



VALUE RELEVANCE OF FAIR VALUE HIERARCHY INFORMATION OF  
NIGERIAN NON-FINANCIAL FIRMS

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**Abstract**

*Switch from Statement of Accounting Standard (SAS) to the International Financial Reporting Standards (IFRS) in Nigeria requires reporting entities to mark-to-market financial assets and liabilities and to recognise holding gains and losses as items of other comprehensive income. The objective of this study is to examine the value relevance of fair value hierarchy information. A total of 205 annual firm-year observations of non-financial firms listed in the Nigerian Exchange Group (NGX) spanning 2018 to 2022 was used. The result of multiple regression indicates that fair value gains and losses measured based on Level 1 and Level 2 were value relevant, but Level 3 inputs was not. This suggests that investors valued holding gains and losses quoted in an active market (Level 1) and indirect observable inputs (Level 2). No evidence to suggest that investors are using unobservable inputs (internally generated, Level 3). It is therefore recommended that reporting entities should ensure best disclosure practice relating to financial assets and liabilities to enhance reliability of subjective accounting earnings.*

**Keywords:** *comprehensive income, fair value hierarchy, other comprehensive income, value relevance, Nigeria.*

**INTRODUCTION**

International Financial Reporting Standards (IFRS) 13 requires reporting entities to mark-to-market certain financial assets and liabilities and to recognise holding gains and losses as items of other comprehensive income. The expansion of fair value application can be rooted to the fact that accounting assets and liabilities are considered to reflect economy reality (Kolev, 2009; Adeyemi & Kargi, 2022; Alkali, Bagudo & Aliyu, 2023). For consistency and comparability, the principles in the IFRS 13 explicitly classify valuation inputs for measuring fair value of assets and liabilities into three (3) hierarchy levels. Level 1 input utilised quoted prices in an active market and it is assumed as the most reliable evidence of fair value measurement. When quoted prices in an active market are unavailable, Level 2 inputs (indirectly observable inputs) is employed to value financial assets and liabilities. Where indirectly observable market inputs cannot be use, Level 3 inputs (unobservable inputs) are utilised to value certain financial assets and liabilities.

One unique objective of this study is to examine the value relevance of fair value hierarchy information for each of the three disclosure levels. One important argument on the use of fair value accounting is the trade-off between relevance and reliability. Several path-paving studies have argued that fair value information has greater relevance, more accurately reflects economic reality and simplifies financial reporting process (Song et al. 2010; Lee & Park, 2013; Siekkinen, 2016; Adeyemi & Kargi, 2022; Alkali, Bagudo & Aliyu, 2023). A major drawback here is the decreasing reliability of fair values gains and losses when fair value

hierarchy descend from Level 1 towards Level 3. Thus, the value relevance of the components of other comprehensive income could vary based on fair value hierarchy levels.

Using samples of non-financial firms listed in the NGX covering 2018 to 2022, this study documents that fair value gains and losses measured based on Level 1 and Level 2 were value relevant, but Level 3 inputs was not. The sample partition used in this study, which classifies fair value gains and losses based on the actual hierarchy measurements substantially differentiate this study from Lee and Park (2013) who classified all fair value gains and losses into either less subjective or more subjective components<sup>1</sup>.

The remaining of this paper is structured as follows: section two presents the review of related works and hypothesis development. Research method is presented in section three. Section four presents the findings and lastly section five concludes the findings of this study.

## LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Conceptually, fair value hierarchy information measures the extent of managerial discretion associated with other comprehensive income items. Fair value gains and losses on non-current assets, available-for-sale financial securities and pension reserves are classified based on hierarchy level of measurement. Level 1 is the valuation based on quoted prices in the active market; Level 2 is a measurement based on the observable input and Level 3 is a measurement based on unobservable input (internally generated valuation) as IFRS 7 stipulated. When reporting certain financial assets and liabilities based on the IFRS 13, preparers must determine an appropriate fair value hierarchy level from levels 1 to 3. Thus, items such as gains and losses on non-current assets and pension-liability adjustments that often-used Level 2 as well as Level 3 hierarchy may be considered less reliable as compared to re-measuring available-for-sale financial assets that often used level 1 (Song et al., 2010; Lee & Park, 2013; Adeyemi & Kargi, 2022; Well & Badenhorst, 2022). This implies that, the higher the level of subjectivity in measuring accounting earnings, the greater the information asymmetry problems and reliability concerns.

Valuation theory used to underpin the current study provides an intuitive background for understanding the relationship between accounting numbers and market value of equities. Because valuation theory assumes investors to be rational individuals with greater need for wealth maximization (Beaver, 2002), the theory provides a standard for explaining the relationship between comprehensive income item used to derive hierarchy information and market value of equities. This valuation reflects the statistical association between hierarchy information and share price, suggesting that the reported earnings numbers represent relevant information used by market participants (Song et al., 2010; Lee & Park, 2013).

Empirically, a good number of studies have examined this phenomenon. Goh et al. (2009) revealed that the value relevance of Level 1 assets was greater than Level 2 and Level 3, but they did not find any variation in the value relevance of Level 2 and Level 3 measurements. Kolev (2010), Song et al. (2010) and Adeyemi & Kargi (2022) documented that the value relevance of fair value Level 1 and Level 2 were greater than Level 3 fair values. In addition, Song et al. (2010) found that under SFAS 157, investors place less weight on Level 3 fair value

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<sup>1</sup> Given that some available-for-sale marketable securities could be measured using Level 2 and perhaps Level 3, partitioning other comprehensive income items based on the perceived degree of management subjectivity does not really reflect the actual reported figures as is the case with Lee and Park (2013).

assets relative to levels 1 and 2. Lu and Mande (2014) stipulated that Level 2 fair value gains and losses was positive and statistically significant, but Level 1 and Level 3 were not statistically significant. Their result was driven by the fineness of disclosures of Level 2 measurements and the frequency of bank's financial instruments measured at the Level 2 hierarchy.

Goh et al. (2015) extended the study of Song et al. (2010) by increasing the sampling period 2008-2011. They revealed that all fair values were value relevant. However, value relevance of Level 1 and Level 2 were greater than Level 3 fair value assets. Further, Goh et al. (2015) revealed a decreased value relevance difference between Levels 1 and 3 over time, especially during the financial crisis of 2008. An evidence of value relevance of fair values across 34 countries that varies in investor protection practices was provided by Siekkinen (2016). They documented that, fair values regardless of hierarchy level of measurement are value relevant in countries with a strong or medium investor protection environment. Only Level 1 was value relevant in a weak investor protection environment. Interestingly, they concluded that the variation in value relevance between Level 1 and Level 3 decreases with the quality of investor protection. Overall, these evidences suggest a reduced reliability of mark-to-model fair value earnings and hence investors could discount fair value gains and losses as hierarchy level decreases.

Even though most Nigerian firms are yet to adopt IFRS 13, some firms measured and disclosed dirty surplus accounting flows based on fair value hierarchy information on principles of IAS 39 (PwC, 2011). Proving class-level information enables users to evaluate the significance of financial assets and liabilities on firms' financial position and performance (PwC, 2011). Hierarchy level information could mean a more precise measure as compared to the use of held for trading and designated financial instruments as per the NG-GAAP. Again, re-measuring of noncurrent assets and pension liabilities often use established valuation techniques to determine fair value gains and losses. It can therefore be assumed that designate financial instruments and unestablished valuation approaches are less reliable due to discretions inherent in measuring fair value gains and losses. Similar evidence from Nigerian context that used sample of financial firms documented that Level 1 and Level 2 reduced tendency of cosmetic accounting, while Level 3 was positively associated with cosmetic accounting (Adeyemi and Kargi (2022). Considering the absence of the comparable IFRS 13 in the NG-GAAP (PwC, 2011), re-measuring of financial assets and liabilities based on hierarchy level makes Nigeria a unique setting for testing the value relevance of fair value gains and losses. It is therefore hypothesised that:

*H1: The reliability of other comprehensive income items decreases when fair value hierarchy descends from Level 1 towards Level 3 in the Nigerian market.*

## METHODOLOGY

The study focus on the value relevance of hierarchy levels of information of other comprehensive income items. Given the infrequent nature of other comprehensive income items, a condition of non-zero other comprehensive income items were assumed as Kubota et al. (2011) and Mechelli and Cimini (2014) Well and Badenhorst (2022). implemented. Specifically, data on gains and losses on non-current assets, gains and losses on available-for-sale financial securities and actuarial gains and losses on defined benefit plans are extracted for classification purpose. At the time of this study, financial data on these other comprehensive income items and notes to the accounts are not readily available at the DataStream. Thus, data

relating to these variables were handed collected. For extraction purpose, an additional condition where a firm must have its full annual report on the NGX or individual firm's website was observed. Based on these conditions, sample of 197 firm-year observations was drawn from 84 nonfinancial firms covering 2018 to 2022.

To investigate the value relevance of fair value hierarchy levels, a well-known theoretical work of Ohlson (1995) was employed. The paradigm has been extensively used in accounting and finance literatures to express the association between share price and book value of equity and abnormal or residual earnings. Equation (1) is based on the Ohlson (1995).

$$MVE_{it} = \beta_0 + \beta_1 BVE_{it} + \beta_2 E_{it} + \beta_3 V_{it} \quad (1) \quad \text{Where } MVE_{it} \text{ denotes}$$

the market capitalization calculated using the total number of outstanding shares and price per share.  $BVE_{it}$  equal to the book value of equity scaled by outstanding shares.  $E_{it}$  denotes earnings for the year scaled by outstanding shares and  $V_{it}$  stand for other information. The subscript  $i$  and  $t$  refer to the firm and year.

Because this study focuses on the value relevance of hierarchy levels of fair value gains and losses,  $E_{it}$  in the Equation (1) was decomposed into historical earnings (net income) and fair value earnings (gains and losses on other comprehensive income items). Note that the letter category is grouped based on hierarchy levels of 1 to 3. To test the value relevance of these hierarchy levels, Equation (2) was estimated as:

$$SP_{it} = \beta_0 + \beta_1 BVE_{it} + \beta_2 NI_{it} + \beta_3 FVAL1_{it} + \beta_4 FVAL2_{it} + \beta_5 FVAL3_{it} + \beta_6 LNI_{it} + \beta_7 NI_{it} * LNI_{it} + \varepsilon_{it} \quad (2)$$

Where  $SP_{it}$  represents firm market value of share. In Nigeria, all registered companies have legal obligation to file their annual reports with the SEC on or before the 90th day after the accounting year-end. Based on this requirement, four months  $SP_{it}$  after the end of the financial year was chosen. The justification for this choice is based on the best guess that all relevant information for decision-making is at the disposal of the users and would have been reflected in their portfolios (Harris & Muller, 1999; Barth, Landsman, & Lang, 2008).  $NI_{it}$  denotes net income for the year scaled by outstanding shares.  $FVAL1_{it}$  is fair value gains and losses based on quoted price in an active market,  $FVAL2_{it}$  stands for fair value gains and losses based on observable inputs and  $FVAL3_{it}$  represents fair value gains and losses based on unobservable inputs. All parameters are deflated by the outstanding share.  $LNI_{it}$  is an indicator variable measured as 1 if net income is zero and 0 otherwise;  $LNI_{it} * NI_{it}$  is the interaction between net income and the indicator variable; and  $\varepsilon_{it}$  is the disturbance term.

## RESULTS AND DISCUSSION

This section provides step by step analysis from sample calculation, descriptive statistics, correlations between the variables and findings on the value relevance of fair value hierarchy levels and influence of corporate governance mechanisms.

### *Descriptive Analysis*

Information presented in Table 1 shows an initial population of 84 firms. Using the filtering process discussed in section three (3) of this paper, 28 firms with zero other comprehensive income items were excluded from the population. Given lack of information on share prices, 15 more firms were lost. These bring down the population to 41 firms giving 205 non-financial firm-year observations covering 2018 to 2022 reporting periods. However, to achieve a more

acceptable data set for regression analysis motivates winsorization of the dataset at 2 percent similar to Kubota et al. (2011) and Mechelli and Cimini (2014). Using this technique, any abnormal observations in the dependent variables (share price) more than the 98 percent or less than 2 percent level of each variable were replaced with the same value at these 98 or 2 percentile values.

The descriptive statistics of the regression variables are presented in the Table 2. The data

Table 1

*Descriptive Statistics Related to Sample Firm From 2018 to 2022.*

<i>Sample</i>	<i>Total</i>
<i>Sample Calculation</i>	
Publicly traded Nigerian firms	84
Less:	
Companies with zero OCI	28
Companies without information on share price	15
Total number of firms included	41
Firm-year observations	205

The sample comprised Nigerian firms with at least one item of OCI between 2018 and 2022.

indicates that a pooled mean (median) of SP for the period of 2018 to 2022 was ₦6.12 (₦3.01). On average, the sample firms exhibited positive share price.

The pooled five-year mean (median) of NI\_S is ₦41.33 (₦0.19) billion. The average fair value gains and losses based on the quoted price on the active market (FVL1) was ₦0.22 billion. The mean of FVL2, which is based on the observable inputs was ₦0.46 billion and FVL3 based on the unobservable inputs was ₦0.19 billion. For most of the variables, the skewness and kurtosis values of the variables were less than +/-1.96 and +/-3.29 recommended by Field's (2005). Deviations from the benchmark of Field's (2005) were much within the skewness value of not more than 3 and kurtosis value of more than 10 recommended by Kline's (2011) for a normally distributed data.

**Table 3**

*Correlation Coefficients for Earnings Components (n=205)*

Variable	1	2	3	4	5	6
1 SP (N) <sub>it</sub>	1					
2 BVE_S <sub>it</sub>	.236*	1				
3 NI_S <sub>it</sub>	.323*	.075	1			
4 FVAL1 <sub>it</sub>	.147	-.011	.090	1		
5 FVAL2 <sub>it</sub>	-.113*	-.143*	-.080	.039	1	
6 FVAL3 <sub>it</sub>	.161*	.092*	.097*	.208*	.207*	1

*Descriptive Statistics Related to the Regression Variables for 2018-2020*

Variables	Mean	Median	SD	Min	Max	Skew	Kurtos
SP <sub>it</sub> = four-month share price after the financial year-end; BVE <sub>it</sub> = per share the book value of common equity; NI <sub>it</sub> = net income per share; FVAL1 <sub>it</sub> = quoted price in the active market; FVAL2 <sub>it</sub> = observable inputs; and FVAL3 <sub>it</sub> = unobservable inputs	6.12	3.01	11.20	0.50	59.50	0.96	2.16
	39.01	2.31	0.34	0.21	22.41	1.10	3.74
	41.33	0.19	0.71	-1.21	4.02	1.24	2.11
	0.22	0.17	3.32	-0.16	1.09	1.09	1.19
	0.46	0.66	3.09	-0.22	1.34	1.38	1.15
	0.19	0.29	2.11	-0.36	1.42	2.01	1.25

*Notes:* Panel A provides descriptive statistics on the relative size of earnings components. SP<sub>it</sub> = four-month share price after the financial year-end; BVE<sub>it</sub> = per share the book value of common equity; NI<sub>it</sub> = net income per share; FVAL1<sub>it</sub> = quoted price in the active market; FVAL2<sub>it</sub> = observable inputs; and FVAL3<sub>it</sub> = unobservable inputs and *i* and *t* refer to firm and year.

statistics of the variables presented in Table 2 are after winsorization at 2 percent level similar to Khan & Bradbury (2014) and Mechelli and Cimini (2014) and Well and Badenhorst (2022). Table 3 presents the result of Pearson correlation between the variables used in testing the value relevance of fair value hierarchy levels. Specifically, the correlation matrix shows the relationship between the explanatory variables, the direction of the relationship and the significance of the relationships. BVE\_S<sub>it</sub>, NI\_S<sub>it</sub> and fair value hierarchy levels are positively

It is worthy of note that the



correlated with the  $SP_{it}$  and moderately correlated with other explanatory variables. Overall, the strength of the relationship between the independent variables are within the acceptable threshold limit. As recommended by Pallant (2007), no variable with coefficients above 0.8 indicating no multicollinearity problems among independent variables that would bias the regression results.

#### ***Value Relevance of Fair Value Hierarchy Levels***

Table 4 shows regression coefficients of fair value hierarchy measurement which are interpreted as a direct test of investors' perceived reliability of fair value earnings. The regression coefficients of  $FVAL1_{it}$  to  $FVAL3_{it}$  were positive based on coefficients of 0.23, 0.31 and 0.17.  $FVAL1_{it}$  and  $FVAL2_{it}$  were statistically significant at 1 and 10 percent respectively, but  $FVAL3_{it}$  was not. Based on these coefficients, these results suggest that fair value measured at the Level 3 ( $FVAL3_{it}$ ) was not value relevant in the NGX market as compared to  $FVAL1_{it}$  and  $FVAL2_{it}$ . The insignificance of  $FVAL3_{it}$  in explaining SP could be as a result of reliability trade-off arising from subjectivity in measurement of fair value assets. This finding supports valuation theory when viewing investors to be rational decision makers. This result indicates that assets measured at Level 3 were more likely to be discounted by the investors in firms' equity valuation and hence less value relevant. This result is contrary to Ozemoya and Mailafia (2021) that document value relevance of unobservable inputs

***Table 4***

*The Value Relevance of Fair Value Hierarchy Levels (n=205).*

Variable	Sign	Coef.	Std Error	t	VIF
CONS	+/-	0.28	0.13	4.06***	-
BVE_ $S_{it}$	+	0.43	0.19	2.29**	1.91
NI_ $S_{it}$	+	0.56	0.47	2.46**	1.32
FVAL1_ $S_{it}$	+	0.23	0.11	3.34***	1.01
FVAL2_ $S_{it}$	+	0.31	0.25	1.72*	1.14
FVAL3_ $S_{it}$	+	0.17	0.18	0.73	1.01
LNI_ $it$	-	-0.07	0.29	-0.69	1.03
LNI*NI_ $S_{it}$	-	0.11	0.14	0.55	1.04
				12.11**	
F-statistics				*	
Observations		197			
R <sup>2</sup>		26.19%			
Mean VIF					1.11
Model Specification Test		$\hat{u}$		$\hat{u}^2$	
P-value		0.001		0.605	

*Notes:* Table 4 provides the regression result on fair value hierarchy levels.  $BVE_{it}$  = per share the book value of common equity;  $NI_{it}$  = net income per share;  $LNI_{it}$  is an indicator variable which equals 1 if earnings is negative and 0 otherwise;  $LNI_{it} * NI_{it}$  is an interaction terms for loss firms  $FVAL1_{it}$ ,  $FVAL2_{it}$  and  $FVAL3_{it}$  denote Level 1 to 3 fair value measures and subscript  $i$  and  $t$  refer to firm and year.

\*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels respectively.

Findings presented above corroborate previous studies on the reliability of fair value earnings using hierarchy levels as a surrogate (Goh et al., 2009; Kolev, 2010; Song et al., 2010; Lu & Mande, 2014; Well & Badenhorst, 2022; Alkali et al., 2023). Like Kolev (2008), Goh et al. (2009), and Song et al. (2010), evidence presented in this study indicates that Level 3 fair values

suffers reduced valuation. This position reinforces evidence of increased cosmetic accounting practice associated with unobservable input measurement (Adeyemi & Kargi, 2022; Alkali et al., 2023). Thus, the result of classifying three categories of fair value gains and losses into hierarchy levels suggests that investors perceived Level 2 fair values as significantly more value relevant than level 3, but less value relevant than Level 1. It therefore concluded that fair value measurement based on the quoted price in an active market and observable inputs were greater in terms of their value relevance compared to unobservable inputs. Overall, the reduced reliability of mark-to-model fair values may outweigh its intent of true values.

Level 1 (FVAL1) was positively priced in the Nigerian market. This result shows that investors viewed fair value gains and losses that utilized quoted prices in active markets to be reliable and need less of corporate governance mechanisms. Level 2 (FVAL2) that potentially represents the middle ground reliability is positively priced for both low and strong governance firms. Nevertheless, the value relevance of FVAL2 was enhanced given the strength of firm's corporate governance mechanism. Consistent with decreasing reliability as fair value hierarchy became less verifiable, Level 3 (FVAL3) was not positively priced. Thus, H1a which hypothesised that fair value hierarchy using the quoted price and observable inputs is greater than the unobservable inputs in the NGX market is therefore accepted.

The result presented above are robust given the link test for model specification which indicates non bias inference due to specification errors. The  $\hat{u}$  values, which are the predicted value of the models, are significant as expected. Likewise, the  $\hat{u}^2$  are insignificant suggesting that the models are correctly specified (Pregibon, 1980). Thus, estimating SP as a function of the book value of equity, net income and fair value hierarchy levels is appropriate in testing the value relevance of fair value hierarchy information in Nigerian.

### **CONCLUSION AND RECOMMENDATION**

Using data of firms listed on the NGX, this study investigates the value relevance of fair value hierarchy information, and whether the corporate governance mechanism influences the value relevance of hierarchy levels. The fact that fair value gains and losses recognised in other comprehensive income are generated using different fair value hierarchy information, it is natural to expect superior value relevance of a more reliable measure (FVAL1) and middle ground measure (FVAL2). Because information asymmetry is expected to be high for a less reliable measure, FVAL3 could suffer reliability concerns. Consistent with these assumptions, findings documented in this paper reveals that FVAL1 (Level 1) and FLVA2 (Level 2) were positive and significant. A fair value hierarchy based on Level 3 was positive, but not statistically significant for the sample examined. These findings offer some refresh insight on the direct test of reliability of multiple fair value gains and losses grouped based on hierarchy levels.

Thus, this study expands the understanding of the value relevance of fair value hierarchy information. What is common in the previous studies is a classification into hierarchy levels using one category of fair value gains and losses or a classification based on the perceived degree of subjectivity. Unlike previous studies that are mostly on hierarchy level of financial instruments, hierarchy classification in this study was based gains and losses on non-current assets, gains and losses on available-for-sale financial securities and actuarial gains and losses on defined benefit plans. While hierarchy levels provide a more direct test of fair value gains and losses, it is devoid of criticism that such approach could not exactly measure reliability as compared to the experimental method. Research techniques employing experimental



economics methodology, interviews and case study might more directly test the reliability of hierarchy levels, hence, future research is desire to investigate these potentials.

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