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## Article

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# Does Idiosyncratic Risk Affect Earnings Quality? Evidence from Indonesia

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## Abstract

This study examines whether idiosyncratic risk significantly affects earnings quality in non-financial companies listed on the Indonesia Stock Exchange. Research on developing countries, especially Indonesia, which links idiosyncratic risk and earnings quality, has not been widely conducted. This is interesting because the characteristics of the markets in developing countries are different from those in developed countries.

This study uses the dependent variable of earnings quality, which is the residual value of the Kasznik and Dechow–Dichev model, and idiosyncratic risk, which is measured based on the Capital Assets Pricing and Fama–French models. The overall results indicate that high idiosyncratic risk is associated with low earnings quality (large residual value). Robustness tests are also conducted based on groups of positive and negative profit companies, as well as industry groups. The same results were obtained for each earnings component, namely, innate and discretionary factors.

These findings contribute to the development of firm-specific risk literature as an additional analytical tool to assess earnings quality based on accrual rates. This allows regulators and standard-setters to provide more relevant information regarding investment decisions.

## Keywords

Idiosyncratic, Return, Earnings Quality, Accrual, Discretionary Accrual

## JEL Classification

G3, M41

## Introduction

This study aims to determine the effect of idiosyncratic risk on earnings quality using a sample of companies listed on the Indonesia Stock Exchange from 2015 to 2019. According to Penman and Zhang (2002), Schipper and Vincent (2003), and DeFond (2010), earnings quality is the ability of the earnings component to provide relevant and representative information for future decision-making. High earnings quality can provide complete information regarding company performance, which is relevant for decision making (P. Dechow et al., 2010). Research motivation is driven by recent research related to earnings quality and idiosyncratic risk in developed countries, such as the United States (Datta et al., 2017; Rajgopal & Venkatachalam, 2011) and Japan (Mitra, 2016). However, research on idiosyncratic risk and earnings quality in developing countries, especially in Indonesia, has not been widely conducted.

Research on idiosyncratic risk has been conducted in Indonesia (Geno et al., 2022; Noviayanti & Husodo, 2018). The phenomenon of idiosyncratic risk in Indonesia shows that a low information environment causes pricing errors (Widianingsih & Setiawan, 2022). Pricing errors indicate less informativeness. This condition can encourage managers to increase price informativeness by manipulating earnings, thereby reducing earnings quality.

This is interesting because the characteristics of the market in developing countries differ from those in developed countries (Morck et al., 2000), such that the price synchronicity of developing countries is greater than that of developed countries. Caner and Önder (2005) show that developing countries have less efficient market conditions with high abnormal return volatility. The results vary in several developing countries such as China, India,

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Indonesia, Brazil, and Mexico (Sharma et al., 2020). These five countries are the top five countries in the Emerging 7 country group based on overall economic size from January 2000 to December 2019. The results show that China has the most unstable volatility, India is volatile, and Indonesia shows relatively stagnant movements during and after the crisis until 2019. Firm-specific information variability is lower in countries with high levels of transparency, leading to lower idiosyncratic volatility (Bartram et al., 2009).

Previous research has shown that there is a phenomenon of increasing idiosyncratic volatility associated with a decrease in earnings quality. Existing research results (Campbell & Malkiel, 2000) have attracted increasing attention from researchers, specifically the phenomenon of a significant increase in idiosyncratic volatility in aggregate on the US stock exchange, even though market volatility tends to stagnate. In contrast to the condition of the US stock market, in the Japanese stock market during the fall of the stock market in the 1980s, the phenomenon of a decrease in the volatility of company returns and an increase in market volatility could be seen (Hamao et al., 2003). This condition is associated with the unusual phenomenon of idiosyncratic volatility, in which there is a significant increase in the homogeneity of Japanese corporate earnings in the post-crisis period. This is also revealed in the research of Wei and Zhang (2006) who found that fundamental factors such as declining and increasing earnings volatility can be used to determine the growth rate of idiosyncratic volatility. Wei & Zhang (2006) notes that the volatility of stock returns is fundamentally affected by profit uncertainty. Stock return volatility occurs in new companies compared with existing ones because new companies have uncertain future profits. The results of research on idiosyncratic risk associated with accrual management reinforce that idiosyncratic risk is related to a decrease in earnings quality (Datta et al., 2017; Widianingsih et al., 2022). Datta et al. (2017) found that discretionary accruals management is twice as large for companies with high idiosyncratic volatility compared to companies with low idiosyncratic volatility. This finding indicates that high idiosyncratic volatility is associated with higher earnings management levels.

This rest of this paper consists of four sections: the next section is a literature review and hypothesis development, followed by the research methods, the results of empirical tests, and the conclusion.

## Literature Review

### ***Idiosyncratic volatility and earnings quality***

Research (Roll, 1988) has revealed that high synchronicity or low idiosyncratic volatility are associated with more transparency in company-specific information. Thus, efforts to increase financial reporting disclosure encourage a decrease in information asymmetry related to company performance and reduce stock price volatility (P. M. Healy & Wahlen, 1999). Leuz and Verrecchia (2002) examined the consequences of disclosure quality that affect the increase in bid/ask spreads, trade volume, and the volatility of company stock returns. They hypothesized that German companies switching from German GAAP to IAS signaled a shift to better financial reporting standards committed to increased disclosure, which would lead to a reduction in information asymmetry. When German companies switch to IAS, there is a decrease in the bid/ask spread and an increase in trading volume. An increase in stock return volatility is likely to result in an increase in information asymmetry in the cost of capital.

Several studies have documented that high idiosyncratic volatility is associated with a decline in financial reporting quality. Bartram et al. (2012) examined the relationship between idiosyncratic return volatility and the quality of corporate disclosures and found a negative relationship between idiosyncratic volatility and disclosure quality. Chen et al. (2012) found that idiosyncratic volatility is negatively associated with the quality of the information disclosed at managerial discretion. Rajgopal and Venkatachalam (2011) explored the decline in financial reporting quality associated with an increase in idiosyncratic volatility over the last four decades (1962–2001). The results show that deteriorating earnings quality was associated with increased return volatility from 1962–2001. Earnings quality proxies have the potential to capture the fundamental earnings process as well as the intentional manipulation of earnings (Dechow et al., 2010). These results are consistent with research (Chen et al., 2010) that shows a decrease in earnings quality and an increase in idiosyncratic volatility after 2001.

Mitra (2016) examined the cross-sectional relationship between firm-specific return volatility and earnings quality in Japanese manufacturing companies from 2000–2012, regarding the contradictions related to the phenomenon of firm-specific return volatility as a proxy that captures information or firm-specific noise. Using a combination of systematic and unsystematic risks, we find that higher earnings quality is associated with lower firm-specific return volatility. Datta et al. (2017) state that there is a positive relationship between idiosyncratic risk and accruals management. Further, we find a positive association between residual volatility and discretionary accruals, regardless of whether accruals are income inflationary or deflationary. The findings reveal a strong relationship between a decrease in earnings quality and an increase in idiosyncratic volatility during the observation period. Hence, the first hypothesis:

*H1: Firms with high idiosyncratic risk are associated with low earnings quality*

### ***Idiosyncratic volatility and earnings quality based on innate and discretionary factors***

Francis et al. (2005) reported that earnings quality is driven by innate and discretionary components. The innate

factor is the driving factor that stems from the business model and the company's operating environment, whereas the discretionary component is the manager's discretionary reporting choice. Research (Guay et al., 1996) also recognizes that discretionary accruals reflect three different influences: managerial effort signaling firm performance, earnings management, and price noise. In a broad cross-section of companies, some managers use accruals to convey personal information, while others use accruals opportunistically (Healy, 1996). This statement is supported by research (Mitra, 2016) that states that the discretionary component of earnings quality reflects a combination of performance, opportunism, and noise. Thus, the effect of management's discretionary choices can be positive, negative, or neutral, depending on the dominant influence. The results of this study indicate that the innate component of earnings quality has a greater impact on firm-specific return volatility than the discretionary component of earnings quality. Hence, the second hypothesis:

*H2: The firm's idiosyncratic volatility has a greater effect on the innate accrual component than the discretionary accrual component.*

## Methods

### Sample

The test uses a sample of non-financial companies listed on the Indonesia Stock Exchange for the 2015–2019 observation period (Table 1).

**Table 1.** Industrial sectors.

Industry type	Sector	Total	%
1. Raw material producing industry	Agriculture	20	11%
	Mining	43	
		63	
2. Manufacture industry	Miscellaneous industry	46	32%
	Consumer goods industry	53	
	Basic industry and chemicals	79	
		178	
3. Service industry	Infrastructure, utilities, and transportation	73	56%
	Property, real estate, and building construction	81	
	Trade, service, and investment	159	
		313	100%
2,176 firm-year observations (unbalanced panel data) represent 554 companies from 2015–2019			100%

The first stage is collecting the data needed in the estimation of total accruals using the Dechow–Dichev (2002) and Kasznik (1999) models as a proxy for earnings quality variables. The next stage is data collection for idiosyncratic volatility estimation such as daily stock price data, composite stock price index, or Bank Indonesia Certificate rate as a proxy for the risk-free rate (723,912 daily data were collected). The next step is to determine the level of idiosyncratic volatility based on daily, monthly, and annual return variances using the Capital Assets Pricing Model (CAPM) and three-factor model (Fama & French, 1993).

### Earnings quality measurement

Earnings quality used in this study utilizes two measurements, as follows:

#### Accrual quality (Dechow & Dichev, 2002)

The first measure uses the quality of accruals based on the model by Dechow and Dichev (2002). This model describes the manager's actions for the realization of current and future cash flows or the reversal of past cash flows. The ability to realize cash flow based on this accrual will be affected by estimation errors in accruals arising from managerial incentives to manipulate earnings. Thus, this method is used to determine the extent of the accrual estimation error in mapping accruals into past, present, and future cash flows, as modelled by Dechow and Dichev (2002):

$$TCA_{i,t} = \varphi_0 + \varphi_1 CFO_{i,t-1} + \varphi_2 CFO_{i,t} + \varphi_3 CFO_{i,t+1} + v_{i,t} \quad (1)$$

Furthermore, McNichols (2002) proposed a better model to increase the accrual quality measure by adding the variables of changes in sales revenue and property, plant, and equipment:

$$TCA_{i,t} = \varphi_0 + \varphi_1 CFO_{i,t-1} + \varphi_2 CFO_{i,t} + \varphi_3 CFO_{i,t+1} + \varphi_4 \Delta REV_{i,t} + \varphi_5 PPE_{i,t} + v_{i,t} \quad (1a)$$

The descriptive variables in the equation are listed in Table 2. Therefore, this study uses model 1a to measure earnings quality, defined as the residual standard deviation of this equation ( $v_{it}$ ). The standard deviation of the residuals is a measure of inverse earnings quality. A higher standard deviation of the residuals indicates low earnings quality.

#### Absolute abnormal accruals (Kasznik, 1999)

Another widely used accrual-based earnings quality measure is the absolute value of abnormal accruals generated

by various versions (Jones, 1991):

$$TA_{i,t} = \delta_0 + \delta_1(\Delta REV_{i,t} - \Delta AR_{i,t}) + \delta_2 PPE_{i,t} + \delta_3 \Delta CFO_{i,t} + \eta_{i,t} \quad (2)$$

Equation 2 is a modification and extension of the Jones (1991) model of adjusting the sales revenue variable for changes in accounts receivable, following the advice of Dechow et al. (1995), which include changes in operating cash flows as an explanatory variable. Next, we treat the residue  $\eta_{i,t}$  from equation (2) as abnormal accruals and use the absolute value of abnormal accruals =  $|\eta_{i,t}|$  as the second proxy for earnings quality. We interpret higher (lower) absolute abnormal accruals as measures of lower (higher) earnings quality.

#### *Idiosyncratic risk measurement*

Idiosyncratic risk is a stock risk that is a firm-specific risk, otherwise known as unsystematic risk. Unsystematic risk is unrelated to the market and can be diversified. From an investor perspective, investors can reduce unsystematic risk by diversifying their portfolios. Thus, managers can manage idiosyncratic risk to reduce information asymmetry (Bartram, Brown and Stulz, 2012).

#### *Capital Asset Pricing Model (CAPM)*

Idiosyncratic risk is the standard deviation value of the variance ( $\xi_{it}$ ) calculated based on the CAPM (Sharpe, 1963; Lintner, 1965):

$$R_{it} - r_{it} = \alpha_{it} + \beta_i (R_{mt} - r_{it}) + \xi_{it} \quad (3)$$

where  $r_{it}$  is the stock return of securities,  $r_{it}$  is the risk-free rate,  $r_{mt}$  is the market return, and  $\xi_{it}$  is the idiosyncratic risk, calculated based on the standard deviation of residuals from the one-factor CAPM.

#### *Fama and French model*

The equation of the three-factor model by Fama and French (1993) is

$$R_{it} - r_{it} = \alpha_{it} + \beta_{im}(R_{mt} - R_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \xi_{it} \quad (4)$$

Idiosyncratic risk is the standard deviation value of the variance ( $\xi_{it}$ ), calculated based on Equation 4.  $R_{it} - R_{ft}$  is the excess return of the stock, which is the difference in the average return of the stock after deducting the risk-free rate;  $\beta_{im}(R_{Mt} - R_{ft})$  is the expected market premium and compensation for the market risk received by shareholders. Small minus big (SMB) is a factor of excess returns obtained by calculating the average return of small companies minus the average return of large companies:

$$SMB = 1/3(S/L + S/M + S/H) - 1/3(B/L + B/M + B/H) \quad (4a)$$

The high minus low (HML) factor was obtained by calculating the average return of the high book-to-market stock portfolio minus the average return of the low book-to-market stock portfolio:

$$HML = 1/2(S/H + B/H) - 1/2(S/L + B/L) \quad (4b)$$

#### **Control variables**

Many factors affect earnings quality, as documented in previous studies. This study uses earnings per share (EPS), asset growth (GROWTH), market capitalization (MKT\_CAP), return on assets (ROA), cash flow volatility (VCFO), and sales volatility (VSALE) as control variables, and industry type (INDUS) and company profit or loss (NI) as dummy variables.

#### **Hypothesis test**

Testing the first hypothesis using several combinations of configurations from equation 5:

$$EQ_{it} = \alpha_0 + \alpha_1 IR_{it} + \alpha_2 EPS_{it} + \alpha_3 GROWTH_{it} + \alpha_4 MKT\_CAP_{it} + \alpha_5 ROA_{it} + \alpha_6 VCFO_{it} + \alpha_7 VSELL_{it} + \alpha_8 INDUS + \alpha_9 NI_{it} + \xi_{it} \quad (5)$$

Subsequent hypothesis testing to determine the effect of idiosyncratic risk on earnings quality is distinguished by innate and discretionary factors, using the following equation:

$$EQ_{Innate_{it}} = \alpha_0 + \alpha_1 IR_{it} + \alpha_2 EPS_{it} + \alpha_3 GROWTH_{it} + \alpha_4 MKT\_CAP_{it} + \alpha_5 ROA_{it} + \alpha_6 VCFO_{it} + \alpha_7 VSELL_{it} + \alpha_8 INDUS + \alpha_9 NI_{it} + \xi_{it} \quad (5a)$$

$$EQ_{Dis_{it}} = \alpha_0 + \alpha_1 IR_{it} + \alpha_2 EPS_{it} + \alpha_3 GROWTH_{it} + \alpha_4 MKT\_CAP_{it} + \alpha_5 ROA_{it} + \alpha_6 VCFO_{it} + \alpha_7 VSELL_{it} + \alpha_8 INDUS + \alpha_9 NI_{it} + \xi_{it} \quad (5b)$$

## **Results**

### **Descriptive data**

Table 2 shows a description of the research data. Panel A shows the level of earnings quality in the form of residual values from the Kasznik and Dechow–Dichev models. Panel B shows the magnitude of idiosyncratic risk calculated using the CAPM and Fama–French models. Panel C shows the data for the control variables.

**Table 2.** Descriptive statistics.

	Observ.	Mean	Std. Dev.	Minimum	Q1	Median	Q3	Maximum
A. Earnings quality								
EQ_Kasznik	2,176	1.857	1.386	0.000	0.000	1.476	1.761	13.395
EQ_Dechow Dichev	2,176	22.488	2.550	0.000	22.254	22.461	23.014	29.213
B. Idiosyncratic risk								
IR_CAPM	2,176	1.748	1.176	0.001	0.385	1.623	2.180	13.660
IR_FAMA	2,176	1.750	1.163	0.001	0.386	1.628	2.178	6.149
C. Firm characteristics								
EPS	2,176	153.429	1178.708	-4,765.000	0.000	9.96718	61.575	3,530.000
GROWTH	2,176	0.297	4.104	-1.000	-0.024	0.057	0.166	166.833
MKT_CAP (in mil. INR)	2,176	10,200,000	39,500,000	330,770	1,620,000	5,248,909	10,200,000	550,000,000
ROA	2,176	-1.905	46.029	-1,611.666	0.000	0.028	0.070	1.852
VCFO	2,176	1.439	22.949	0.000	0.027	0.046	0.091	621.224
VSALE	2,176	7.290	136.866	0.000	0.043	0.104	0.226	3,312.435
INDUS (dummy var.)								
NI (dummy var.)								

Notes: The table contains summary statistics of the 2,176 firm-year observations that describe the characteristics of the 554 firms. Panel A is the residual value as a proxy for earnings quality based on the regression equation of the Kasznik and Dechow–Dichev models. Panel B is an idiosyncratic risk that is measured based on the CAPM and Fama and French model, calculated based on 723,912 daily return variances which are used as monthly and annual variances. Panel C is a control variable that is relevant to earnings quality such as EPS (earnings per share), Growth (growth opportunity), MKT\_Cap (market capitalization), ROA (return on assets), VCFO (volatility of operating cash flows), VSALE (volatility of sales), INDUS (industrial type dummy variable, 1 = raw material industry, 2 = manufacture industry, 3 = service industry), and NI (dummy variable of positive and negative net income company, 0 = negative net income company, 1 = positive net income company).

### Univariate analysis

This section presents the results of univariate analysis. Table 3 shows the correlations between the independent variables. Idiosyncratic risk is significantly correlated with an EPS of 0.076 and market capitalization of 0.227. EPS has a significant positive correlation with a market capitalization of 0.086, industry type of 0.055, and NI of 0.133. Market capitalization has a significant positive correlation with an NI of 0.237. ROA was significantly negatively correlated with a VCFO of -0.410 and VSALE of -0.424, and significantly positively correlated with INDUS (0.087) and NI (0.074). CFO volatility was significantly correlated with VSALE (0.432), INDUS (-0.108), and NI (-0.082). Sale volatility was significantly correlated with INDUS (-0.106) and NI (-0.089).

**Table 3.** Correlation between independent variables.

	IR	EPS	GROWTH	MKT_CAP	ROA	VCFO	VSALE	INDUS	NI
IR	1.000								
EPS	0.076***	1.000							
GROWTH	-0.021	-0.003	1.000						
MKT_CAP	0.227***	0.086***	0.024	1.000					
ROA	0.009	0.010	0.006	0.011	1.000				
VCFO	-0.018	-0.010	-0.009	-0.012	-0.410***	1.000			
VSALE	-0.018	-0.009	-0.007	-0.013	-0.424***	0.432***	1.000		
INDUS	-0.020	0.055***	0.027	0.014	0.087***	-0.108***	-0.106***	1.000	
NI	0.027	0.133***	-0.011	0.237***	0.074***	-0.082***	-0.089***	0.010	1.000

Notes: The table contains correlations between independent variables; \*\*\*, \*\*, \* = significance level is 0.01; 0.05; 0.10

To determine the relationship between idiosyncratic risk and earnings quality, the test is conducted for a whole company or group of companies with positive and negative earnings and industrial sector groups. This provides evidence for the consistency of the relationship between idiosyncratic risk and earnings quality. Table 4 shows the effect of idiosyncratic risk on earnings quality for firms with positive, negative, and total earnings in the idiosyncratic volatility quartile and earnings quality. Each group of companies was stratified quartile based on the level of idiosyncratic risk in the CAPM and Fama–French models, which was compared with the level of earnings quality based on the Kasznik and Dechow–Dichev models. Quartile 1 (Q1) shows the lowest idiosyncratic level, Q2 the middle idiosyncratic level, and Q3 the highest idiosyncratic level. Furthermore, with the level of earnings quality, Q1 shows the lowest earnings quality residual (high earnings quality) and Q3 shows the highest earnings quality residual (low earnings quality). This stratification shows that the higher the idiosyncratic (IR) level, the greater the residual value (EQ), which indicates low earnings quality. These results are consistent for each group of companies with negative, positive, and total profits.

The next test is based on industry classification (Table 5), in which there are three industry groups (Table 1). Each industry group is also stratified based on low (Q1), medium (Q2), and high (Q3) idiosyncratic risk quartiles. Additionally, the residual levels of earnings quality are low (Q1), medium (Q2), and high (Q3).

**Table 4.** The effect of idiosyncratic risk on earnings quality by positive and negative net income companies.

Negatif_Net Income	IR_CAPM	IR_Fama	EQ_Kasznik Model	EQ_Dechow Dichev
Mean	1.5963	1.5963	2.0588	22.4622
Q1	0.5225	0.5182	1.2830	22.2362
Q2	1.2053	1.1969	1.7844	22.4861
Q3	2.0033	2.0124	2.4498	23.2567
Positif_Net Income	IR_CAPM	IR_Fama	EQ_Kasznik Model	EQ_Dechow Dichev
Mean	1.4608	1.4658	1.1127	22.4673
Q1	0.3516	0.3372	0.0000	22.2542
Q2	1.4115	1.4107	1.0481	22.3405
Q3	2.2011	2.1959	1.5387	22.9743
Total_Net Income	IR_CAPM	IR_Fama	EQ_Kasznik Model	EQ_Dechow Dichev
Mean	1.4870	1.4910	1.2958	22.4663
Q1	0.3845	0.3859	0.0000	22.2542
Q2	1.3606	1.3688	1.1987	22.3522
Q3	2.1800	2.1780	1.7606	23.0137

Notes: The table contains quartiles (Q1, Q2, Q3) and the mean value of idiosyncratic risk and quality earnings classified based on negative, positive, and total net income. The table shows that the higher the idiosyncratic risk (IR) value, the higher the residual EQ value (low earnings quality).

The results show that the higher the idiosyncratic risk level, the higher the residual earnings quality (low earnings quality). These results are consistent for all industry groups.

**Table 5.** Effect of idiosyncratic risk on earnings quality by industry type.

1. Raw material industry	IR_CAPM	IR_Fama	EQ_Kasznik Model	EQ_Dechow Dichev
Mean	1.4290	1.4254	1.4401	22.6077
Q1	0.3755	0.3753	0.0000	22.2623
Q2	1.3390	1.3339	1.1343	22.3434
Q3	2.1024	2.0729	1.6780	22.9629
2. Manufacture industry	IR_CAPM	IR_Fama	EQ_Kasznik Model	EQ_Dechow Dichev
Mean	1.6096	1.6262	1.4469	22.7326
Q1	0.5203	0.5262	0.0000	22.2734
Q2	1.4427	1.4515	1.3575	22.3918
Q3	2.2746	2.2633	1.9155	23.1932
3. Service industry	IR_CAPM	IR_Fama	EQ_Kasznik Model	EQ_Dechow Dichev
Mean	1.4294	1.4278	1.1816	22.4892
Q1	0.2995	0.3047	0.0000	22.2477
Q2	1.3092	1.3101	1.0733	22.3405
Q3	2.1555	2.1528	1.6754	22.9600

Notes: The table contains quartiles (Q1, Q2, Q3) and the mean value of idiosyncratic risk and quality earnings per industry classification. The table shows that the higher the idiosyncratic risk (IR), the higher the residual EQ value (low earnings quality)

### Multivariate analysis

#### Idiosyncratic volatility and earnings quality (accrual)

This section presents the results of a multivariate analysis that examines the relationship between idiosyncratic volatility and earnings quality in several configurations. The test was performed using least-squares panel data. In Table 6, Panel A shows the effect of idiosyncratic risk; both the CAPM (models 1–4) and Fama–French models (models 5–8) show a positive relationship with residual earnings quality (Kasznik model). These results are consistent for all idiosyncratic risk configurations, with relevant control variables related to earnings quality (models 2 and 6). This result is strengthened by the addition of dummy variables in the form of industry type (raw material, manufacturing, and service industries), as well as positive and negative profit companies (models 3–4 and models 7–8).

Table 6 Panel B shows the results of the analysis of the effect of idiosyncratic risk (CAPM and Fama–French models) on earnings quality based on the Dechow–Dichev model with several configurations.

Based on the results of the Table 6 test, a positive (negative) earnings dummy variable indicates that companies with positive earnings have a better level of earnings quality than companies with negative earnings. To determine the effect of idiosyncratic risk on the group of companies, a special test was conducted on companies classified based on positive and negative earnings (Table 7). The results of the analysis show that idiosyncratic risk for all configurations is consistently related to earnings quality, namely, increases in idiosyncratic risk associated with declining earnings quality.

**Table 6-panel A.** Idiosyncratic risk and earnings quality: Kasznik model earnings quality

	CAPM				FAMA			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat
IR	0.1618	0.06856	0.14762	0.06232	0.13157	0.17654	0.11754	0.15720
	7.61281***	2.67797***	7.189825***	2.45070***	6.16251***	8.4493***	5.69830***	7.66231***
EPS		-0.00009		-0.00008		-0.00006		-0.00004
		-3.74067***		-3.02758***		-3.65783***		-2.73714***
GROWTH		0.02659		0.02620		0.07107		0.05557
		3.72857***		3.70140***		3.41978***		2.72640***
MKT_CAP		-0.46371		-0.42079		-0.33103		-0.27023
		-		-		-		-
ROA		13.74175***		-12.22384***		10.77881***		-8.85135***
		0.00330		0.00329		0.01266		0.01244
VCFO		2.87884***		2.89422***		6.16730***		6.19941***
		-0.00536		-0.00548		0.02615		0.02593
VSALE		-1.49693		-1.54215		8.62812***		8.74772***
		0.00475		0.00463		0.00287		0.00255
INDUS		7.64469***		7.50545***		3.07743***		2.79245***
			-0.15446	-0.06782			-0.15550	-0.08997
NI			-4.02082***	-1.59702			-4.03395***	-2.42669***
			-0.92185	-0.36834			-0.92649	-0.71478
			-	-			-	-
			13.75805***	-5.29264***			13.78108***	10.86456***
N	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176
Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Adj R <sup>2</sup>	0.02008	0.19107	0.08745	0.20357	0.01313	0.13615	0.08121	0.17375
F Stat	57.955***	62.310***	89.775***	52.603***	37.97658	61.320***	82.874***	63.597***

**Table 6-panel B.** Idiosyncratic risk and earnings quality: Dechow–Dichev model earnings quality

	CAPM				FAMA			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Coefficient							
	t-stat							
IR	0.102314	2.88552	2.67262	2.78663	0.10181	0.12244	0.10347	0.12425
	3.05450***	1.95499**	1.15336**	1.88682**	3.03565***	2.37942***	3.08107***	2.41463***
EPS		0.00050		0.00052		0.00009		0.00009
		0.28430		0.28934		1.70195**		1.66607*
GROWTH		2.52759		2.55735		0.00156		0.00206
		4.94079*		4.99841***		1.77010*		1.77140*
MKT_CAP		-0.00042		-1.15757		-0.00147		-0.00182
		-1.70514*		-1.76836*		-2.49971***		-2.62064***
ROA		0.012836		0.00067		0.00130		0.00181
		0.04991		0.0082		0.523287		0.71474
VCFO		-0.00068		0.02413		-0.01188		-0.01189
		-0.01540		0.09387		-1.62258*		-1.62223*
VSALE		0.75299		-0.00058		0.00347		0.00398
		0.31273		-0.01308		2.25502**		2.4460**
INDUS			6.45777	5.05082			0.08538	0.10451
			2.63780***	1.64231*			1.36037	1.18687
NI			-6.38758	-4.15627			-0.01623	-0.04933
			-1.49510	-0.82484			-0.14826	-0.35418
N	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176
Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Adj R <sup>2</sup>	0.00299	0.01165	0.00427	0.01241	0.00295	0.00581	0.00290	0.00651
F Stat	9.321***	4.04809***	4.958***	3.529***	9.215***	2.516***	3.698***	2.323***

Notes: The table contains the results of the analysis of the effect of idiosyncratic risk on earnings quality with various configurations. Panel A shows the effect of idiosyncratic risk based on the CAPM (1–4) and Fama and French model (5–8) on earnings quality based on the Kasznik model. Panel B shows the effect of idiosyncratic risk based on the CAPM (1-4) and Fama and French model (5–8) on earnings quality based on the Dechow–Dichev model. \*\*\*, \*\*, \* = significance level is 0.01; 0.05 ; 0.10

**Table 7.** Idiosyncratic risk and earnings quality by positive and negative net income companies.

	EQ = Kasznik Model				EQ = Dechow–Dichev			
	CAPM		FAMA		CAPM		FAMA	
	Model 1 Coefficient t-stat	Model 2 Coefficient t-stat	Model 3 Coefficient t-stat	Model 4 Coefficient t-stat	Model 5 Coefficient t-stat	Model 6 Coefficient t-stat	Model 7 Coefficient t-stat	Model 8 Coefficient t-stat
Positive net income companies								
IR	0.15747 6.98257***	0.05318 1.78009*	0.15682 7.00308***	0.05441 1.83816**	0.08675 2.35094**	0.13497 2.06781**	0.08175 2.23086**	0.12240 1.89253**
EPS		-0.00002 -0.84957		-0.00002 -0.84886		0.00010 1.73579**		0.00010 1.75414
GROWTH		0.01839 1.80836*		0.01842 1.80950*		0.00600 1.72414*		0.00617 1.72770*
MKT_CAP		-0.41426 -11.70948***		-0.41439 -11.71365***		-0.00185 -2.47388**		-0.00184 -2.46399**
ROA		-0.54425 -2.03389		-0.54352 -2.03128**		-0.27802 -0.49515		-0.27384 -0.48759
VCFO		0.05931 7.25377***		0.05929 7.25133***		-0.02223 -1.20158		-0.02224 -1.20190
VSALE		0.06576 1.32556		0.06577 1.32589		-0.09126 -0.87399		-0.09114 -0.87264
N	1,639	1,639	1,639	1,639	1,639	1,639	1,639	1,639
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Adj R <sup>2</sup>	0.02086	0.13733	0.02098	0.13747	0.00202	0.00946	0.001771	0.00895
F Stat	48.756***	31.929***	49.043***	31.964***	5.52695**	2.85567***	4.97673**	2.755***
Negative net income companies								
IR	0.12994 2.66642***	0.024798 1.82314*	0.09106 3.67598***	0.079405 3.74245***	0.14331 1.82352*	0.13579 1.71945*	0.15754 1.96021**	0.15103 1.86934*
EPS		-0.000117 -2.38365**		0.000166 2.60837**		-0.00004 -0.17783		-0.00004 -0.14667
GROWTH		0.001269 1.77433*		0.004671 1.81376*		0.00135 1.73720*		0.00131 1.73329*
MKT_CAP		-0.254429 -9.25043***		-0.074483 -1.76547*		-0.07365 -1.75798*		-0.07729 -1.78110*
ROA		0.000131 0.31987		0.000352 0.51506		-0.00053 -0.20311		-0.00057 -0.21815
VCFO		-0.002143 -1.53445		-0.03168 -0.72646		-0.54443 -3.27681***		-0.54435 -3.27799***
VSALE		0.000681 2.8995***		0.004364 0.73653		0.07397 3.27695***		0.07394 3.27728***
N	537	537	537	537	537	537	537	537
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Adj R <sup>2</sup>	0.01127	0.17706	0.022812	0.037837	0.004319	0.01512	0.005275	0.016119
F Stat	7.10982***	15.016***	13.512***	4.01113***	3.32524*	2.175**	3.84245*	2.25444**

Notes: The table contains the results of the analysis of the effect of idiosyncratic risk on earnings quality by positive and negative net income. Panel A shows the effect of idiosyncratic risk on earnings quality for positive net income companies. Panel B shows the company's negative net income. \*\*\*, \*\*, \* = significance level is 0.01; 0.05; 0.10

Tests on industry groups were also conducted (Table 8) to prove that the effect of idiosyncratic volatility on earnings quality is consistent for all configurations. This result is in accordance with the test in Table 6, which shows that the industry-type variable has an effect on earnings quality.

#### Idiosyncratic volatility and earnings quality (innate and discretionary accrual)

Further testing was conducted on the accrual component based on Francis et al.'s (2005) model, such as company size, cash flow standard deviation, and sales standard deviation. The test results (Table 9) show that an increase in idiosyncratic risk is associated with an increase in the residuals of the innate (Panel A) and discretionary (Panel B) components with various model configurations (models 1–8). A greater influence is shown by the built-in components for all models. The findings support Hypothesis 2 and previous research (Mitra, 2016) that the risk of idiosyncratic volatility has a greater effect on the innate component of accruals than on the discretionary component.

**Table 8.** Idiosyncratic risk and earnings quality by industry type.

	EQ = Kasznik Model				EQ = DD			
	CAPM		FAMA		CAPM		FAMA	
	Model 1 Coefficient t-stat	Model 2 Coefficient t-stat	Model 3 Coefficient t-stat	Model 4 Coefficient t-stat	Model 5 Coefficient t-stat	Model 6 Coefficient t-stat	Model 7 Coefficient t-stat	Model 8 Coefficient t-stat
<b>A.Raw material industry</b>								
IR	0.23147 2.76597***	0.48234 4.03819***	0.23131 2.79184***	0.47235 3.96483***	0.25449 3.54097***	0.25420 3.48155***	0.24706 3.44584***	0.24659 3.38713***
EPS		-0.00002 -0.24391		-0.00002 -0.24823		-0.00002 -0.43174		-0.00002 -0.43452
GROWTH		-0.24655 -0.76931		-0.23713 -0.73948		0.01280 0.06591		0.01805 0.09285
MKT_CAP		-0.09790 -0.79269		-0.09317 -0.75365		0.00248 0.03301		0.00505 0.06713
ROA		-0.000005 -0.00396		0.000005 0.00379		-0.00010 -0.13424		-0.00009 -0.12530
VCFO		-0.00254 -0.46012		-0.00252 -0.45710		0.00217 0.65058		0.00219 0.65382
VSALE		0.00008 0.09268		0.00008 0.09142		-0.00034 -0.65184		-0.00034 -0.65344
N	310	310	310	310	310	310	310	310
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Adj R <sup>2</sup>	0.02074	0.03757	0.02118	0.03582	0.03600	0.01904	0.03399	0.01701
F Stat	7.650***	2.751***	7.794***	2.666***	12.538***	1.856*	11.873***	1.764*
<b>B.Manufacture industry</b>								
IR	0.13064 4.69396***	0.13213 4.74019***	0.12604 4.64146***	0.12758 4.69105***	0.128702 3.74761***	0.12908 3.74279***	0.12706 3.79328***	0.1274 3.78735***
EPS		-0.00028 -1.99809***		-0.00028 -2.00144**		0.00004 0.22246		0.00004 0.21726
GROWTH		0.03600 1.73526*		-0.03608 -1.73670*		0.03033 1.79900*		0.03030 1.79856*
MKT_CAP		-0.03647 1.81070*		-0.03661 1.81361*		-0.05051 -1.90992*		-0.05033 -9.90684*
ROA		0.10801 0.47205		0.10944 0.47819		-0.07402 -0.26064		-0.073622 -0.25930
VCFO		0.03284 0.30164		0.03314 0.30432		-0.05441 -0.40263		-0.05399 -0.39964
VSALE		-0.08862 -1.28906		-0.08889 -1.29257		-0.01480 -0.17346		-0.01510 -0.177025
N	881	881	881	881	881	881	881	881
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Adj R <sup>2</sup>	0.02334	0.0238	0.02281	0.02329	0.014461	0.00950	0.01484	0.00987
F Stat	22.033***	4.064***	21.543***	3.998***	14.044***	2.218**	14.388***	2.266**
<b>C.Service industry</b>								
IR	0.159966 5.82480***	0.16031 5.83963***	0.10356 3.66781***	0.10377 3.67647***	0.10151 4.88267***	0.10191 4.88976***	0.10303 4.85073***	0.10345 4.8583***
EPS		0.00008 2.90940***		0.00008 2.87937**		0.00001 0.43862		0.00001 0.43743
GROWTH		0.00051 1.88984*		0.00016 1.72781*		-0.00163 1.77519*		-0.00164 1.77702*
MKT_CAP		-0.00684 -1.74525*		-0.00876 -1.72225*		-0.01588 -1.73410*		-0.01588 -1.73396*
ROA		-0.51435 -2.49232***		-0.51184 -2.46418**		0.07859 0.50163		0.07825 0.49938
VCFO		0.00719 0.396841		0.00757 0.41484		-0.00805 -0.58468		-0.00814 -0.59139
VSALE		-0.009902 -0.37431		-0.00841 -0.31591		-0.00702 -0.34930		-0.00700 -0.34837
N	985	985	985	985	985	985	985	985
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Adj R <sup>2</sup>	0.020491	0.02346	0.00785	0.01075	0.01430	0.011637	0.01411	0.011447
F Stat	33.928***	6.402***	13.453***	3.442***	23.84049	3.647***	23.529***	3.603***

Notes: The table contains the results of the analysis of the effect of idiosyncratic risk on earnings quality by industry type. Panel A shows the effect of idiosyncratic risk on earnings quality for the raw material industry, Panel B for the manufacture industry, and Panel C for the service industry. \*\*\*, \*\*, \* = significance level is 0.01; 0.05; 0.10

**Table 9-panel A.** Idiosyncratic risk and earnings quality based on innate and discretionary factors of accruals: Innate factor of accrual (Francis et al., 2005)

	CAPM				FAMA			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat
IR	0.0574 9.67533***	0.04507 7.05802***	0.05701 9.67045***	0.04464 7.03530***	0.05748 9.65920***	0.04628 7.17641***	0.05701 9.64442***	0.04570 7.13035***
EPS		0.00002 3.77065***		0.00002 3.08221***		0.00002 3.77251***		0.00002 3.08874***
GROWTH		-0.00201 -1.10188		-0.00191 -1.05618		-0.00200 -1.09771		-0.00191 -1.05322
MKT_CAP		-0.00035 -4.11446***		-0.00038 -4.34944***		-0.00035 -4.11546***		-0.00038 -4.34543***
ROA		-0.00026 -0.80498		-0.00023 -0.71756		-0.00025 -0.80042		-0.00023 -0.71487
VCFO		-0.00878 -9.56140***		-0.00880 -9.64285***		-0.00878 -9.56659***		-0.00881 -9.64648***
VSALE		0.00094 4.64424***		0.00100 4.93788***		0.00095 4.65014***		0.00100 4.93978***
INDUS			0.01846	0.00057			0.01859	0.00076
NI			1.74426*	0.05170			1.75616*	0.06913
			0.09301	0.08866			0.09267	0.08807
			5.51338***	5.10897***			5.49250***	5.07613***
N	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176
Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Adj R2	0.04091	0.15468	0.05467	0.16579	0.04078	0.15544	0.05446	0.16639
F Stat	93.612***	48.496***	42.854***	41.122***	93.300***	48.77475***	42.6841***	41.298***

**Table 9-panel B.** Idiosyncratic risk and earnings quality based on innate and discretionary factors of accruals: Discretionary factor of accrual (Francis et al., 2005)

	CAPM				FAMA			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat
IR	0.11853 5.07025***	0.08377 4.33318***	0.12000 5.19477***	0.07894 4.14301***	0.07538 3.20479***	0.04567 2.00348**	0.07705 3.31438***	0.04586 2.03465**
EPS		-0.00009 -3.83547***		-0.00007 -2.78883***		-0.00005 -2.15257**		-0.00003 -1.3974
GROWTH		0.02306 3.37489***		0.02266 3.36719***		0.02244 3.01634***		0.02261 3.07405***
MKT_CAP		-0.00241 -7.46420***		-0.00249 -7.76932***		-0.00287 -7.29178***		-0.00284 -7.23314***
ROA		-0.00051 -0.42685		-0.00063 -0.53197		-0.00636 -2.50670***		-0.00585 -2.32466**
VCFO		0.00178 0.51546		0.00180 0.52982		0.00027 0.063367		0.00101 0.2421
VSALE		-0.00279 -3.65764***		-0.00306 -4.06612***		-0.00399 -4.97940***		-0.00419 -5.27161***
INDUS			-0.12694	-0.03673			-0.12862	-0.08494
			-3.05566***	-0.90050			-3.08462***	-2.03103**
NI			-0.45147	-0.49756			-0.44944	-0.466006
			-6.82246***	-7.71168***			-6.76637***	-7.05365***
N	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176
Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Adj R <sup>2</sup>	0.0114	0.052804	0.035708	0.082366	0.00430	0.03009	0.02856	0.053119
F Stat	25.707***	15.470***	27.526***	19.121***	10.271***	10.472***	22.056***	14.320***

Notes: The table shows the effect of idiosyncratic risk on the accrual component. Panel A is the idiosyncratic effect of the innate factor and Panel B is the discretionary factor of accrual. \*\*\*, \*\*, \* = significance level is 0.01; 0.05 ; 0.10

## Discussion

This section presents a series of robustness tests to validate the importance of idiosyncratic volatility as a determinant of earnings quality. Table 6 shows the variation of the idiosyncratic risk measurement with the CAPM and Fama and French model, as well as the earnings quality measurement using the Kasznik (1999) and McNichols

(2002) models, which are modified versions of the Dechow–Dichev (2002). The test is expanded by examining the effect of idiosyncratic volatility on innate and discretionary components. The test results (Table 9) are consistent with the previous test (Table 6), where the level of idiosyncratic risk affects each accrual component with a greater effect on the innate component than on the discretionary component.

Tests based on company classification were also conducted to determine the specific impact on each group of companies by adding a positive/negative profit dummy variable (Table 7) and industry type (Table 8). Companies with positive (negative) earnings show high (low) earnings quality. This is in accordance with the previous theory, which states that an increase in losses reflects a significant decrease in operating cash flows, negative accruals, or a combination of both (Collins, Maydew and Weis, 1997; Givoly and Hayn, 2000; Hibrar and Collins, 2002). Driven by negative accruals as opposed to lower operating cash flows, the residual earnings quality with the Kasznik and Dechow–Dichev models tends to be higher, which indicates low earnings quality (Rajgopal and Venkatachalam, 2011). This is presented in Table 6 (models 3–4 and models 7–8). This test is reinforced by the results shown in Table 7, which reveal that the idiosyncratic effect on earnings quality is consistent for each group of companies with positive (negative) earnings.

The literature (Datta et al., 2017) shows that companies with high growth opportunities are associated with high information asymmetry and greater accrual management (Pastor & Varonesi, 2003). Both these assumptions indicate a low level of earnings quality. To control for this possibility, all the equation models include the asset growth variable (growth) in Tables 6–8. Asset growth is a control for a company's growth opportunities. Companies with high growth opportunities have the potential to be more aggressive in terms of earnings management. The results support previous research: companies with high growth show low earnings quality. To control for firm size, we include market capitalization variables for all equation models (Tables 6–8), because previous studies have documented that firm size is positively related to earnings quality (Datta, Iskandar-Datta and Singh, 2017; Zhong, Chourou and Ni, 2017). These results support previous research, namely, that large companies show better earnings quality.

## Conclusion

The results of this study add a new dimension to the relationship between idiosyncratic risk and earnings quality, especially in Indonesia, which has not revealed much about the relationship between these two proxies. This study uses the dependent variable of earnings quality from non-financial companies for 2015–2019. The independent variable is idiosyncratic risk, which is calculated based on the daily stock return variance. The overall results of the analysis show that idiosyncratic risk is positively related to residual accruals, which is a measure of inverse earnings quality. This finding indicates that an increase in idiosyncratic risk is associated with a decrease in earnings quality. High idiosyncratic risk provides opportunities for managers to manipulate earnings, which has the potential to reduce the ability of earnings to predict future cash flows. This condition has the potential to minimize earnings quality (Datta et al., 2017; Mitra, 2016; Rajgopal & Venkatachalam, 2011).

**Table 10.** Variable and measurement.

Variable		Measurement
Earnings quality (EQ)		
Total Current Accrual	TCA	$TCA = \Delta CA - \Delta CL - \Delta \text{cash} + \Delta \text{STDEBT}$ , $\Delta CA$ is the change in current assets, $\Delta CL$ is the change in current liabilities, $\Delta \text{cash}$ is the change in cash and $\Delta \text{STDEBT}$ is the change in short-term debt in current liabilities
Total Accrual	TA	$TA = NI - \text{CFO}$ , NI is the net income, CFO is the cash flows from operation
Cash flows from operation	CFO	The value of cash flows from operation
Change in cash flows from operation	$\Delta \text{CFO}$	Changes in cash flows from operation from year t-1 to year t
Change in revenues	$\Delta \text{REV}$	Changes in total revenues from year t-1 to year t
Property, plant and equipment	PPE	The value of property, plant and equipment
Change in account receivables	$\Delta \text{AR}$	Changes in net accounts receivable from year t-1 to year t
Risk idiosyncratic (IR)		
Risk idiosyncratic based on CAPM	IR_CAPM	The standard deviation value of the variance $\epsilon_{it}$ calculated based on the Capital Assets Pricing Model (CAPM)
Risk idiosyncratic based on Fama & French Model	IR_FAMA	The standard deviation value of the variance $\epsilon_{it}$ calculated based on the Fama three-factor model
Determinant of earnings quality		
Earnings Per Share	EPS	Net Income divided by the number of shares outstanding
Asset growth	GROWTH	Change in total assets of period t minus t-1 divided by asset t-1
Market capitalization	MKT_CAP	The log of the number of outstanding shares multiplied by the closing price
Return on assets	ROA	Ratio of earnings to assets
Volatility of cash flows	VCFO	Standard deviation of operating cash flow scaled by assets
Volatility of sale	VSale	Standard deviation of sales scaled by assets
Type industry_dummy	INDUS	1 = raw material industry; 2 = manufacture industry; 3 = service industry
Positive (negative) income_dummy	NI_dummy	0 = negative income company 1 = positive income company

The results of this study are expected to contribute to accounting policy regulators in developing an efficient financial reporting system to be used as a basis for valuing stock prices. This study only uses the accrual method in determining earnings quality so that future research can use other accounting-based methods, such as persistence and income smoothing. Earnings quality testing can also be done using market-based methods such as conservatism and value relevance.

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