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Value relevance of fair value hierarchy

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ABSTRACT

Implementing accounting standard 68 (PSAK 68) adopted by IFRS 13 has brought changes in reflecting the market value previously explained by earnings per share and book value. This study investigates the relevance of fair value estimates as measured by the beta coefficient in firms in the financial industry. Specifically, the study focuses on whether the hierarchy of fair value financial liabilities and assets of the firms can affect the market value. This is quantitative research using archival methods. Sampling used a purposive sampling technique with a sample of 240 firm-years. The results showed that financial assets for level 2 (inputs other than quoted prices that were observable directly or indirectly) and level 3 (unobservable inputs generated by entities) positively had value relevance. All three hierarchy fair values of financial liabilities fair value negatively had value-relevance. These results indicate that investors pay higher financial assets for levels 2 and 3 than level 1. Meanwhile, the value relevance of financial assets and liabilities, as measured by R-squared, was relevant. This suggests that investors also trust that each hierarchy's fair value affects the market value. The findings of this study have significant implications for the advancement of the clean surplus theory. The theory posits that the company's market value can be explained by the fair value of financial assets using level 2 and level 3 as well as level 1, level 2, and level 3 financial liabilities.

Introduction

This paper investigates the relevance of financial liabilities and asset fair values in the fair value hierarchy stipulated by IFRS 13 in Indonesia. The value relevance of accounting information is fundamental for users because it shows predictive value and feedback value. However, the value relevance of earnings has decreased over time (Qu & Zhang, 2015). This caused the presence of other information in the form of free cash flow agency problems (Maksy, 2016; Rahman & Mohd-Saleh, 2008), earnings management (Mostafa, 2017; Rahman, 2011; Subekti, 2010), book value (Narullia et al., 2019; Pathirawasam, 2013), cash flow and book value (Steffen Rapp, 2010). The other contributing factor is the changing of historical accounting standards to fair value accounting (IASB, 2011).

Barth (2006) argues that fair value accounting information provides information on the company's economic reality and gives quality financial statement information (Khurana & Kim, 2003). Fair value accounting has had an impact on discouraging equity investments over time (Palea, 2022). FV levels' disclosure is helpful to users of financial statements (Filip et al., 2021b). Zhang and Qu (2022) stated that both the combined value relevance of book value of equity (BV) and earnings (NI) and the value relevance of BV and NI have increased in the post-FVM adoption period. On the other hand, reporting investment property at fair value provides better predictive ability for future income than historical cost (A. W.-H. Hsu et al., 2020).

Paoloni et al. (2017) revealed that the high quality of aggregate earnings from financial instruments' fair value and fair value has increased relevance (Xiaoqing et al., 2012). Changes in the fair value of traded financial and available assets have explanatory power over stock returns compared to historical values (Koonce et al., 2011). Fair value accounting increases stakeholders' trust in assessment (C. Goh et al., 2021). There is a positive significant relation between the standard of fair value (IFRS 13) and the qualitative characteristics of the accounting information (Hameed et al., 2022). However, it requires reasoning, judgment, and understanding from users of financial statements (Laux & Leuz, 2009). The fair value also caused a decrease in value relevance (Chiqueto et al., 2015), with price fluctuations of the fair value of investment securities exhibiting greater significance (Jing & Kyu, 2010), higher risk (Zhuang & Luo, 2015), low aggregate earnings quality (Šodan, 2015), and improved financial reporting accuracy in the long term (Huang et al., 2017). Traded assets have high relevance and drive investment

decisions (Asker et al., 2014; Fazzari et al., 1988). Fair value based profit has no greater ability to predict the performance of investment companies (Seddighi et al., 2021).

Several previous studies have investigated the relevance of fair value but have yet to examine their relevance to the financial liabilities and asset fair value hierarchy. Examining the relevance of fair values in an Indonesian setting may offer insights into the relevance of fair value hierarchy disclosures. The hierarchical disclosure of financial liabilities and assets' fair value will provide more transparent information. Fair value that has value relevance will give investors confidence in owning company assets and encourage high bids for stock prices. The increase in profits, coupled with their consistent growth, leads to an increase in the value of company assets (Scott, 2015, p. 167). Positive changes in assets will encourage movements in the equity market's value. The fair value for available-for-sale financial assets is more relevant than held-to-maturity (Koonce et al., 2011).

This study used a sample of 240 firm-year observations from 48 financial firms and aimed to analyze whether the hierarchy of the financial liabilities and assets' fair values were relevant as measured by coefficient beta. First, by analyzing the pooled sample of 48 companies, this study found that fair value financial assets in the fair value hierarchy were not all value relevant for investors. However, the fair value hierarchy of financial liabilities was all value relevant. Second, the results showed that the levels 2 and 3 fair values of financial assets were more relevant for an investor than level 1. Investors placed less weight on level 1 fair-value assets than levels 2 and 3.

We organized the paper as follows: The following section reviews the literature on value relevance studies, mainly focusing on value relevance studies of the fair value hierarchy and the factors that influence it. The third section presents data and methodology, descriptive statistics, and the study's research design. Section 4 presents the results, and the final section concludes the study.

Literature Review

Accounting literature has extensively examined the value relevance of fair value hierarchy to distinguish how investors' price fair value is estimated using different inputs in recent years. Based on the data used to measure fair value, the fair value hierarchy is as follows: Level 1 (quoted prices in active markets), level 2 (inputs other than quoted prices that are observable either directly or indirectly, or quoted market prices for similar assets or liabilities), and level 3 (unobservable inputs generated by entities) (IASB, 2011).

Song et al. (2010) studied the banking industry and found that levels 1 and 2 are significantly more value relevant than level 3. In the meantime, Chung et al. (2017) focused on a sample banking and insurance and explained that each of the three levels helps investors reduce uncertainty toward the more opaque fair value estimates. They are associated with higher market pricing and lower information risk for level 3 estimates. Significant increases in the value relevance of fair value measurements for banks transferring assets in and out of level 3 fair value (Du et al., 2014). The difference in level 3 profits does not lead investors to estimate level 3 prices differently. Estimated fair value prices for level 1 and level 2 are set lower for banks with lower capital adequacy (B. W. Goh et al., 2015). A significant positive relationship was found between the accuracy of analyst estimates and the level 1 and level 2 fair value measurements, but not the level 3 measurement (Ayres et al., 2017). Companies with lower-level estimates are more likely to provide disclosures related to higher market prices and less transparent information risk. The company's voluntary reliability disclosures for the three fair value levels help reduce investor's uncertainty about fair value estimates (Chung et al., 2017). Disclosure of level 2 financial instruments is more significant but has little impact on level 1 and level 3 assets (Lu & Mande, 2014).

A fair value hierarchy has reduced information asymmetry related to reasonable value estimates. Nevertheless, a measurement level of 3 reduces uncertainty in the analyst's information environment (Barron et al., 2016). The valuation of fair value information is also determined by differences in the institutional environment and market developments (Fiechter & Novotny-Farkas, 2017). Fair-value assets designated at fair value through profit or loss are less relevant than available and available-for-sale assets. Alternative techniques are not considered a financial instrument available in the market and are subject to reasonable input from managers. However, a high fair value valuation in the financial statements indicates a higher total earnings quality (persistence, predictability, variability, and income smoothing) (Paoloni et al., 2017). Therefore, fair valuation is the basis for measuring assets (Razak & Stainbank, 2018).

The relevance of the fair value of financial assets level 1, level 2, and level 3 based on IFRS 13 has not been studied extensively in Indonesia. Research on value relevance generally used samples from European and American countries (B. W. Goh et al., 2015), (Chung et al., 2017), (C. Goh et al., 2021), (P. H. Hsu & Lin, 2016), (Siekkinen, 2016, 2017a, 2017b), (Filip et al., 2021a) and (Fortin et al., 2021). The test they carried out was based on a framework other than hierarchy. Siekkinen (2016, 2017a, 2017b) extended the research by B. W. Goh et al. (2015) and Song et al. (2010) using a more extended period and found that all fair value levels are also relevant. The value relevance of the fair value hierarchy increases over time. Levels 1 and 2 fair value assets are more value-relevant than level 3 fair value assets. Value relevance is lower for level 3 than levels 1 and 2 (Filip et al., 2021a).

The value relevance attached to fair value hierarchy levels' assets (i.e., Level 1, Level 2, or Level 3) reflects both the source of market information for fair value estimates (Fortin et al., 2021).

All studies examining the relevance of fair value by hierarchy found relevant information and diminish it by hierarchy. However, several previous studies analyzing the relevance of fair value in the US and European standards showed invalid results for the samples from Asia, mainly from Indonesia. Based on the findings of B. W. Goh et al. (2015), Chung et al. (2017), Goh et al. (2021), Hsu and Lin (2016), Siekkinen (2016, 2017a, 2017b), Filip et al. (2021a), and Fortin et al. (2021), the research hypotheses are as follow:

H1a. The fair value of level 1 financial assets is relevant as measured by the beta coefficient.
H1b. The fair value of level 2 financial assets is relevant as measured by the beta coefficient.
H1c. The fair value of level 3 financial assets is relevant as measured by the beta coefficient.
H2a. The fair value of level 1 financial liabilities is relevant as measured by the beta coefficient.
H2b. The fair value of level 2 financial liabilities is relevant as measured by the beta coefficient.
H2c. The fair value of level 3 financial liabilities is relevant as measured by the beta coefficient.

Research Method

The aim of this study was to analyze the relevance of the fair value of financial liabilities and assets variables using annual panel data from 2015 - 2019, covering 48 firms in the Indonesia Stock Exchange. This period was sufficient for more observations, and the number of observations was 240. One of the advantages of a panel data structure is that it has more observations and degrees of freedom. This approach may help avoid the problem of false regression and offers a parsimonious panel data approach from a dynamic and broader structural model. The fair value of financial liabilities and assets per level in the fair value hierarchy, earnings per share, the book value of equity per share, and shares outstanding were hand-collected from firms' annual reports. The share price data used was from the official site (finance.yahoo.com). Financial assets and liabilities were instruments measured based on the fair value hierarchy (PSAK 68). This research company sample was collected based on specific considerations (purposive sampling) (Sekaran & Bougie, 2017).

Prior value relevance studies used the fundamental Ohlson (1995) model or a modified Ohlson (1995) model to estimate accounting numbers' value relevance. A modified (Ohlson, 1995) model was applied to the accounting numbers from 2015 to 2019 financial statements to test the value relevance of the financial liabilities and assets' fair values in the fair value hierarchy. Following the model used by Goh et al. (2015) and Siekkinen (2016), this model research was divided into independent variables (FVA1, FVA2, FVA3, FVL1, FVL2, FVL3) and control variables (EPS, NBS). All variables were share-scaled to reduce scale effects, as proposed by Barth and Clinch (2009). The modified Ohlson (1995) model used to test hypothesis 1 and hypothesis 2 is as follows:

$$\text{Price}_{it} = \beta_0 + \beta_1 FVA1_{it} + \beta_2 FVA2_{it} + \beta_3 FVA3_{it} + \beta_4 EPS_{it} + \beta_5 NBS_{it} + \varepsilon_{it} \tag{1}$$
$$\text{Price}_{it} = \beta_0 + \beta_6 FVL1_{it} + \beta_7 FVL2_{it} + \beta_7 FVL3_{it} + \beta_8 EPS_{it} + \beta_9 NBS_{it} + \varepsilon_{it} \tag{2}$$

where price is the mean price of a firm's stock i seven days around the publication of financial statement (-3 days, 1, +3 days) and $FVA1_{it}$, $FVA2_{it}$, $FVA3_{it}$ are the fair value of financial assets per share of firm i related to levels 1, 2, or 3 of the fair value hierarchy at the end of the fiscal year t. $FVL1_{it}$, $FVL2_{it}$, and $FVL3_{it}$ are the fair value of financial liabilities per share of firm i related to levels 1, 2, or 3 of the fair value hierarchy at the end of the fiscal year t. The fair values of financial assets and liabilities were collected from annual reports and divided by outstanding shares. EPS is the earnings per share of firm i at the end of the fiscal year t. NBS is the book value of equity per share of firm i at the end of the budgetary year t.

To test hypothesis 1 and hypothesis 2, the observations from 2015 to 2019 were pooled into a sample consisting of 240 firm-year observations. The levels of fair-value financial assets are considered value-relevant if their coefficients are positive and significantly different from the value of zero (Siekkinen, 2016; Song et al., 2010). On the other hand, the levels of fair value financial liabilities are considered value-relevant if their coefficients are negative and significantly different from the value of zero (Siekkinen, 2016; Song et al., 2010). The additional testing for the relevance value of the fair value of financial liabilities and assets used time series regression of each firm by one sample test. The equation model for additional testing is as follows:

$$\text{Price}_{it} = \alpha_0 + \alpha_1 FVA1_{it} + \alpha_7 EPS_{it} + \alpha_{13} NBS_{it} + \varepsilon_{it} \tag{3}$$
$$\text{Price}_{it} = \alpha_0 + \alpha_2 FVA2_{it} + \alpha_8 EPS_{it} + \alpha_{14} NBS_{it} + \varepsilon_i \tag{4}$$
$$\text{Price}_{it} = \alpha_0 + \alpha_3 FVA3_{it} + \alpha_9 EPS_{it} + \alpha_{15} NBS_{it} + \varepsilon_{it} \tag{5}$$
$$\text{Price}_{it} = \alpha_0 + \alpha_4 FVL1_{it} + \alpha_{10} EPS_{it} + \alpha_{16} NBS_{it} + \varepsilon_{it} \tag{6}$$
$$\text{Price}_{it} = \alpha_0 + \alpha_5 FVA2_{it} + \alpha_{11} EPS_{it} + \alpha_{17} NBS_{it} + \varepsilon_{it} \tag{7}$$
$$\text{Price}_{it} = \alpha_0 + \alpha_6 FVA3_{it} + \alpha_{12} EPS_{it} + \alpha_{18} NBS_{it} + \varepsilon_{it} \tag{8}$$

Equations (3), (4), (5), (6), (7), and (8) examine the average value of R-squared (μR^2) of each fair value of financial liabilities and assets at level 1 (μR^2_1), level 2 (μR^2_2), and level 3 (μR^2_3). They are relevant if they meet the requirements, namely $R^2_1 > 0$, $R^2_2 > 0$, and $R^2_3 > 0$.

Results and Discussion

Table 1 presents descriptive statistics of each variable.

Table 1. Descriptive statistics

Variable	Mean	Maximum	Minimum	Std. dev
Price	2,195.66	27.575	50	3,951.19
FVA1	1,073.90	32,865	0	2,912.54
FVA2	3,719.36	129,817	0	10,613.95
FVA3	2,154.21	114,522	0	8,689.55
FVL1	405,47	12,178	0	501,42
FVL2	606.11	54,246	0	716.23
FVL3	552.23	35,552	0	635.78
EPS	168.95	2,109.00	-831.35	314.03
NBS	1,741.32	17,591.37	12.13	2,355.59

Table 1 presents descriptive statistics of the test variable. The number of observations is 240. The average stock price three days before and after the announcement of the financial statements. FVA1, FVA2, and FVA3 are fair values of financial assets per share for every level of the fair value hierarchy. FVL1, FVL2, and FVL3 are fair values of financial liabilities per share for every level of the fair value hierarchy. EPS is the earnings per share. NBS is the book value of equity per share.

The mean stock price was 2,195.66, lower than the standard deviation of 3,951.19. This indicates that the firms have a high variation of stock. The mean of level 1, level 2, and level 3 fair value of financial assets per share were IDR1,073.90, 3,719.36, and 2,154.21, respectively. Their value also indicates that the firm has more financial assets of level 2 than other levels. Finally, the mean earnings per share (EPS) and the book value of equity per share (NBS) were 168.95 and 1,721.32, indicating that the firm has a distribution of high earnings and equity.

Value Relevance of The Fair Value of Financial Liabilities and Assets

Before the value relevance of fair values in a hierarchy was studied, the results were examined using the pooled sample (48 firms). The value relevance of financial liabilities and assets fair values in the fair value hierarchy were tested with the modified Ohlson (1995) model as suggested by Song et al. (2010) and Siekkinen (2016). The regression was estimated with a sample of financial industry firms to obtain comprehensive results on financial liabilities and assets' fair value relevance. The regression analysis, as presented in Table 2, showed that not all financial assets' fair values in the fair value hierarchy according to IFRS 13 were value relevant. Meanwhile, all financial liabilities' fair values in the fair value hierarchy according to IFRS 13 were value relevant. Thus, hypotheses 1b and 1c accepted that the fair value of levels 2 and 3 financial assets had value relevance as measured by the beta coefficient, while hypothesis 1a rejected it. Meanwhile, hypotheses 2a, 2b, and 2c, which stated that the fair value of level 1, level 2, and level 3 financial liabilities were relevant as measured by the beta coefficient, were accepted.

The adjusted R-squared of financial assets was (0.915) higher than 0.74 and 0.84, as reported by B. W. Goh et al. (2015) and Siekkinen (2016). Likewise, the adjusted R-squared of financial liabilities was (0.904), which was suitable for explaining the relevance of the fair value of financial liabilities. The coefficients for fair value financial assets in level 2 (0.081) and level 3 (0.056) were significantly higher than the coefficients for level 1 (-0.343) assets. The fair value of levels 2 and 3 financial assets was more relevant than level 1. This suggests that financial assets determined using level 2 and level 3 fair values can explain the market value of equity. The results of this research corroborate the clean surplus theory (Ohlson, 1995) which states that the market value of company equity can be explained by accounting numbers determined by the fair value hierarchy of level 2 and level 3 financial assets. The results of this research, however, are contrary to the findings of Song et al. (2010), Siekkinen (2016, 2017b) and Mechelli and Cimini (2019) which have suggested that the three hierarchies of fair value of financial assets are significant to the market value of equity. This study found that the fair value of level 2 and level 3 financial assets had more vital value relevance than level 1, indicating that investors have more confidence and use information produced other than using quoted prices in active markets (market prices). Investors tend to pay higher prices for shares derived from financial assets measured by level 2 and level 3.

Table 2. Value relevance of the fair value of financial liabilities and assets

Hypothesis testing 1			
Variable	Coefficient	t-stat	p-value
Intercept	1,174.80	8.207	
FVA1	-0.343	-3.297	0.000***
FVA2	0.081	3.113	0.000***
FVA3	0.056	3.356	0.001***
EPS	4.010	7.531	0.000***
NBS	0.222	3.923	0.000***
n	240		
Adj. R-squared	0.915		
Hypothesis testing 2			
Intercept	1,152.76	7.712	
FVL1	-0.233	3.110	0.000***
FVL2	-0.161	-3.113	0.000***
FVL3	-0.140	-3.005	0.000***
EPS	4.012	6.441	0.000***
NBS	0.211	3.013	0.000***
n	240		
Adj. R-squared	0.904		
Additional Test			
FVA1	0.72	14.975	0.000***
FVA2	0.67	13.210	0.000***
FVA3	0.54	8.812	0.000***
FVL1	0.70	14.005	0.000***
FVL2	0.66	12.998	0.000***
FVL3	0.58	10.664	0.000***

Table 2 presents the results of the regression analysis. The dependent variable is PRICE. FVA1, FVA2, and FVA3 are the fair values of financial assets per share for every level of the fair value hierarchy. FVL1, FVL2, and FVL3 are the fair values of financial liabilities per share for every fair value hierarchy level. EPS is the earnings per share. NBS is the book value equity per share. Firms and year-fixed effects are used in the regression.
*   indicates statistical significance at 0.10 levels.
**   indicates statistical significance at 0.05 levels.
***   indicates statistical significance at 0.01 levels

Level 1 financial assets could not explain value relevance because companies could not optimize the use of level 1 fair value measurements for their own financial assets. In addition, the heterogeneity of companies and limitations in accessing level 1 measurement inputs indicate that relatively fewer financial assets are determined based on quoted prices in active markets. This gives rise to a need for more relevance of level 1 measurements in determining the market price of company equity. Another factor was that level 1 measurements did not reflect the actual market conditions at that time.

The earning per share (EPS) coefficient of 4.010 was higher than the book value equity per share coefficient (0.222), indicating that earnings more extensively drive the market value of equity than the book value of equity. The coefficients in the regression results were relatively low compared to those reported by (B. W. Goh et al., 2015) and (Siekkinen, 2016). The level 2 assets coefficient was 0.081 compared to 0.216, as observed by Siekkinen (2016) and 0.96, as documented by (Goh et al., 2015).

In the meantime, all three levels of fair value financial liabilities were value-relevant. The FVL1, FVL2, and FVL3 coefficients were −0.233, −0.161, and -0.140, respectively. The difference between the three coefficients was significant. The EPS coefficient of 4.012 was higher than the book value coefficients, indicating that the market value of equity is also more extensively driven by earnings than the book value of equity. The results of this study are in line with the findings of Song et al. (2010), Siekkinen (2016, 2017b), and Mechelli and Cimini (2019) which showed that the three hierarchies of fair value of financial liabilities are significant to the market value of equity. The fair value of level 1 financial liabilities and its value relevance which was more vital than levels 2 and 3 indicate that investors have more confidence and use liability information generated based on quoted prices in active markets (market price). Investors will pay a higher price for bonds originating from financial liabilities resulting from level 1 measurements compared to level 2 and level 3.

There are several possible reasons for the differences in coefficients. First, the characteristics across firms in the sample may drive the regression analysis results. Second, financial assets are more value-relevant in firms with high assets. The results might not be representative due to the heterogeneous sample. Even though all financial assets' fair values were not value-relevant, the levels of fair-value financial liabilities were value-relevant. Thus,

when analyzing the pooled sample, hypothesis 1a was rejected, while hypotheses 1b and 1c were accepted. Similarly, hypotheses 2a, 2b, and 2c were accepted.

The results of this research have implications for the development of the clean surplus theory (Ohlson, 1995), which states that the company's market value can be explained by the fair value of financial assets measured using levels 2 and 3, as well as level 1, level 2, and level 3 financial liabilities.

Additional Test

We performed an additional analysis to test the robustness of our findings. In the test, we estimated the regression parameters of equations (1) and (2) by determining the R-squared values of each financial firm. The test confirmed the findings obtained in equations (1) and (2) analysis. The results of additional tests of fair value relevance of financial liabilities and assets level 1, level 2, and level 3 as measured by R-squared showed value relevance (Table 2).

The results showed that differences in the estimated method positively affected the value relevance of the financial liabilities and fair value. All hierarchy fair values of financial liabilities and assets significantly affected the market value of equity. The adjusted R-squared indicated a decreasing level of fair value. The fair value of level 1 financial liabilities and assets was higher in determining the market value compared to level 2 and level 3. However, the adjusted R-squared remained below that of the adjusted R-squared of the coefficient regression analyses. These findings indicate that investors take into consideration all estimate levels when making investment decisions.

Conclusion

This paper has shown the hierarchy of financial and assets fair values value relevance as measured by the beta coefficient. First, by utilizing a modified Ohlson (Ohlson, 1995) valuation model on the pooled sample from 48 financial companies in Indonesia, the results showed that not all fair values of financial assets in the fair value hierarchy were relevant for investors. Further, level 2 and level 3 fair value of financial assets were more relevant than level 1. Investors were willing to pay higher for levels 2 and 3 fair value financial assets than for level 1 fair value. On the other hand, all three financial liabilities were relevant. One possible explanation for these findings might be that investors assume managers are more credible in conveying fair value information unavailable in an active market when estimating fair value. Investors are also convinced that all financial liabilities have provided real value. Thus, investors are reasonably confident and willing to pay higher prices for the fair value of levels 2 and 3 financial assets.

Second, the hierarchy of fair value relevance measured by R-squared indicated value relevance. Investors found that all levels of financial liabilities and assets' fair value were relevant to reflect market value. Level 2 and level 3 for financial assets showed greater relevance than level 1. For fair value assets of levels 2 and 3, where management discretion ultimately played a role, investors had sufficient confidence in the fair value estimates made by the company. In addition, investors were open to fair value estimates. Therefore, investors focused on fair value assets levels 2 and 3 when analyzing a company's financials.

This study contributes to fair value accounting literature because, to the best of our knowledge, it is the first study to investigate how the value relevance of fair values varies across financial firms. This study extends the examinations made by Siekkinen (2016), Goh et al. (2015), and Song et al. (2010) into a specific setting. Furthermore, by implementing an international approach, this study contributes to the literature by presenting global evidence of the value relevance of fair values under IFRS 13, adopted by the Indonesian accounting standard.

This paper is limited by the sample which only consists of financial industry companies and the use of financial asset classification based on the Statement of Financial Asset Standards (PSAK 55), resulting in potential differences with PSAK 71. The results also cannot be generalized to non-financial industry companies. Additionally, this study only investigated data periods when the company needed to implement accounting standards (IFRS 9). Future research can extend or compare financial instruments before and after using IFRS 9 to obtain comparable results with the fair value relevance of the financial assets of companies.

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