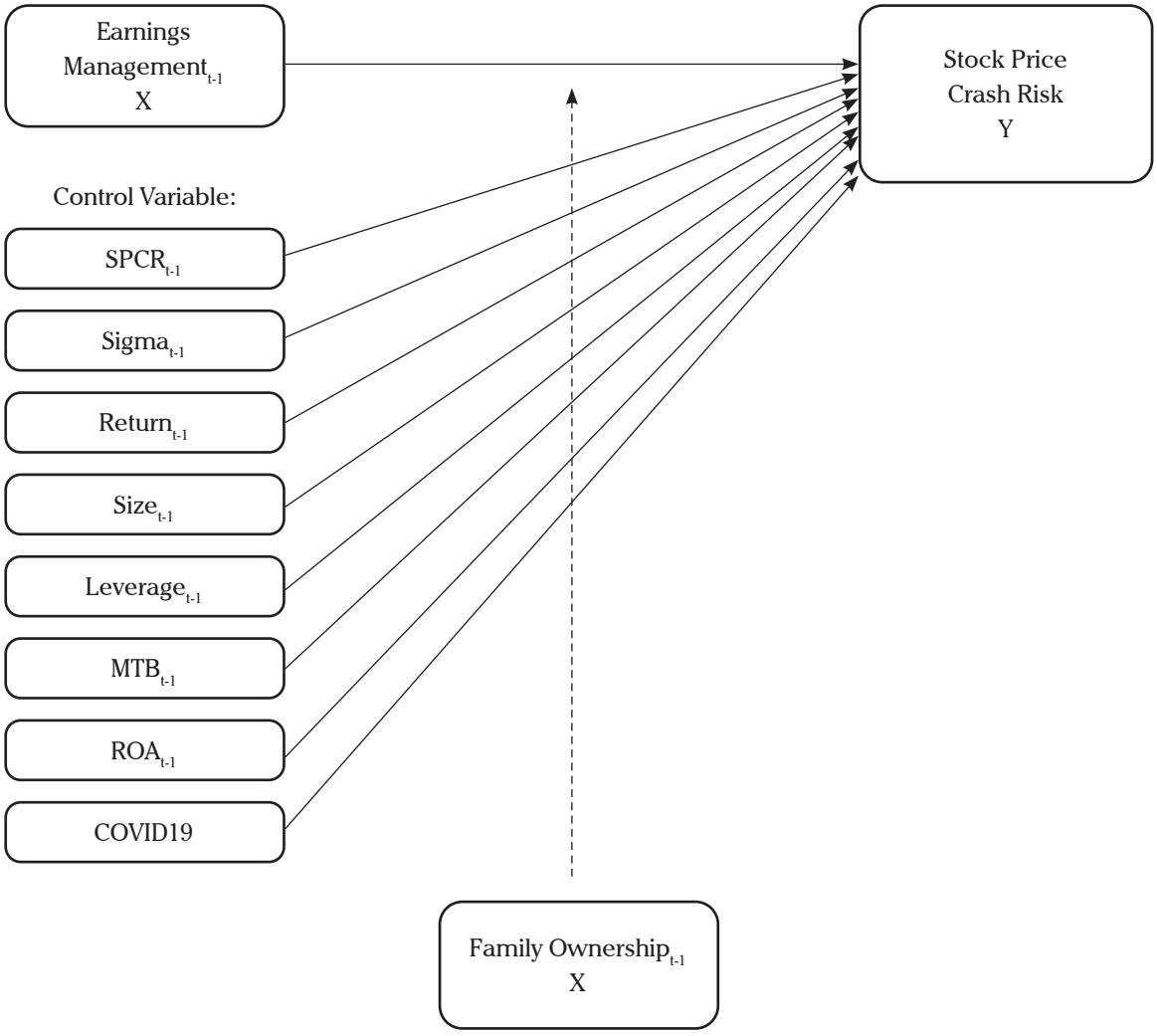

Figure 1. Research Framework

Hypothesis Development

Earnings management and stock price crash risk

Studies conducted by Loureiro and Silva (2022) indicated that earnings management has a more substantial positive impact on stock price crash risk, particularly in developing nations under inadequate investor protections. Another studies conducted by Hsu et al. (2022) discover similar results, indicating that executives concealing negative information about a company's performance may elevate the likelihood of a crash when this adverse information is made public. Moreover, (Hutton et al., 2009) discovered that the existence of asymmetric information is primarily due to managers' actions in concealing negative information, keeping it from investors until the point at which such information has accumulated sufficiently to result in a significant drop in share prices.

Research conducted by Chen et al. (2017) found as earnings smoothing rises to high level, the likelihood of a crash also increasing, resulting in greater losses in shareholder valuation. Management's manipulation of company financial statements leads to inaccurate assessments by investors. An overestimated value of a company causes its stock price to inaccurately reflect the company's stable financial base, potentially culminating in a sharp drop in the stock price. In line with the prior explanation, the initial hypothesis formulated in this research is articulated as follows:

H1: Earnings management has a positive influence on stock price crash risk.

Earnings management and stock price crash risk: a moderating role of family ownership

Optimal governance aims to lessen agency costs by protecting the rights of shareholders, re-harmonizing the interests of agents and owners, limiting information differences between owners and agents, and ensuring adequate monitoring and direction to agents (Utama et al., 2017). Studies published by Helling et al. (2019) found that concentrated ownership can decrease agency problems between shareholders and management related to the company's short-term problems. Good corporate governance practices are crucial in preventing the possibility of managers engaging in opportunistic behavior, such as manipulating profits, which should subsequently lower the probability of a significant decline in stock prices.

On the contrary, family ownership can also have a detrimental impact on a company's performance. According to Edmans (2013), concentrated ownership can worsen agency problems but cannot solve them. The existence of family owners is feared of prioritizing family interests rather than optimizing company value; their intervention can also reduce management's flexibility in operating company operations. Research led by Leuz et al. (2003) indicated that companies with concentrated ownership in nations with limited investor protection and inadequate law enforcement are more prone to earnings manipulation. Family-owned companies may experience greater agency issues than non-family-owned companies, ultimately leading to weakened performance and heightened stock price crash risk. In accordance with the earlier explanation, the second hypothesis formulated in this study is outlined below.

H2: Family ownership significantly moderates the relationship between earnings management and stock price crash risk.

METHODS

Research Sample

The research sample comprises non-financial corporations that were listed on the Indonesia Stock Exchange (IDX) between 2014 and 2023. The research period spanned 10 years, with the aim of gathering a sufficiently large and representative sample that could accurately reflect the study's objectives (Paramita & Makaliwe, 2022), including the stable pre-pandemic years and the volatile COVID-19 period. The sample does not include financial sector companies due to their distinct

regulatory framework and disclosure standards (Khalil et al., 2022). The sample determination is guided by several factors: non-financial corporations, members of the IDX from 2014 to 2023; their shares have been actively traded on the exchange for a period of at least 26 weeks within a given year (Kim et al., 2011); the company goes public through an IPO by 2022 at the latest, enabling the collection of comprehensive financial data for at least 2 fiscal years (Loureiro & Silva, 2022); and the company has complete financial reports for the period spanning 2014 to 2023.

Research model

This study employs panel data regression analysis to determine how earnings management impacts stock price crash risk, with family ownership influencing this relationship as a moderating factor. This study uses data for independent variables, moderating variables, and control variables spanning from period t-1 to forecast the occurrence of a crash in year t (Loureiro & Silva, 2022). Meanwhile, the COVID19 variable leverages period t to differentiate the effects of the COVID19 pandemic during the crash period t, resulting in the following research model:

The first research model.

$$\text{Crash Risk}_{i,t} = \beta_0 + \beta_1 \text{EM}_{i,t-1} + \beta_2 \text{Crash Risk}_{i,t-1} + \beta_3 \text{SIGMA}_{i,t-1} + \beta_4 \text{RETURN}_{i,t-1} + \beta_5 \text{SIZE}_{i,t-1} + \beta_6 \text{LEV}_{i,t-1} + \beta_7 \text{MTB}_{i,t-1} + \beta_8 \text{ROA}_{i,t-1} + \beta_9 \text{COVID19}_t + \varepsilon_{i,t} \quad (1)$$

The second research model.

$$\text{Crash Risk}_{i,t} = \beta_0 + \beta_1 \text{EM}_{i,t-1} + \beta_2 \text{EM}_{i,t-1} * \text{FAMOWN}_{i,t-1} + \beta_3 \text{Crash Risk}_{i,t-1} + \beta_4 \text{SIGMA}_{i,t-1} + \beta_5 \text{RETURN}_{i,t-1} + \beta_6 \text{SIZE}_{i,t-1} + \beta_7 \text{LEV}_{i,t-1} + \beta_8 \text{MTB}_{i,t-1} + \beta_9 \text{ROA}_{i,t-1} + \beta_{10} \text{COVID19}_t + \varepsilon_{i,t} \quad (2)$$

Variable Measurement

Stock price crash risk

This research will incorporate J. Chen et al. (2001) methodology for assessing the probability of stock price crash, involving the use of negative coefficient of skewness (NCSKEW) and down to up volatility (DUVOL) metrics. The weekly stock return calculation for each company is initially performed annually in accordance with the Kim et al. (2011) research model, prior to determining the stock price crash risk.

$$r_{i,t} = \alpha_i + \beta_1 r_{m,t-2} + \beta_2 r_{m,t-1} + \beta_3 r_{m,t} + \beta_4 r_{m,t+1} + \beta_5 r_{m,t+2} + \varepsilon_{it} \quad (3)$$

Let $r_{i,t}$ denote the return of company i in week t, while $r_{m,t}$ represents the market return (IHSG) in week t, and $\varepsilon_{i,t}$ signifies the residual of the regression result, comprising the portion of the stock return that cannot be accounted for by market factors. The calculation model utilises market return data from two weeks prior to and two weeks following t to account for low-intensity stock trading, which occurs nonsynchronously. The weekly returns are mathematically represented through the use of the natural logarithm of one plus the excess return, with a formula for the calculation being:

$$W_{i,\tau} = \text{Ln}(1+\varepsilon_{it}) \quad (4)$$

Weekly returns are calculated using residual returns, which support the idea that idiosyncratic factors are the cause of crash risk at the company level (DeFond et al., 2015).

NCSKEW (Negative Coefficient of Skewness)

The next step entails determining the risk of stock price crash using the research framework established by J. Chen et al. (2001), as specified below.

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

For a given company i, n denotes the count of trading weeks within a particular year t. In a negative skewness distribution, most data are on the right side, and the tail length is toward the left (long left tail), where the mean < mode < median. Conversely, in a positive skewness distribution, the

majority of the data is on the left side and the tail length is toward the right (long right tail), where the mean > mode > median. A higher NCSKEW value suggest that a significant stock price decline in more likely, whereas a lower NCSKEW value signifies a lower risk of such an event.

DUVOL (down to up volatility)

The research model proposed by J. Chen et al. (2001) incorporates DUVOL as its second measurement for calculating stock price crash risk, employing the formula:

$$DUVOL_{i,t} = Ln \frac{(n_u\text{-}1) \sum_{down} W_{i,t}^2}{(n_d\text{-}1) \sum_{up} W_{i,t}^2} \quad (6)$$

The count of weeks in which a company's weekly returns in year t exceed its average annual return, denoted as n_u, is referred to as up weeks. In addition, n_d is the trading weeks number within year t for company i in which the weekly returns fall short of the company's annual mean return. A higher DUVOL value is correlated with a greater chance of a stock price downturn, whereas a lower DUVOL value is linked to a reduced risk of such an event.

Accrual Earnings Management (AEM)

The modified Jones Model was employed to evaluate earnings manipulation through accruals, specifically within a framework developed by Kothari et al. (2005) that matches performance with discretionary accruals, and this framework involves the following steps.

1. Determine the total value of accruals by employing the formula as initially established by Dechow et al. (1995), as also further examined by Hribar et al. (2002).

$$TAC_{it} = EBXI_{it} - CFO_{it} \quad (7)$$

Let TAC_{it} denote the total accruals per year for company i; let $EBXI_{it}$ be the earnings before extraordinary items of company i in period t; and CFO_{it} will represent the operating cash flow per year for company i.

2. The Jones model has been adapted and elaborated on by Kothari et al. (2005) to calculate the non-discretionary accruals value.

The first step entails performing a regression analysis in order to calculate an estimated value for the alpha coefficient based on the following model:

$$\frac{TAC_{it}}{Asset_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{Asset_{it-1}} \right) + \alpha_2 \left(\frac{Delta\_REV_{it} - Delta\_REC}{Asset_{it-1}} \right) + \alpha_3 \left(\frac{P.P.E_{it}}{Asset_{it-1}} \right) + \alpha_4 R.O.A_{it} + \varepsilon_{it} \quad (8)$$

In step two, enter the alpha coefficient value from the regression results into the specified equation:

$$N\_DAC_{it} = \alpha \left(\frac{1}{Asset_{it-1}} \right) + \alpha_2 \left(\frac{Delta\_REV_{it} - Delta\_REC}{Asset_{it-1}} \right) + \alpha_3 \left(\frac{P.P.E_{it}}{Asset_{it-1}} \right) + \alpha_4 R.O.A_{it} + \varepsilon_{it} \quad (9)$$

Let TAC_{it} denote the total accruals per year for company t; let N_DAC_{it} represent non-discretionary accruals per year for company t; let $Assets_{it}$ signify total assets for company i in year t-1; let $Delta\_REV_{it}$ indicate revenue in year t minus the preceding year (t-1); let $Delta\_REC_{it}$ signify accounts receivables of year t minus the preceding period (t-1); let $P.P.E_{it}$ represent gross property, plant, and equipment in year t for company i; let $R.O.A_{it}$ denote return on assets (net income/total assets) of company i in year t; and let ε_{it} be standard error.

3. The modified Jones model that modified by Kothari et al. (2005) calculates the discretionary accruals value using the following formula.

$$DAC_{it} = TAC_{it} - NDAC_{it} \quad (10)$$

A positive discretionary accrual value reflects a company that is carrying out earnings management with income maximization or increasing profits from actual conditions, whereas a negative discretionary accrual value means the company is carrying out income minimization to reduce its profits. Consequently, the higher the absolute value of AEM, the more pronounced the practice of earnings management, and the reverse is also true.

Real Earnings Management (REM)

Research into REM is conducted by examining three key factors: abnormal cash flow from operations, abnormal production costs, and abnormal discretionary expenses, based on the methodology established by Dechow et al. (1998) and subsequently modified by Roychowdhury (2006).

1. Abnormal cash flow from operations(CFO)
The initial step involves conducting a regression analysis to calculate typical CFO values based on the following models.

$$\frac{CFO_{it}}{TA_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{TA_{it-1}} \right) + \alpha_2 \left(\frac{Sales_{it}}{TA_{it-1}} \right) + \alpha_3 \left(\frac{Delta\_Sales_{it}}{TA_{it-1}} \right) + \varepsilon_{it} \quad (11)$$

Following step 2, a standard CFO calculation is carried out utilizing the regression coefficients after the alpha coefficient value has been obtained. The next step involves conducting an abnormal CFO calculation utilising the following formula:

Abnormal CFO =
Actual CFO – Normal CFO (12)

2. Abnormal production cost
The first step involves conducting a regression analysis to calculate the normal production cost using these models:

$$\frac{PROD_{it}}{TA_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{TA_{it-1}} \right) + \alpha_2 \left(\frac{Sales_{it}}{TA_{it-1}} \right) + \alpha_3 \left(\frac{Delta\_Sales_{it}}{TA_{it-1}} \right) + \alpha_4 \left(\frac{Delta\_Sales_{it}}{TA_{it-1}} \right) + \varepsilon_{it} \quad (13)$$

Following step 2, the alpha coefficient value is utilized to conduct a standard production cost calculation with the aid of regression coefficients. The formula from which an abnormal production cost calculation is derived is as follows:

Abnormal PROD =
Actual PROD – Normal PROD (14)

3. Abnormal discretionary expenses
A regression analysis is conducted to estimate typical non-essential expenses using the specified models:

$$\frac{DIS\_EXP_{it}}{TA_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{TA_{it-1}} \right) + \alpha_2 \left(\frac{Sales_{it}}{TA_{it-1}} \right) + \varepsilon_{it} \quad (15)$$

Following step two, the alpha coefficient value is utilized to conduct a normal discretionary expense calculation, reliant on the derived

regression coefficients. The calculation for discretionary expenses is then performed using the following formula:

Abnormal DIS_EXP =
Actual DIS_EXP – Normal DIS_EXP (16)

Used denote cash flow from operations, CFO_{it} refers to this financial metric; $PROD_{it}$ indicate production (COGS + ΔINVENTORY); DIS_EXP_{it} represent non-essential expenses including advertising, R&D, and selling, general and administrative expenses; $Sales_{it}$ signify the year-over-year increase in sales for company i; $Delta\_Sales_{it}$ denote sales year t minus year t-1; and TA_{it-1} represent total assets in the previous yearfor company i.

4. Real earnings management (REM)
The REM value is determined using the three measurements mentioned earlier, as specified in the following formula (D. A. Cohen & Zarowin, 2010; Ge & Kim, 2014).

RealEM = Abnormal CFO + Abnormal PROD
+ Abnormal DIS_EXP (17)

Prior to incorporating the three aforementioned measurements, abnormal CFO and discretionary expenses are adjusted by multiplying abnormal values by -1 because higher value of these metrics suggest a greater likelihood that the company is inflating sales and cutting discretionary spending to artificially boost profits. Abnormal production is not countered by a negative factor of 1, since elevated production costs signify that the company is overproducing in an effort to decrease the cost of goods sold value. A high REM value suggests that the company is attempting to manage its real earnings in order to boost profits; on the other hand, a low REM value implies that the company may be reducing its profits.

Family Ownership

Previous research has defined family ownership in various ways. Andres (2008) described a family business is characterised by at least one of the following conditions: a) it is controlled by the founder and/or family members, who collectively posses at least 25 percent of shares with voting rights, b) if the company's share ownership is below 25 percent, the founder or a family member must hold a position as a director or commissioner. Research suggests that a family-run business is characterised as a company in which the founding family possesses at least 20 percent of the shares and holds voting rights due to the significant influence 20 percent ownership typically yields, and often, at least one family member sits on the board of directors (Faccio et al., 2002; Srinidhi & Liao, 2020). Maury (2006) used a threshold of 10 percent share ownership by families, both individuals and private companies not listed on the stock exchange, to categorize family companies. La Porta et al. (1999) used two alternative measurements of direct and indirect controlling shareholders with thresholds of 10 percent and 20 percent.

In this study, a company is considered to be under family ownership if family members hold a minimum of 10 percent of shares with voting rights either through familial ties or marriages. The 10 percent family ownership threshold is selected because it signifies a substantial blockholder level, which enables the family to possess the necessary financial motivations and institutional capabilities to actively monitor managerial decisions and exert significant de facto control, thereby allowing them to effectively moderate the relationship between earnings management practices and stock price crash risk. This definition was chosen because it has been commonly employed in prior research, including studies by (Claessens, Djankov, et al., 2002; Haider et al., 2021; Maury, 2006; Shyu, 2011).

Control variables

This study takes into consideration the effects of several factors that contribute to the probability of a stock price crash, as has been previously researched

by C. Chen et al. (2017); Fatima et al. (2020); Kim et al. (2011); Loureiro & Silva (2022). The control variables utilised in this study are $NCSKEW_{t-1}$ and $DUVOL_{t-1}$. This is because a crash in the stock market in year t-1 influences the probability of a crash in t period; hence, companies with high values of NCSKEW or DUVOL in year t-1 are likely to show similarly elevated values in year t. The volatility of stock returns is measured by $Sigma_{t-1}$, while $Return_{t-1}$ represents the average weekly returns of company i for the preceding period, and $Size_{t-1}$ is the logarithmic market capitalization of the company. The debt-to-assets ratio for company i in the previous period is represented by Lev_{t-1}, while MTB_{t-1} is the market-to-book ratio for company i in the preceding period. The return on assets from the previous year, or ROA_{t-1}, is a profit measure determined by dividing net earnings by the total assets.

The COVID-19 period is defined as the time frame beginning from 2020 through to 2023, reflecting the period when Indonesian government declared the COVID-19 pandemic status in the territory of the Republic of Indonesia to begin on 31 March 2020 and end on 21 June 2023. Thus, the binary variable COVID19 is set to 1 for all firm-year observations within this period (2020–2023) and 0 otherwise.

Data analysis methods

Based on previous research, in this study, winsorizing of independent and control variable data is performed at the 1 percent level of the entire sample to reduce the impact of outliers with extreme values, while winsorizing is not carried out on the dependent variable crash risk because this variable can capture extreme tails of the return distribution, and winsorizing can result in changes in values that are relevant to this study (Hsu et al., 2022; Loureiro & Silva, 2022). This study employed an unbalanced panel data model which utilized a dynamic panel data estimation approach that relied on the system-GMM (Generalized Method of Moments) technique to tackle potential endogeneity and non-linearity problems, which can lead to biased and inconsistent regression outcomes.

This study employs a two-step estimator model within the system-GMM approach, as the estimated coefficient values exhibit a lower level of habit and standard error when compared to the one-step estimator. In addition, this study also applies a correction by Windmeijer (2005) by using robust standard error or vce(robust) to obtain more accurate estimation results and minimize bias in the standard error (Kripfganz, 2019; Roodman, 2009). This study's total sample consists of 2,678 firm-year observations, and it will utilise unbalanced panel data regression analysis, employing the system-GMM estimation method through STATA 18.0.

RESULTS AND DISCUSSION

Descriptive statistics

Table 1 depicts that the NCSKEW mean value is -0.0971079, the standard deviation is 0.9678626, its maximum value is 6.547443, and the minimum value is -5.49486. The sample mean exhibits a negative NCSKEW value, indicating that the majority of the data points are concentrated on the left side, with the tail extending further to the right. Most research samples exhibit a positive skewness in their data distribution, indicating that the probability of a stock price crash is typically low. The second crash risk metric is DUVOL, with an average value of -0.0347553, a standard deviation of 0.6560565, a highest value of 7.404771, and a lowest value of -2.616321. Consequently, most of the research samples exhibit low volatility in stock returns, implying that the likelihood of significant stock price declines is similarly low.

According to table 1, accrual earnings management (AEM) has an average value of 0.0010605, a maximum value of 0.2233962, a minimum value of -0.1912084, and a standard deviation of 0.0746498. The findings indicate that the average level of accrual-based earnings manipulation in all study groups is almost negligible, reaching as high as 0.10 percent, suggesting a relatively low level of earnings manipulation. The positive AEM value indicates that, on average, companies in the sample use earnings management to maximise income or boost profits.

Table 1: Descriptive Statistics

Variables	Obs	Mean	Std. Dev	Min	Max
Dependent Variable					
Crash Risk$_{i,t}$					
NCSKEW$_{i,t}$	2,678	-0.0971	0.9679	-5.4949	6.5474
DUVOL$_{i,t}$	2,678	-0.0348	0.6561	-2.6163	7.4048
Independent Variables					
EM$_{i,t-1}$(Earnings Management)					
AEM$_{i,t-1}$(Accrual EM)	2,678	0.0011	0.0746	-0.1912	0.2234
REM$_{i,t-1}$(Real EM)	2,678	-0.0043	0.3123	-1.3705	0.8753
Moderation Variables					
FAMOWN10$_{i,t-1}$	2,678	0.8152	0.3882	0	1
Control Variables					
SIGMA$_{i,t-1}$	2,678	0.0516	0.0297	0.0066	0.1719
RETURN$_{i,t-1}$	2,678	-0.0015	0.0046	-0.0193	0.0194
SIZE$_{i,t-1}$	2,678	28.6996	1.8785	24.1377	33.4950
LEV$_{i,t-1}$	2,678	0.2611	0.1808	0.0000	0.8957
MTB$_{i,t-1}$	2,678	2.7731	4.7705	0.1544	34.7367
ROA$_{i,t-1}$	2,678	0.0372	0.0858	-0.3716	0.3580
COVID19$_{t}$	2,678	0.5418	0.4983	0	1

Real earnings management is characterised by a mean value of -0.004287, a standard deviation of 0.3123478, a lowest level of -1.370464, and a highest level of 0.8753274. A negative average suggests that the majority of sampled companies are employing real earnings management techniques to lower their profits. The FAMOWN moderation variable is quantified by the family's 10 percent equity stake; test outcomes reveal a mean value of 0.8151606, a standard deviation of 0.3882397, a maximum value of 1, and a minimum value of 0. The study confirms that 81.51% of the sample companies registered on the IDX can be classified as firms with family ownership according to the definition used in this research.

Correlation Test

A Pearson's correlation analysis was performed to identify the connection between two research variables. The correlation matrix in Table 2 is presented for all research variables spanning the years 2014-2023 with three predetermined alpha levels of 1 percent, 5 percent, and 10 percent. The data in Table 2 reveals a substantial, statistically significant, and positive association between dependent variables, NCSKEW and DUVOL. Previous studies by Loureiro & Silva (2022) have shown that crash risk factors are positively correlated. The consistent relationship between the crash measurement variables is evident, indicating that as the NCSKEW value rises, the DUVOL value also rises, resulting in identical sign and magnitude in crash risk measurement outcomes across various measurement types.

Regression results

A Sargan test was conducted prior to testing the research model to verify the accuracy of the estimates, yet the test was unabled to disprove the null hypothesis, indicating that the estimates are reliable or there are no correlation between the instrumental variables and the error term. The Arellano Bond test was used to test the reliability of the system-GMM estimator, and the test results showed that null hypothesis could not be rejected, showing that the estimator is reliable or that the AR(2) model's error term is not autocorrelated.

Table 2. Pearson's correlation matrix

VARIABLES	NCSKEW	DUVOL	$NCSKEW_{t-1}$	$DUVOL_{t-1}$	AEM_{t-1}	REM_{t-1}	$FAMOWN_{t-1}$	$AEM*FAM_{t-1}$	$REM*FAM_{t-1}$	$SIGMA_{t-1}$	$RETURN_{t-1}$	$SIZE_{t-1}$	LEV_{t-1}	MTB_{t-1}	ROA_{t-1}	$COVID19_t$
NCSKEW	1															
DUVOL	0.8320***	1														
	(0.0000)															
$NCSKEW_{t-1}$	-0.0026	0.0173	1													
	(0.9063)	(0.4380)														
$DUVOL_{t-1}$	-0.0250	0.0237	0.8206***	1												
	(0.2621)	(0.2877)	(0.0000)													
AEM_{t-1}	0.0355	0.043**	0.0072	0.0013	1											
	(0.0666)	(0.0260)	(0.7449)	(0.9536)												
REM_{t-1}	0.0195	0.0244	0.0054	-0.0031	0.431***	1										
	(0.3138)	(0.2077)	(0.8100)	(0.8897)	(0.0000)											
$FAMOWN_{t-1}$	-0.0093	0.0026	0.0015	0.0081	0.0194	-0.0026	1									
	(0.6303)	(0.8921)	(0.9448)	(0.7157)	(0.3167)	(0.8936)										
$AEM*FAM_{t-1}$	0.0430**	0.0480**	0.0030	0.0026	0.8971***	0.3674***	0.0101	1								
	(0.0262)	(0.0130)	(0.8921)	(0.9061)	(0.0000)	(0.0000)	(0.6000)									
$REM*FAM_{t-1}$	0.0227	0.0239	0.0020	-0.0034	0.3718	0.8860	-0.0066	0.4146***	1							
	(0.2406)	(0.2156)	(0.9271)	(0.8795)	(0.0000)	(0.0000)	(0.7346)	(0.0000)								
$SIGMA_{t-1}$	0.0141	0.0305	-0.0407	-0.0474**	0.0595***	0.0873***	0.0470**	0.0557	0.0631***	1						
	(0.4654)	(0.1145)	(0.0673)	(0.0331)	(0.0021)	(0.0000)	(0.0149)	(0.0039)	(0.0011)							
$RETURN_{t-1}$	-0.0039	-0.0226	-0.0276	0.0604***	0.0014	-0.0440	-0.0221	0.0042	-0.0302	-0.4723***	1					
	(0.8418)	(0.2421)	(0.2150)	(0.0066)	(0.9439)	(0.0228)	(0.2531)	(0.8263)	(0.1187)	(0.0000)						
$SIZE_{t-1}$	-0.0399**	-0.0961***	0.0211	-0.0349	-0.1253***	-0.1973***	-0.1880***	-0.0775***	-0.1267***	-0.2295***	0.1726***	1				
	(0.0391)	(0.0000)	(0.3433)	(0.1163)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0000)					
LEV_{t-1}	-0.0328*	-0.0366*	0.0011	-0.0011	0.0735***	0.167***	0.0633***	0.0638***	0.1579***	0.0453**	-0.0058	-0.0280	1			
	(0.0901)	(0.0583)	(0.9606)	(0.9610)	(0.0001)	(0.0000)	(0.0011)	(0.0009)	(0.0000)	(0.0191)	(0.7654)	(0.1469)				
MTB_{t-1}	0.0623***	0.0812***	0.0017	-0.0128	-0.0625***	-0.2169***	-0.1413***	-0.0165	-0.0812***	0.0567***	0.0171	0.2473***	0.0280	1		
	(0.0013)	(0.0000)	(0.9407)	(0.5662)	(0.0012)	(0.0000)	(0.0000)	(0.3933)	(0.0000)	(0.0033)	(0.3770)	(0.0000)	(0.1473)			
ROA_{t-1}	0.0170	-0.0020	-0.0269	-0.0449*	-0.0235	-0.3334***	-0.0189	0.0057	-0.2331***	-0.1848***	0.1419***	0.3871	-0.3579***	0.1648***	1	
	(0.3801)	(0.9187)	(0.2270)	(0.0435)	(0.2234)	(0.0000)	(0.3287)	(0.7664)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		
$COVID19_t$	-0.0780***	-0.0714***	-0.0651***	-0.0711***	0.0096***	0.0056	0.0545***	0.0118	-0.0097	0.3200***	-0.2041***	-0.1522***	-0.0770***	-0.0268	-0.0851***	1
	(0.0001)	(0.0002)	(0.0034)	(0.0014)	(0.6192)	(0.7725)	(0.0048)	(0.5407)	(0.6143)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.1662)	(0.0000)	

Research Model 1

According to the data in Table 3, the system-GMM method depicts that accrual earnings management (AEM_{t-1}) has a statistically significant impact on NCSKEW, with a probability value of 0.0190 signifying a 5 percent significance level, and a coefficient of 1.0582. The regression analysis showed a statistically significant probability value for the independent variable AEM_{t-1} of 0.0340 at a 5 percent significance level, with a corresponding coefficient of 0.5741 for the dependent variable DUVOL. Research suggests that AEM_{t-1} exerts a statistically significant positive influence on NCSKEW and DUVOL, indicating that higher accrual-based earnings manipulation in the current period is associated with an increased probability of a future stock price crash, thereby supporting research hypothesis 1.

This study's findings align with those of Loureiro & Silva (2022), which showed that earnings management through accruals in the prior period had a positive and significant impact on the current risk of a stock price crash (as measured by both NCSKEW and DUVOL). This study is consistent with findings from Hutton et al. (2009), showing similar outcomes, which suggest that accrual-based earnings manipulation can be used to conceal poor company performance data and is associated with a higher risk of a stock price crash.

Table 3. Earnings management and stock price crash risk

	NCSKEW		DUVOL	
	NCSKEW-AEM	NCSKEW-REM	DUVOL-AEM	DUVOL-REM
	(1)	(2)	(3)	(4)
AEM_{t-1}	1.0582**		0.5741**	
	(0.0190)		(0.0340)	
REM_{t-1}		0.0135		0.0390
		(0.4650)		(0.3560)
$NCSKEW_{t-1}$	0.0596*	0.0629**		
	(0.0555)	(0.0485)		
$DUVOL_{t-1}$			0.0364	0.0384
			(0.1410)	(0.1290)
$SIGMA_{t-1}$	1.9936	2.0888*	0.2050	0.2225
	(0.0790)	(0.0715)	(0.4045)	(0.3970)
$RETURN_{t-1}$	4.6210	4.9761	-10.4811**	-10.5578**
	(0.2640)	(0.2495)	(0.0145)	(0.0150)
$SIZE_{t-1}$	-0.3368***	-0.3332***	-0.2739***	-0.2738***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV_{t-1}	-0.9292***	-0.7328	-0.2370	-0.1314
	(0.0620)	(0.1105)	(0.2470)	(0.3500)
MTB_{t-1}	0.0530***	0.0519***	0.0524***	0.0512***
	(0.0005)	(0.0005)	(0.0000)	(0.0000)
ROA_{t-1}	0.4134	0.6800	0.5664*	0.7527**
	(0.2440)	(0.1240)	(0.0880)	(0.0385)
$COVID19_t$	-0.3250***	-0.3221***	-0.2162***	-0.2180***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Constant	9.8322***	9.6647***	7.8926***	7.8590***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)

***significance level = 0.01; **significance level = 0.05; *significance level = 0.10

The analysis of panel data regression also reveals that real earnings management (REM_{t-1}) yields a non-significant statistical probability value of 0.4650 at any level, with a coefficient value of 0.0135 relative to the dependent variable NCSKEW. The regression analysis also indicates that REM_{t-1} has a 0.3560 probability value, suggesting it is not statistically significant at any levels, and a coefficient of 0.0390 on the DUVOL variable. In conclusion, the results suggested that REM_{t-1} has no significant effect on NCSKEW and DUVOL. A positive coefficient implies that as real earnings management levels rise in the current period, the likelihood of a stock price crash in the subsequent period increases, but this correlation is not statistically significant, thus discrediting research hypothesis 1.

The divergence from prior literature, such as Francis et al. (2011), does not necessarily refute the theory but rather underscores a crucial contextual distinction. In the Indonesian emerging market setting, the opaque nature and higher economic costs associated with Real Earnings Management (REM), combined with potential weaknesses in investor scrutiny, suggest that REM's detrimental impact is primarily manifest as a gradual erosion of fundamental value rather than an immediate, sharp market correction. This difference likely reflects the longer gestation period required for operational damage to translate into an acute stock price crash event, leading to the statistically insignificant but positively directed results observed in this study.

The disparity in analysis outcomes between using AEM and REM variables as proxies for earnings manipulation is primarily attributed to the distinct underlying principles of the two proxies. The core objective of AEM is to control corporate earnings by altering financial reporting through accrual adjustments as per established accounting standards. Consequently, the impact of AEM is felt more immediately in terms of crash risk because it intensifies its effect on crash risk in a short space of time when the profit bubble bursts. The fundamental idea of REM is that business decisions which alter a company's operational activities can ultimately affect its reported profit. REM's effect on crash risk is generally lower due to its more frequent use in the long term.

Regression data reveal a statistically significant positive relationship between $NCSKEW_{t-1}$ and NCSKEW, which suggests that higher stock price crash risk in one period is linked to a higher stock price crash risk in the following period, as measured by NCSKEW. Similar findings were observed in the study conducted by Loureiro & Silva (2022), which demonstrated that the prior period's NCSKEW had a substantial positive impact on the subsequent period's NCSKEW. The $DUVOL_{t-1}$ regression analyses reveal mixed outcomes, specifically that the prior period's DUVOL has a positive but non-significant influence on the subsequent period's DUVOL, or the likelihood of a stock price crash in the prior period does not impact the probability of a subsequent crash risk, as measured by DUVOL. The findings reported here contrast with those of the research carried out by Ren et al. (2023), which revealed a statistically significant and positive effect of $DUVOL_{t-1}$ on DUVOL over the same period.

The analysis results obtained using the $NCSKEW_{t-1}$ variable and $DUVOL_{t-1}$ varied due to technical discrepancies in calculating crash risk between the two methods. Hutton et al. (2009) found that DUVOL is more affected by short-term fluctuations, resulting in greater volatility between periods, in contrast to NCSKEW, which exhibits high persistence between periods because it often correlates with the risk of crashes triggered by the concealment of adverse information. In addition, statistical analysis reveals that the COVID-19 pandemic significantly decreased companies' potential stock price crash risk across all four models. This protective effect coincided with the Indonesia Stock Exchange (IDX) issuing several emergency regulations, notably modifying the auto-rejection limit rules to a maximum of 7% on the IDX. The authorities are trying to limit the impact of stock price volatility by capping the lower limit of auto-rejection at a lower level, preventing

sharp declines and thus keeping the market stable. Previous research has demonstrated that the COVID-19 pandemic significantly reduced the stock price crash risk of energy and technology companies in China (Hossain et al., 2023; Huang & Liu, 2021).

Research Model 2

According to the estimated values in table 4, submodel 1, AEM_{t-1} coefficient value is -0.4984 and it has a probability of 0.5590, indicating it is not statistically significant. The AEM_{t-1} variable in submodel 3 also has a coefficient of -0.2469 and a probability of 0.6390, indicating that it is not statistically significant. In model 2, the AEM variables had a statistically insignificant negative impact on both NCSKEW and DUVOL. The research indicates that there is limited support for the idea that accrual earnings manipulation influences the probability of a stock price crash during the subsequent period.

When the family ownership variable is incorporated as a moderator in the model, distinct outcomes are generated. In submodel 1, the coefficient of interaction variable AEM*FAM is 2.0611 and a probability value of 0.0340, indicating significance at the 5 percent level. In submodel 3, the interaction variable AEM*FAM has a coefficient of 1.1037 and yields a significant statistical probability value of 0.0850 at 10 percent level. Family ownership can substantially mitigate accrual earnings management effects on the likelihood of a stock price crash in the subsequent period. The coefficient sign for the AEMt-1 variable suggests that family ownership strengthens the positive association between earnings management and stock price crash risk.

Aiken & West (1991) and J. Cohen et al. (2003) proposed a research model that incorporates interaction variables to assess how independent variables impact dependent variables, contingent on the level of the moderator variable; consequently, the total effect must be determined by summing the coefficients of both the independent and moderator variables to demonstrate their influence on the dependent variable. It is evident that the total effect of the AEM on the likelihood of stock crash in submodel 1 is 1.5627, where the level of significance is 0.0080, in contrast, for submodel 3, the impact is 0.8568 with a significance level of 0.0250. Research suggests that family-owned businesses could amplify the connection between earnings management and the risk of stock price crash, as gauged by metrics such as NCSKEW and DUVOL, thereby supporting the validity of research hypothesis 2. Edmans (2013) research supports the notion that blockholder ownership exacerbates agency problem type 2 by effectively disenfranchising minority shareholders. Concentrated family ownership can give the family controlling power over a company, hence there is worry that it may favour family interests at the expense of other shareholders or that an entrenchment effect will be experienced. Companies controlled by families may resort to more forceful earnings management strategies, thereby increasing the probability of a sudden plunge in stock prices.

Further testing using simple slope analysis is necessary to examine the conditional effect of the independent variables on the dependent variable in interpreting the research regression results with interaction variables (Dawson, 2014; Hayes, 2013). The shift from a negative insignificant to a positive significant effect of AEM on stock price crash risk indicates a crossover interaction, as the direction and significance of the relationship change dramatically, consistent with the explanation provided by J. Cohen et al. (2003) found that crossover interaction can be used in relationships where effects often work in opposite ways. Figure 2 visualises a representation of the simple slope, which shows the characteristics of crossover interaction, with the effect of accrual-based earnings management on stock price crashes in non-family firms being in a different direction than in family firms.

The findings unequivocally support the entrenchment hypothesis, indicating that family ownership acts as a catalyst amplifying the adverse

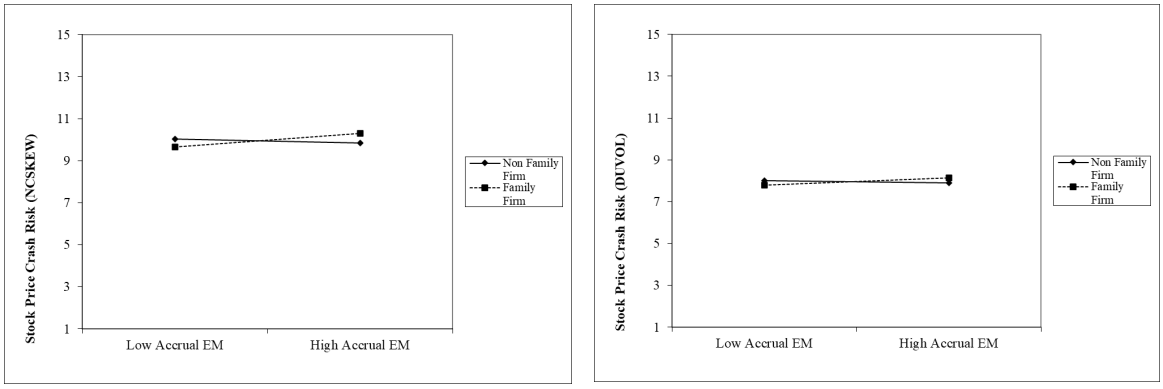

Figure 2. Simple Slope Analysis (AEM - stock price crash risk)

effect of earnings management (AEM) on stock price crash risk. The outcome is probably due to the poor institutional environment and widespread adoption of pyramidal ownership structures in emerging markets such as Indonesia, which allow the controlling family (in line with Agency Problem Type 2) to deliberately conceal bad news through accrual-based earnings management (AEM). Consequently, the family's pursuit of private benefits of control leads to a severe accumulation of negative information, which, upon eventual release, manifest as a more acute and substantial stock price crash.

A coefficient value of -0.5165 and a probability value of 0.1150 indicate that the REM_{t-1} variable is statistically insignificant based on the regression results in table 4, submodel 2. Conversely, in submodel 4, a coefficient value of 0.0430 and a statistical probability of 0.8360 also signify that the REM_{t-1} variable is not statistically significant. The REM variables in research model 2 did not significantly impact the probability of crash, as evidenced by the results for NCSKEW and DUVOL. It can be concluded that real earnings management in the previous period had minimal influence on the probability of a crash, or in statistical terms, there is no evidence that REM contributes to the likelihood of crash.

Including the role of family ownership as a moderator in the model yields distinct outcomes. In submodel 2, the coefficient for the interaction variable REM*FAM is 0.6123, with a statistical probability of 0.0980, or significant at the 10 percent level. In submodel 4, the variable REM*FAM exhibits a coefficient of -0.0051 and a probability value of 0.9830, and it does not meet the criteria for statistical significance. Family ownership can potentially mitigate real earnings management effect on the likelihood of a stock price crash in the subsequent period, however it is ineffective in moderating real earnings management effects on DUVOL.

The REM variable's total effect on crash risk was determined in two separate submodels. In submodel 2, the total effect measured 0.0958 with a corresponding significance level of 0.5700. Conversely, submodel 4 yielded a total effect of 0.0378, accompanied by a significance level of 0.7500. In family-owned businesses, earnings manipulation impacts the probability of a stock price crash, although the relationship is not statistically significant. In conclusion, overall in family-run firms, real earnings management does not have a significant effect on stock price crash risk, thereby contradicting research hypothesis 2.

Figure 3 illustrates the simple slope of submodel 2 and 4, indicating that the effect of manipulating real activities on stock price crashes varies differently in non-family firms compared to family firms. The simple slope analysis yields consistent findings, with the coefficients for the interaction variables being

Table 4. Earnings management and stock price crash risk: moderating role of family ownership

	NCSKEW		DUVOL	
	NCSKEW-AEM	NCSKEW-REM	DUVOL-AEM	DUVOL-REM
	(1)	(2)	(3)	(4)
AEM_{t-1}	-0.4984		-0.2469	
	(0.5590)		(0.6390)	
REM_{t-1}		-0.5165		0.0430
		(0.1150)		(0.8360)
AEM*FAM	2.0611**		1.1037*	
	(0.0340)		(0.0850)	
REM*FAM		0.6123*		-0.0051
		(0.0980)		(0.9830)
$NCSKEW_{t-1}$	0.0623*	0.0669*		
	(0.0910)	(0.0810)		
$DUVOL_{t-1}$			0.0376	0.0383
			(0.2590)	(0.2590)
$SIGMA_{t-1}$	1.9178	2.0394	0.1373	0.2223
	(0.1720)	(0.1530)	(0.8720)	(0.7940)
$RETURN_{t-1}$	4.7489	5.2064	-10.8829**	-10.5538**
	(0.5220)	(0.4780)	(0.0250)	(0.0300)
$SIZE_{t-1}$	-0.3403***	-0.3443***	-0.2760***	-0.2737***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV_{t-1}	-0.9470	-0.7221	-0.2450	-0.1319
	(0.1200)	(0.2120)	(0.4820)	(0.6980)
MTB_{t-1}	0.0546***	0.0513***	0.0536***	0.0512***
	(0.0000)	(0.0010)	(0.0000)	(0.0000)
ROA_{t-1}	0.4001	0.7634	0.5412	0.7518*
	(0.5140)	(0.2010)	(0.2020)	(0.0820)
$COVID19_t$	-0.3307***	-0.3209***	-0.2188***	-0.2180***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Constant	9.9431***	9.9819***	7.9574***	7.8564***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Total Effect	1.5627***	0.0958	0.8568**	0.0378
	(0.0080)	(0.5700)	(0.0250)	(0.7500)

***significance level = 0.01; **significance level = 0.05; *significance level = 0.10

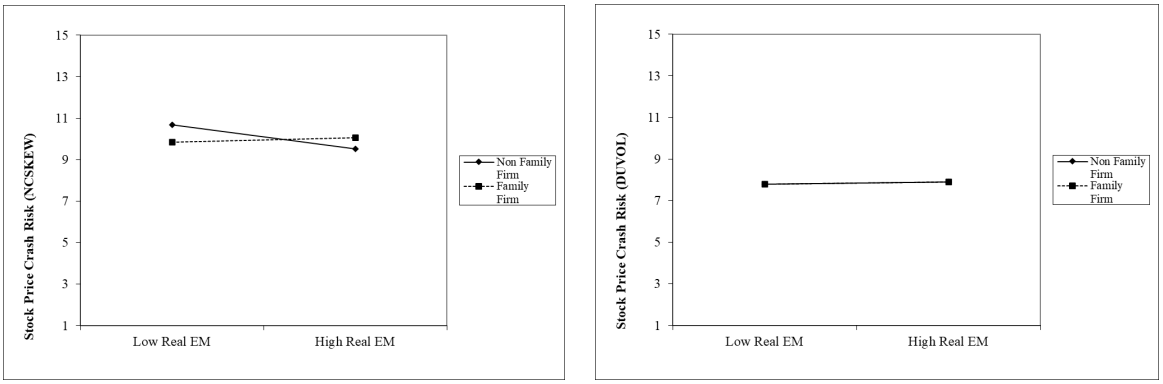

Figure 3. Simple Slope Analysis (REM - stock price crash risk)

statistically insignificant. This findings indicates that family ownership does not function as a substantial moderator in the connection between REM and stock price crash risk.

The lack of significant moderation implies that REM is less vulnerable to the governance or entrenchment effects of family ownership than AEM. The opacity inherent in REM activities is primarily the reason for their difficulty in being distinguished from legitimate business strategies by external investors, and potentially even family blockholders. The high economic costs of suboptimal operational decisions may limit the intensity of REM usage, thus diminishing its overall effect on severe tail risk as measured by NCSKEW and DUVOL.

Furthermore, within research model 2, the variable $NCSKEW_{t-1}$ exhibits a substantial positive influence on NCSKEW; essentially, the crash from the preceding year can trigger a crash in the current period. This outcome aligns with those of research model 1, which demonstrates that $NCSKEW_{t-1}$ has a statistically significant positive effect on NCSKEW during the subsequent period. While $DUVOL_{t-1}$ has a minimal positive impact on DUVOL, it can be stated that the current period's crash risk remains unaffected by the previous year's crash risk. The outcome is comparable to the findings of research model 1, which demonstrates that $DUVOL_{t-1}$ has a positive, yet statistically insignificant impact on DUVOL in the subsequent period.

Robustness Test

A robustness test is carried out to mitigate the effects of uncertainty in a research model, enabling the assessment of how estimation results hold up compared to other potential models (Neumayer & Plümper, 2017). A robustness test was conducted on the estimation results of research model 2 in order to evaluate their reliability, employing various definitions of the family ownership variable, with the minimum family share ownership threshold set at 20 percent, and 40 percent, respectively (Claessens, Fan, et al., 2002). Findings from the test results reveal a significant relationship between the interaction term family ownership and acrual-based earnings management and stock price crash risk at the thresholds of 20 percent and 40 percent, implying that family ownership can substantially strengthen the beneficial impact of accrual earnings management on this risk. The interaction between family ownership and real earnings manipulation seems to enhance the likelihood of a stock price crash, even though this effect is not substantial enough to be considered statistically significant, suggesting that family involvement is not sufficient to counteract the positive correlation between earnings manipulation and the risk of stock price crash.

The robustness test results indicate that the impact of family ownership on the relationship between earnings management and stock price crash risk is consistent across all types of family ownership metrics, regardless of the ownership threshold being 10 percent, 20 percent, or 40 percent. Additionally, the research model findings remain stable even when alternative definitions of family ownership are used, demonstrating its resilience.

MANAGERIAL IMPLICATION

Immediate action from both internal and external stakeholders is required due to the discovery that family ownership exacerbates the negative impact of earnings management on crash risk. This necessitates that Audit Committees in family-controlled firms enhance their oversight by increasing the independence and expertise of their members and intensifying scrutiny of high-discretionary accounting areas. The AC should establish protocols that promote the timely revelation of unfavorable news to avert the significant build-up of adverse information. Non-family executives need to link their rewards with long-term performance measures and resist the temptation to manipulate financial reports, whereas investors should be more vigilant and question the information provided, requesting more in-depth information about the company's

governance, including board and audit committee independence, and must consider family control as a significant risk when making investment decisions.

Regulatory bodies such as the OJK and BI must address the root cause of the entrenchment effect by enhancing minority shareholder rights and streamlining legal options for addressing private benefits of control and self-dealing. Government officials should consider introducing more stringent regulatory requirements, for instance, requiring a higher proportion of independent directors and independent Audit Committee members in publicly traded companies controlled by families. Government entities, including the Tax Authority, should increase cross-checking between tax filings and audited financial reports, focusing on companies with high family ownership and reported earnings that seem artificially inflated, to decrease both the risk of a stock price crash and potential revenue losses from tax evasion.

CONCLUSION

This study analyzed the interaction between earnings management, family ownership, and stock price crash risk among non-financial firms listed on the Indonesia Stock Exchange from 2014 to 2023. Our findings establish that Accrual Earnings Management (AEM) is a significant and immediate contributor to crash risk, indicating that discretionary accounting manipulation is an effective short-term mechanism for hoarding bad news which subsequently triggers a severe market correction. Crucially, the presence of family ownership significantly amplifies this adverse effect, strongly supporting the Entrenchment Hypothesis. This demonstrates that the family, acting as a controlling blockholder, leverages AEM not for better governance but for opportunistic private benefits, exacerbating the accumulation of negative information and positioning them as a catalyst for financial fragility rather than a stabilizing factor.

In contrast to AEM, the effect of Real Earnings Management (REM) on crash risk, and its moderation by family ownership, was discovered to be statistically insignificant. These findings imply that REM, which involves changes in operational activities, may be too opaque for the market to immediately detect as a crash threat, or its inherent economic costs (due to suboptimal business decisions) deter its aggressive use by firms. This highlights an asymmetry in information detection, where investors and auditors are more sensitive to governance-backed manipulation in accounting estimates (AEM) than to manipulation hidden within operational realities (REM).

In summary, this research provides strong evidence of the Agency Problem Type II within Indonesian family-owned businesses, where control concentrated in a single family undermines governance structure, turning the family into a source of systemic financial risk. While the study's scope is limited by its geographical and time boundaries, the findings underscore the urgent need for stricter regulatory supervision and greater independence for Audit Committees to counteract the entrenched behaviours that are causing substantial market volatility. Future research should expand the scope to conduct cross-country comparisons, investigating how diverse institutional protections influence the observed entrenchment mechanism.

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REFERENCES

Aiken, L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. In *Multiple regression: Testing and interpreting interactions*. Sage Publications, Inc.

Andres, C. (2008). Large shareholders and firm performance-An empirical examination of founding-family ownership. *Journal of Corporate Finance*, *14*(4), 431–445. https://doi.org/10.1016/j.jcorpfin.2008.05.003

Ball, R., & Brown, P. (1968). An Empirical Evaluation of Accounting Income Numbers. In *Source: Journal of Accounting Research* (Vol. 6, Issue 2). Autumn.

Bhutto, N. A., Shaique, M., Kanwal, S., Matlani, A., & Zahid, H. (2021). Impact of Earnings Management Practices on Stock Return. *Indonesian Capital Market Review*, *13*(1). https://doi.org/10.21002/icmr.v13i1.12839

Chen, C., Kim, J. B., & Yao, L. (2017). Earnings smoothing: Does it exacerbate or constrain stock price crash risk? *Journal of Corporate Finance*, *42*, 36–54. https://doi.org/10.1016/j.jcorpfin.2016.11.004

Chen, J., Hong, H., Stein, J. C., Campbell, J., Daniel, K., Froot, K., Jagannathan, R., Jorion, P., & Lamoreaux, C. (2001). Forecasting crashes: trading volume, past returns, and conditional skewness in stock prices $. In *Journal of Financial Economics* (Vol. 61).

Claessens, S., Djankov, S., Fan, J. P. H., & Lang, L. H. P. (2002). Disentangling the Incentive and Entrenchment Effects of Large Shareholdings. In *Source: The Journal of Finance* (Vol. 57, Issue 6).

Claessens, Stijn., Fan, J. P. H. ., & Lang, L. H. P. . (2002). *The benefits and costs of group affiliation : evidence from East Asia*. United Nations University, World Institute for Development Economics Research.

Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics*, *50*(1), 2–19. https://doi.org/https://doi.org/10.1016/j.jacceco.2010.01.002

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). Applied multiple regression/correlation analysis for the behavioral sciences, 3rd ed. In *Applied multiple regression/correlation analysis for the behavioral sciences, 3rd ed.* Lawrence Erlbaum Associates Publishers.

Dawson, J. F. (2014). Moderation in Management Research: What, Why, When, and How. *Journal of Business and Psychology*, *29*(1), 1–19. https://doi.org/10.1007/s10869-013-9308-7

Dechow, P. M., Kothari, S. P., Watts, R. L., & Simon, W. E. (1998). The relation between earnings and cash flows. In *Journal of Accounting and Economics* (Vol. 25).

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting Earnings Management. In *Source: The Accounting Review* (Vol. 70, Issue 2).

DeFond, M. L., Hung, M., Li, S., & Li, Y. (2015). Does mandatory IFRS adoption affect crash risk? *The Accounting Review*, *90*(1), 265–299.

Edmans, A. (2013). *BLOCKHOLDERS AND CORPORATE GOVERNANCE*. http://www.nber.org/papers/w19573

Faccio, M., Lang, L. H. P., Bigelli, M., Caprio, L., Ginglinger, E., Khanna, A., Mcconnell, J., Mengoli, S., Pye, R., Roberts, G., & Schwert, B. (2002). The ultimate ownership of Western European corporations $ We are grateful to. In *Journal of Financial Economics* (Vol. 65).

Fatima, H., Haque, A., & Usman, M. (2020). Is there any association between real earnings management and crash risk of stock price during uncertainty? An evidence from family-owned firms in an emerging economy. *Future Business Journal*, *6*(1). https://doi.org/10.1186/s43093-020-00038-5

Francis, B., Hasan, I., & Li, L. (2011). *Firms' Real Earnings Management and Subsequent Stock Price Crash Risk*. http://ssrn.com/abstract=1740044Electroniccopyavailableat:https://ssrn.com/abstract=1740044Electroniccopyavailableat:http://ssrn.com/abstract=1740044

Ge, W., & Kim, J. B. (2014). Real earnings management and the cost of new corporate bonds. *Journal of Business Research*, *67*(4), 641–647. https://doi.org/10.1016/j.jbusres.2013.01.021

Haider, Jahanzaib, Qayyum, Abdul, & Zainudin, Zalina. (2021). Are Family Firms More Levered? An Analysis of Family and Non-Family Firms. *SAGE Open*, *11*(2), 21582440211022320. https://doi.org/10.1177/21582440211022322

Hayes, A. F. (2013). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. In *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. The Guilford Press.

Helling, A. R., Maury, B., & Liljeblom, E. (2019). *Exit as governance: Do blockholders affect corporate innovation in large US firms?*

Hossain, A. T., Masum, A. Al, & Xu, J. (2023). COVID-19, a blessing in disguise for the Tech sector: Evidence from stock price crash risk. *Research in International Business and Finance*, *65*. https://doi.org/10.1016/j.ribaf.2023.101938

Hribar, P., Collins, D. W., & Collinst, D. W. (2002). Errors in Estimating Accruals: Implications for Empirical Research. In *Source: Journal of Accounting Research* (Vol. 40, Issue 1).

Hsu, C., Wang, R., & Whipple, B. C. (2022). Non-GAAP earnings and stock price crash risk. *Journal of Accounting and*

Economics, *73*(2–3). https://doi.org/10.1016/j.jacceco.2021.101473

Huang, S., & Liu, H. (2021). Impact of COVID-19 on stock price crash risk: Evidence from Chinese energy firms. *Energy Economics*, *101*. https://doi.org/10.1016/j.eneco.2021.105431

Hutton, A. P., Marcus, A. J., & Tehranian, H. (2009). Opaque financial reports, R2, and crash risk. *Journal of Financial Economics*, *94*(1), 67–86. https://doi.org/https://doi.org/10.1016/j.jfineco.2008.10.003

Khalil, M., Harianto, S., & Guney, Y. (2022). Do political connections reduce earnings management? *Review of Quantitative Finance and Accounting*, *59*(1), 273–310. https://doi.org/10.1007/s11156-022-01062-y

Kim, J. B., Li, Y., & Zhang, L. (2011). Corporate tax avoidance and stock price crash risk: Firm-level analysis. *Journal of Financial Economics*, *100*(3), 639–662. https://doi.org/10.1016/j.jfineco.2010.07.007

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, *39*(1), 163–197. https://doi.org/10.1016/j.jacceco.2004.11.002

Kripfganz, S. (2019). *Generalized method of moments estimation of linear dynamic panel-data models*. http://www.kripfganz.de/stata/

La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (1999). Corporate Ownership around the World. In *Source: The Journal of Finance* (Vol. 54, Issue 2).

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics*, *69*(3), 505–527. https://doi.org/10.1016/S0304-405X(03)00121-1

Loureiro, G., & Silva, S. (2022). Earnings management and stock price crashes post U.S. cross-delistings. *International Review of Financial Analysis*, *82*. https://doi.org/10.1016/j.irfa.2022.102215

Maury, B. (2006). Family ownership and firm performance: Empirical evidence from Western European corporations. *Journal of Corporate Finance*, *12*(2), 321–341. https://doi.org/https://doi.org/10.1016/j.jcorpfin.2005.02.002

Neumayer, E., & Plümper, T. (2017). *Robustness Tests for Quantitative Research*. Cambridge University Press. https://books.google.co.id/books?id=xhYuDwAAQBAJ

Nguyen, Q., Kim, M. H., & Ali, S. (2024). Corporate governance and earnings management: Evidence from Vietnamese listed firms. *International Review of Economics and Finance*, *89*, 775–801. https://doi.org/10.1016/j.iref.2023.07.084

Octaviani, F. A., & Utama, C. A. (2022). Impact of Corporate Hedging and ESG on Stock Price Crash Risk: Evidence from Indonesian Energy Firms. *Indian Journal of Corporate Governance*, *15*(2), 149–169. https://doi.org/10.1177/09746862221129341

Paramita, D., & Makaliwe, W. A. (2022). Stock liquidity and crash risk: Evidence from ASEAN emerging markets. In *Acceleration of Digital Innovation & Technology towards Society 5.0* (pp. 380–386). Routledge. https://doi.org/10.1201/9781003222927-56

Ren, X., Zhong, Y., Cheng, X., Yan, C., & Gozgor, G. (2023). Does carbon price uncertainty affect stock price crash risk? Evidence from China. *Energy Economics*, *122*, 106689. https://doi.org/https://doi.org/10.1016/j.eneco.2023.106689

Roodman, D. (2009). How to do Xtabond2: An Introduction to Difference and System GMM in Stata. *The Stata Journal*, *9*(1), 86–136. https://doi.org/10.1177/1536867X0900900106

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics*, *42*(3), 335–370. https://doi.org/10.1016/j.jacceco.2006.01.002

Ryu, H.-Y., & Chae, S.-J. (2019). Family Firms and Stock Price Crash Risk. *The Institute of Management and Economy Research*, *10*(4), 77–86. https://doi.org/10.32599/apjb.10.4.201912.77

Sandria, F. (2021, July 27). *Deretan Skandal Lapkeu di Pasar Saham RI, Indofarma-Hanson!* https://www.cnbcindonesia.com/market/20210726191301-17-263827/deretan-skandal-lapkeu-di-pasar-saham-ri-indofarma-hanson?page=all.

Shyu, J. (2011). Family ownership and firm performance: Evidence from Taiwanese firms. *International Journal of Managerial Finance*, *7*, 397–411. https://doi.org/10.1108/17439131111166393

Srinidhi, B., & Liao, Q. (2020). Family firms and crash risk: Alignment and entrenchment effects. *Journal of Contemporary Accounting and Economics*, *16*(2). https://doi.org/10.1016/j.jcae.2020.100204

Thomsen, S., & Pedersen, T. (2000). Ownership Structure and Economic Performance in the Largest European Companies. In *Management Journal* (Vol. 21, Issue 6). https://about.jstor.org/terms

Utama, C. A., Utama, S., & Amarullah, F. (2017). Corporate governance and ownership structure: Indonesia evidence. *Corporate Governance (Bingley)*, *17*(2), 165–191. https://doi.org/10.1108/CG-12-2015-0171

Villalonga, B., & Amit, R. (2006). How do family ownership, control and management affect firm value? *Journal of Financial Economics*, *80*(2), 385–417. https://doi.org/10.1016/j.jfineco.2004.12.005

Yang, M., Wang, Y., Bai, L., & Maresova, P. (2023). Corporate social responsibility, family involvement, and stock price crash risk. *Corporate Social Responsibility and Environmental Management*, *30*(3), 1204–1225. https://doi.org/10.1002/csr.2414

Zachro, S. F., & Utama, C. A. (2021). The Effect of Family Ownership on the Relationship between Busy Directors and Stock Price Crash Risk for Listed Firms on the Indonesia Stock Exchange. *Jurnal Keuangan Dan Perbankan*, *25*(1). https://doi.org/10.26905/jkdp.v25i1.4909