CAN THE SWITCH FROM FAIR VALUE METHOD TO COST METHOD FOR PLANT ASSET VALUATION BE JUSTIFIED?

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ABSTRACT

International Accounting Standards (IAS) No. 16 allows companies to use either the fair value method or the cost method for plant asset valuation. Once an entity selects one of the two methods, a switch is permitted only if it results in a more appropriate valuation, which, according to the International Accounting Standards Board (IASB), is highly unlikely for a switch from the fair value method to the cost method. Using a sample of firms that adopted IAS No.16's fair value method, we document significant evidence indicating that investors discount plant assets measured at fair value. Furthermore, investors also discount fair value firms' other assets and liabilities. Finally, when fair value firms switch to the cost method, the value relevance of their accounting amounts improves significantly. Taken together, the evidence is consistent with the view that investors perceive the fair value of plant assets to be less reliable and, thus, place less weight on it in equity valuation. In addition, the improved value relevance in the post-switch period justifies the switch by many fair value firms to the cost method.

Keyword: International Accounting Standards (IAS) No. 16, *International Accounting Standards Board (IASB)*

INTRODUCTION

Under International Accounting Standards (IAS) No. 16, "*Property, Plant, and Equipment (PPE)*," companies can use either the fair value method or the cost method for plant asset valuation subsequent to acquisition. While a company may switch from one method to the other, the International Accounting Standards Board (IASB) encourages the use of the fair value method and indicates that a switch from the fair value model to the cost model would be hard to justify (IASB, 2008). Despite IASB's encouragement and the substantial theoretical benefits attributed to fair value accounting in prior literature (Sharpe and Walker, 1975; Standish and Ung, 1982; Aboody et al., 1999; Muller III et al., 2008), the fair value method is rarely used for plant asset valuation. Christensen and Nikolaev (2008) find that only 3% of Germany and UK companies use the fair value method for plant asset valuation under International Financial Reporting Standards (IFRS). Furthermore, when presented with an opportunity to switch, only 1% of historical cost firms switched to the fair value method, whereas 44% of fair value firms switched to the cost method. The objective of this study is to examine the value relevance of fair value firms' accounting amounts and how the value relevance changes when fair value firms switch to the cost method.

We first test the value relevance of plant assets reported at fair value. Unlike financial assets, for which quoted prices are usually available in active markets, active market prices do not exist for plant assets in most cases. Instead, the fair value of plant assets must be

estimated based on firm-generated inputs, which may introduce both intrinsic measurement errors and intentional biases. The firm-generated, unobservable inputs also create an information asymmetry between managers and investors (Song et al. 2010; Landsman 2007; Penman 2007). To the extent that investors perceive greater uncertainty in the fair value estimates of plant assets and suspect that these estimates are intentionally biased, they would put less weight on these estimates in valuation, which would reduce the value relevance of plant assets. In addition, if investors perceive the selection of the fair value method for plant asset valuation as opportunistic, they may also put less weight on fair value firms' other assets and liabilities in equity valuation.

Next, we examine how the value relevance of accounting amounts changes when fair value firms switch to the cost method. Many fair value firms in our sample switched to the cost method during the sample period. When a company makes a significant change in its accounting policy, it sends a signal to the market. If investors are concerned that managers may use the reporting discretion opportunistically under IAS No. 16's fair value method, a switch to the cost method signals the firms' commitment to limiting themselves of reporting discretions. Thus, we expect the value relevance of switching firms' accounting amounts to improve in the post-switch period.

We assess the value relevance of fair value firms' accounting amounts using a modified Ohlson (1995) model which has been used extensively in the literature. Based on a sample of firms that adopted IAS No. 16's fair value method for the period of 2000 to 2009,[1] we find that investors discount plant assets measured at fair value. Furthermore, investors also discount fair value firms' other assets and liabilities. Finally, when fair value firms switch to the cost method, the value relevance of their accounting amounts improves.[2] Taken together, our findings do not support the argument that the fair value method is superior to the cost method for plant assets valuation. Instead, the evidence is more consistent with the view that investors are concerned about the reliability of fair value estimates based on firm-generated inputs and put less weight on fair value firms' accounting amounts in equity valuation. The improved value relevance of accounting amounts when fair value firms switch to the cost method is consistent with the suggestion that investors perceive the switch as a signal of the firms' commitment to limiting themselves of reporting discretions. Thus, our findings provide an explanation for the rare use of IAS No. 16's fair value method and a justification for the switch to the cost method by many fair value firms.

IASB's move towards more fair value measures over the last two decades has inspired numerous studies to examine the value relevance of fair value measurement (Barth et al. 1996; Barth and Clinch 1998; Barlev and Haddad 2007; Missonier-Piera 2007). However, despite the on-going debate regarding IAS No. 16's fair value method, there is little direct evidence on the value relevance of fair value estimates for plant assets.[3] We contribute to the literature by documenting significant evidence regarding the value relevance of the fair value estimates under IAS No. 16. Contrary to the popular belief, we find that plant assets measured at fair value are perceived by investors as less informative than the cost measures, and are discounted by investors in equity valuation. Moreover, the value relevance of fair value firms' accounting amounts improves when they switch to the cost method. Our findings are consistent with Khurana and Kim (2003) who find that fair value measures of not actively traded loans and deposits were less informative than historical cost measures. Our findings are also consistent with Song et al. (2010), who find evidence that fair value of financial assets based on firm-generated inputs are less value relevant. Our findings differ from some early fair value studies of non-financial assets (Barth & Clinch, 1998; Dietrich et al., 2000; Lin and Peasnell 2000). We attribute the difference to two significant differences in research settings. First, we examine the value relevance of fair value estimates under IAS No. 16 whereas Barth and Clinch (1998) and Dietrich et al. (2000) studied fair value reporting under

Australia and UK GAAP, respectively. Second, both the UK and Australia are developed economies and have a common law legal origin with high investor protection, whereas our sample observations are from both developed and developing economies with both common law and code law legal origins and different levels of investor protection. Prior studies find that accounting quality differs with respect to stages of economic development, legal origins, and levels of investor protection (Street & Gray, 2001; Barth et al., 2012; Yip & Young, 2012; Eccher & Healy, 2003).

We also contribute to the policy debate on fair value accounting for plant assets. Christensen and Nikolaev (2008) find that total assets and shareholders' equity, on average, are 31% and 88% higher, respectively, by applying fair value method instead of historical cost accounting for plant asset valuation. These large economic differences in plant asset valuation highlight the importance of valuation methods. Our evidence indicates that investors perceive fair value estimates based on firm-generated inputs as less reliable, which explains the rare use of fair value accounting for plant assets in practice and justifies the switch to cost method by many fair value firms. The findings highlight the need for additional implementation guidelines from IASB to enhance the value relevance of fair value estimates.

The rest of the study is organized as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 describes the sample selection procedures and the data. Section 4 presents the tests results. The last section concludes the paper.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Over the last two decades, IASB has moved toward increased use of fair values in asset and liability measurement for financial reporting. However, despite the substantial theoretical benefit of fair value accounting, IAS No. 16's fair value method is rarely used for plant asset valuation in practice. Furthermore, when presented with an opportunity to switch, 44% of fair value firms switched to the cost method (Christensen and Nikolaev, 2008). This study examines how the value relevance of accounting amounts changes when fair value firms switch to the cost method, and attempts to provide a rational explanation for the rare use of IAS No. 16's fair value method from equity investors' perspective.

Fair value versus historical cost for plant asset valuation is one of the most debated issues in the accounting literature (Paton, 1932; Fabricant, 1936; Schipper, 2005; Ball and Shivacumar, 2006; Christensen and Nikolaev, 2013; Watts, 2006; Laux and Leuz, 2009, Hail et al., 2010). At the center of the debate is whether plant assets' fair value can be reliably estimated based on firm-generated inputs. Despite the on-going debate, however, there is little direct empirical evidence on value relevance of plant assets measured at fair value. Prior fair value studies generally focus on financial assets in the banking industry, where verifiable fair values are readily available from actively traded markets. When no quoted price is available in active markets, Khurana and Kim (2003) find that fair value measures of not actively traded loans and deposits were less informative than historical cost measures. Using financial assets and liabilities of the banking industry, Song et al. (2010) also find fair value estimates based on firm-generated inputs are less value relevant than those based on observable market prices.

Unlike financial assets and liabilities of the banking industry, for which quoted prices are generally available in active markets, active markets do not exist for plant assets in most cases. Instead, the fair value of plant assets needs to be estimated based on firm-generated inputs. Such firm-generated inputs may introduce both intrinsic measurement errors and intentional biases. Specifically, because of the lack of observable market prices, fair value estimates are subject to greater measurement errors. Furthermore, the subjective nature of firm-generated inputs gives managers more discretions and is prone to increased management

manipulations. The firm-generated, unobservable inputs also create an information asymmetry between managers and investors (Song et al. 2010; Landsman 2007; Penman 2007; Benston 2008). To the extent that investors perceive greater uncertainty of the fair value estimates of plant assets, they would adjust the discount rate in valuing reported plant assets measured at fair value, which would result in the coefficient estimate for plant assets to be less than its theoretical value of 1. Furthermore, if investors suspect that fair value estimates are intentionally biased, they would put even less weight on these estimates in valuation, which would further reduce the coefficient estimate of plant assets. This leads to our first hypothesis (in alternative form):

H1: The coefficient estimate of plant assets measured at fair value is less than its theoretical value of +1.

Under IAS No.16's fair value method, plant assets are revalued each period with the resulting revaluation surplus directly credited to shareholders' equity. In subsequent periods, the difference between depreciation based on the new, revalued carrying amount and depreciation based on the asset's original cost goes directly to retained earnings (and reduces the revaluation surplus at the same time). Any remaining revaluation surplus is transferred to retained earnings when the plant asset is disposed of. It becomes apparent that the primary effect of the revaluation is on the balance sheet and that there is little effect on the income statement. Prior studies find that the selection of fair value method for plant asset valuation is primarily motivated by debt market considerations. For example, Christensen and Nikolaev (2008) find that by using fair value method for plant asset valuation, companies' total assets and equity on average are 31% and 88% higher than that of comparable historical cost firms. While some managers may use fair value estimates to communicate valuable inside information to the market (e.g., Barth et al. 1998), the evidence in prior literature overall suggests that managers manipulate such inputs that are not at investors' best interest (e.g., Aboody et al. 2006; Beaver and Venkatachalam 2003). If investors perceive the selection of fair value method for plant assets as opportunistic and suspect that management uses the reporting discretions to manipulate reported numbers, they would put less weight on fair value firms' other assets and liabilities. Furthermore, when fair value firms switch to the cost method, they send a signal to the market of the firms' commitment to limiting themselves of the reporting discretions. Thus, we expect the value relevance of fair value firms' accounting amounts to improve after the switch. This leads to our second hypothesis (in alternative form):

H2: The value relevance of accounting amounts improves when fair value firms switch to the cost method.

However, there are serious arguments against our predictions. Proponents of IAS No. 16's fair value method suggest that fair value of plant assets provides users with timely and transparent information for making economic decisions (Hitz 2007). It is argued that fair value provides a more complete representation of the underlying economic value than the cost method (Eccher et al., 1996; Herrmann et al., 2006), and is less vulnerable to management manipulation (Barlev & Haddad, 2003). Furthermore, if the majority of fair value firms use firm-generated inputs to communicate useful management inside information to investors, the value relevance of fair value firms' accounting amounts may decrease when they switch to the cost method. Thus, it is ultimately an empirical issue.

SAMPLE SELECTION AND THE DATA

To test the value relevance of fair value estimates for plant assets under IAS No.16, we first identify companies that prepare IFRS-based consolidated financial statements. We then identify companies that actually adopted IAS No. 16's fair value method for plant asset valuation. In order to perform the cross-sectional equity model regression, financial, pricing, and exchange rate data are required. We extract financial data from Compustat Global Industrial tape, pricing data from Compustat Global Issue tape, and exchange rate data from Compustat Global Currency tape. Firms with missing data were deleted. We winsorized all variables at 5% level to mitigate the effects of outliers on our inferences. This procedure yields 1,696 firm-year observations from 237 firms for the period of 2000 to 2009. Consistent with Christensen and Nikolaev (2008) and Hlaing and Pourjalali (2012), we find firms that adopted IAS No.16's fair value method for plant asset valuation account for only 16% of IFRS firms during our sample period. Sample distribution by country is presented in Table 1.

Table 1
NUMBER OF OBSERVATIONS BY COUNTRY

Country	*Number of Observations*	*%*
PERU	163	9.6%
SWITZERLAND	124	7.3%
FRANCE	111	6.5%
SWEDEN	111	6.5%
CHINA	110	6.5%
FINLAND	95	5.6%
BERMUDA	90	5.3%
DENMARK	86	5.1%
TURKEY	78	4.6%
ITALY	72	4.2%
UK	62	3.7%
OTHERS	594	35.0%
TOTAL	1,696	100%

Sample descriptive statistics of regression variables are presented in Table 2. The book value of net assets is negative for some companies because plant assets are excluded from the total assets.

Table 2
SUMMARY DESCRIPTIVE STATISTICS
n=1,696

Variable		*Mean*	*Std Dev*	*Minimum*	*Maximum*
MVE		2,680.5	8,625.8	3.7	70,842.3
TA		3,451.5	12,065.1	1.4	240.492.1
PA		2,192.6	6,724.5	0.6	45,987.0
TL		3,704.2	12,187.1	0.05	251,397.1
NA		-168.4*	2,471.1	-15,166.3*	8,991.1
INTANG		505.8	1,804.5	0	13,598.2
All means and standard deviations are in millions of US dollars. Variable definitions are as follows:					
MVE	Market value of equity				
TA	Total assets excluding plant assets				
PA	Plant assets				
TL	Total liabilities				
NA	Net assets (*TA* - *TL*) excluding plant assets				
INTANG	Intangible assets				
* *NA* value is negative for some companies because plant assets were excluded from the computation					

Table 3
PEARSON CORRELATIONS AMONG REGRESSION VARIABLES

n=1,696						
	TA	*PA*	*TL*	*MVE*	*NA*	*INTANG*
TA	1.00					
PA	.82*	1.00				
TL	.99*	.81*	1.00			
MVE	.58*	.62*	.52*	1.00		
NA	.73*	.57*	.61*	.65*	1.00	
INTANG	.74*	.66*	.72*	.47*	.60*	1.00

Variable definitions are as follows:

MVE	Market value of equity
TA	Total assets excluding plant assets
PA	Plant assets
TL	Total liabilities
NA	Net assets (TA - TL) excluding plant assets
INTANG	Intangible assets

*denotes p-vales>0.0001

Correlation coefficients of the regression variables are presented in Table 3. Consistent with the fundamental accounting equation, there is a high correlation between total assets (excluding plant assets) and total liabilities.

EMPIRICAL TESTS AND RESULTS

Test of the Value Relevance of Plant Assets' Fair Value Estimates (H1)

Accounting information is considered value relevant when it is associated with market value of equity (Barth et al. 2001). To test the value relevance of plant assets' fair value estimates under IAS No. 16, we estimate the association between plant assets measured at fair value and stock prices using a modified Ohlson (1995) model which has been used extensively in the literature. Specifically, we estimate the following regression equation:

$$\frac{MVE_{it}}{NSO_{it}} = \alpha_0 + \alpha_1 \frac{TA_{it}}{NSO_{it}} + \alpha_2 \frac{PA_{it}}{NSO_{it}} + \alpha_3 \frac{TL_{it}}{NSO_{it}} + \alpha_4 \frac{NI_{it}}{NSO_{it}} + \varepsilon_{it} \qquad (1)$$

Where *MVE* is the market value of equity; *PA* is the reported plant assets measured at fair value; *TA* is total assets other than plant assets; *TL* is total liabilities, and *NI* is the net income. *NSO* is the number of shares outstanding used as a scaling factor to mitigate the heteroscedasticity problem of regression variables. We use number of shares outstanding instead of the book value or market value of equity to scale sample data because Barth and Clinch (2009) find that share-based deflation performed the best in reducing the scale effect in modified Ohlson (1995) model. Our primary focus is on the coefficient estimate of plant assets, α_2. If plant assets measured at fair value under IAS No. 16 accurately reflect their underlying economic value, the coefficient estimate for plant assets is expected to be close to its theoretical value of 1.[4] On the other hand, if investors are concerned about the reliability of fair value estimates, they will put less weight on the fair value estimates in equity valuation, resulting in a coefficient of less than 1.

Since we use panel data pooled across firms and over time, uncorrelatedness of regression residuals may not hold because of both market-wide shocks that induce correlation between firms and persistent firm-specific shocks that induce correlation over time (Thompson, 2011). To ensure that our results are robust to simultaneous correlation along the two dimensions, we adjust standard errors for correlation across firms and over time by clustering two ways (firm and time) using Petersen's two-way clustered method. We compute covariance estimator by adding an estimator that clusters by firms to the estimator

that clusters by time and subtracting the usual heteroscedasticity-robust OLS covariance matrix. Regression results of equation 1 from two-way clustered analysis are reported in Table 4.

All coefficient estimates have the predicted signs. The four independent variables explained 49.2 percent of cross-sectional variations in the market value of sample firms' equity. However, the coefficient estimate for plant assets, α_2, is 0.081, which is significantly less than its theoretical value of 1. The result is consistent with the view that investors are concerned about the reliability of fair value estimates and put less weight on these estimates in equity valuation. Furthermore, the coefficient estimates for fair value firms' other assets and liabilities are 0.222 and -0.122, respectively, which are also significantly less than their theoretical values of 1 and -1. The evidence suggests that investors' concern over managers' reporting discretion in firm-generated inputs spills over to other assets and liabilities. Thus, investors also place less weight on fair value firms' other assets and liabilities in equity valuation.

Table 4
REGRESSION RESULTS - COMPANIES THAT ADOPTED IAS NO.16'S FAIR VALUE MODEL FOR PLANT ASSET VALUATION

$$\frac{MVE_{it}}{NSO_{it}} = \alpha_0 + \alpha_1 \frac{TA_{it}}{NSO_{it}} + \alpha_2 \frac{PA_{it}}{NSO_{it}} + \alpha_3 \frac{TL_{it}}{NSO_{it}} + \beta_1 \frac{NI_{it}}{NSO_{it}} + \varepsilon_{it}$$

Variable	*Predicted Sign*	*Coefficient Estimates*	*t-statistic*
Intercept	?	8.179	6.26***
TA	+	0.222	4.07***
PA	+	0.081	1.46
TL	-	-0.122	-1.78*
NI	+	4.195	13.88***
Adj. R^2	0.492		
No. of observations	1,696		

*, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively.
Variable definitions are as follows: MVE is market value of equity; TA is total assets excluding plant assets; PA is plant assets; TL is total liabilities; NI is net income; NSO is number of shares outstanding.

A potential concern with the regression results reported in Table 4 is the high correlation between two independent variables, namely total assets (*TA*) and total liabilities (*TL*), which is a common issue for research studies using the equity valuation model. One approach frequently used in the literature to mitigate the problem of multicollinearity due to the high correlation among independent variables is to discard some of the highly correlated independent variables. Since the regression model in this study is based on the accounting identity, a logical choice is to use net asset (*NA*), which equals total assets minus total liabilities, to replace the two highly correlated independent variables. Specifically, the following regression equation is estimated:

$$\frac{MVE_{it}}{NSO_{it}} = \alpha_0 + \alpha_1 \frac{PA_{it}}{NSO_{it}} + \alpha_2 \frac{NA_{it}}{NSO_{it}} + \alpha_3 \frac{NI_{it}}{NSO_{it}} + \varepsilon_{it} \qquad (2)$$

The regression results using equation 2 is presented in Table 5. The results are consistent with those reported in Table 4. Specifically, the coefficient estimate for plant assets is 0.310, which is significantly less than its theoretical value of 1. In addition, the coefficient estimate for net assets is 0.745, which is also significantly less than its theoretical value of 1. In summary, the regression results in Tables 4 and 5 are consistent with the argument that investors are concerned about the reliability of plant assets' fair value estimates and put less weight on them in equity valuation. The evidence shows that investors also

discount fair value firms' other assets and liabilities, indicating that investors' concern over potential opportunistic use of the reporting discretion spills over to fair value firms' other assets and liabilities.

Table 5
REGRESSION RESULTS FROM NET ASSET MODEL - COMPANIES THAT ADOPTED IAS NO.16'S FAIR VALUE MODEL FOR PLANT ASSET VALUATION

$$\frac{MVE_{it}}{NSO_{it}} = \alpha_0 + \alpha_1 \frac{PA_{it}}{NSO_{it}} + \alpha_2 \frac{NA_{it}}{NSO_{it}} + \beta_1 \frac{NI_{it}}{NSO_{it}} + \varepsilon_{it}$$

Variable	*Predicted Sign*	*Coefficient Estimates*	*t-statistic*
Intercept	?	8.179	6.26***
PA	+	0.310	8.70***
NA	+	0.745	9.54***
NI	+	3.614	12.02***
Adj. R^2	0.506		
No. of observations	1,696		

*, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. Variable definitions are as follows: MVE is market value of equity; NA is net assets which equals to total assets excluding plant assets minus total liabilities; PA is plant assets; NI is net income; NSO is number of shares outstanding.

Test of Value Relevance When Fair Value Firms Switch to the Cost Method (H2)

In this section, we test how switching from the fair value method to the cost method affects the value relevance of switching firms' accounting amounts. Forty-five percent of the fair value firms in our sample switched to the cost method during the sample period. This allows us to compare the value relevance of cost versus fair value of plant assets without the need to control for firm-specific characteristics because each firm acts as its own control (Barth et al., 2008). We didn't perform this test for firms switching from the cost method to the fair value method because too few firms made such switches during the sample period, which is consistent with Christensen and Nikolaev (2008) who found that only 1% of historical cost firms switched to the fair value method when they were allowed to.

Table 6
REGRESSION RESULTS - COMPANIES THAT SWITCHED FROM THE FAIR VALUE METHOD TO THE COST METHOD FOR PLANT ASSET VALUATION

$$\frac{MVE_{it}}{NSO_{it}} = \alpha_0 + \alpha_1 \frac{TA_{it}}{NSO_{it}} + \alpha_2 \frac{PA_{it}}{NSO_{it}} + \alpha_3 \frac{TL_{it}}{NSO_{it}} + \beta_1 \frac{NI_{it}}{NSO_{it}} + \varepsilon_{it}$$

		Column A: Pre-switch period (using the fair value method)		Column B: Post-switch period (using the cost method)	
Variable	*Predicted Sign*	*Coefficient Estimates*	*t-statistic*	*Coefficient Estimates*	*t-statistic*
Intercept	?	31.457	5.02***	17.306	3.15***
TA	+	0.184	1.47	1.205	7.06***
PA	+	0.403	4.37***	0.965	12.07***
TL	-	-0.397	-2.83***	-1.652	-8.70***
NI	+	7.778	13.34***	8.865	15.88***
Adj. R^2		0.522		0.750	
No. of observations		755		460	

*, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. Variable definitions are as follows: MVE is market value of equity; TA is total assets excluding plant assets; PA is plant assets; TL is total liabilities; NI is net income; NSO is number of shares outstanding.

When a company makes a significant change in its accounting policy, it sends a signal to the market. Since observable market prices for plant assets are non-existant in most cases, firms have to rely on unobservable firm-generated inputs under IAS No.16's fair value method, which creates an information asymmetry between investors and managers. If investors are concerned that managers may use this reporting discretion opportunistically, a switch to the cost method sends a signal to the market of managers' commitment to limiting themselves of the reporting discretion. Thus, we expect the value relevance of switching firms' accounting amounts to improve in the post-switch period. To test this, we estimate equation 1 for switching firms for the pre- and post-switch period, respectively. This research design has the benefit of using the pre-switch period as a control for the post-switch period (Barth et al., 2008). Our primary focus is on the regression adjusted R^2. The regression results for the pre- and post-switch periods are reported in Column A and Column B of Table 6, respectively.

All coefficient estimates for both the pre- and post-switch periods have their predicted signs. More importantly, the regression R^2 increased significantly from 0.522 in the pre-switch period to 0.750 in the post-switch period, indicating that the four independent variables explained 43% more of the cross-sectional variations in equity prices when fair value firms switch to the cost method. The difference in R^2 between the pre- and post-switch periods is statistically significant at the 0.01 level, suggesting that the value relevance of switching firms' accounting amounts improves in the post-switch period. Furthermore, the coefficient estimate of plant assets is 0.965 in the post-switch period, which is not statistically significantly different from its theoretical value of 1. In contrast, the coefficient estimate of plant assets is only 0.403 in the pre-switch period. Taken together, the evidence indicates that investors perceive the switch from the fair value method to the cost method as a signal of management commitment to limiting itself of the reporting discretion. The evidence provides a rational explanation to the observation that when allowed, a significant number of fair value firms switch to the cost method whereas very few historical cost firms switch to the fair value method. Although not tabulated, similar results are obtained using the net assets model.

Previous studies find that intangible assets tend to be misstated. To ascertain that our results are not confounded by potential misstatements of intangible assets, we add an additional independent variable of intangible assets, *INTANG*, to our regression. Specifically, the following regression equation is estimated:

$$\frac{MVE_{it}}{NSO_{it}} = \alpha_0 + \alpha_1 \frac{TA_{it}}{NSO_{it}} + \alpha_2 \frac{PA_{it}}{NSO_{it}} + \alpha_3 \frac{INTANG_{it}}{NSO_{it}} + \alpha_4 \frac{TL_{it}}{NSO_{it}} + \alpha_5 \frac{NI_{it}}{NSO_{it}} + \varepsilon_{it} \quad (3)$$

Table 7
REGRESSION RESULTS FOR COMPANIES THAT SWITCHED FROM IAS NO.16'S FAIR VALUE METHOD TO COST METHOD FOR PLANT ASSETS VALUATION – USING INTANGIBLE ASSETS AS AN ADDITIONAL CONTROL VARIABLE

$$\frac{MVE_{it}}{NSO_{it}} = \alpha_0 + \alpha_1 \frac{TA_{it}}{NSO_{it}} + \alpha_2 \frac{PA_{it}}{NSO_{it}} + \alpha_3 \frac{INTANG_{it}}{NSO_{it}} + \alpha_4 \frac{TL_{it}}{NSO_{it}} + \beta_1 \frac{NI_{it}}{NSO_{it}} + \varepsilon_{it}$$

		Column A: Pre-switch period (using the fair value method)		Column B: Post-switch period (using the cost method)	
Variable	*Predicted Sign*	*Coefficient Estimates*	*t-statistic*	*Coefficient Estimates*	*t-statistic*
Intercept	?	30.262	4.83***	9.337	1.89*
TA	+	0.410	3.51***	1.343	11.03***
PA	+	0.394	5.00***	1.080	15.15***
INTANG	+	-0.042	-0.19	2.461	11.96***
TL	-	-0.523	-4.61***	-1.836	-15.09***

NI	+	7.729	12.18***	7.46	14.94***
Adj R^2		0.531		0.802	
No. of observations		755		460	
*, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. Variable definitions are as follows: MVE is market value of equity; TA is total assets excluding plant assets; PA is plant assets; INTANG is intangible assets; TL is total liabilities; NI is net income; NSO is number of shares outstanding.					

The regression results for the pre- and post-switch periods are presented in Column A and Column B of Table 7, respectively. The regression R^2 is higher for both the pre- and post-switch period, indicating that the added intangible asset variable improves the model specification. More importantly, the regression R^2 in the post-switch period (0.802) is 51% higher than that in the pre-switch period (0.531), and the difference is statistically significant at 0.01 level. Moreover, the coefficient estimate of plant assets is 1.080 in the post-switch period, which is not statistically significantly different from its theoretical value of 1, whereas the coefficient estimate in the pre-switch period is 0.394, which remains significantly less than its theoretical value of 1. Finally, the coefficient estimate for intangible assets is 2.461 for the post-switch period, which is significantly greater than its theoretical value of +1. The result suggests that reported intangible assets are significantly understated, which is consistent with the findings in prior studies.

CONCLUDING REMARKS

Despite the substantial theoretical benefits of fair value accounting in the literature, firms rarely use the fair value method for plant asset valuation. The widespread adoption of IFRS not only does not increase the use of fair value method for plant asset valuation, but actually results in a decline in the number of firms using the fair value method. Using a sample of IFRS firms that adopted IAS No. 16's fair value method for plant asset valuation, we find that investors discount plant assets measured at fair value. Furthermore, investors also discount the valuation of fair value firms' other assets and liabilities. Finally, when fair value firms switch to the cost method, the value relevance of their accounting amounts improves. Taken together, the evidence is consistent with the view that investors perceive fair value estimates as less reliable and, thus, place less weight on them in equity valuation. Our findings justify the switch to the cost method by many fair value firms, and also explain the rare use of IAS No.16's fair value method despite of its theoretical superiority. Our evidence highlights the need for additional implementation guidelines from IASB to enhance the value relevance of fair value estimates.

ENDNOTES

1. Consistent with prior research, we find that the majority of IFRS companies didn't choose fair value method for plant asset valuation (Hlaing & Pourjalali, 2012). Only 16% of the IFRS firms in our sample adopted IAS No.16's fair value method during the sample period.
2. We did not test the changes in value relevance for firms switching from cost method to fair value method because there are too few firms switched from cost method to fair value method during the sample period, which is consistent with Christensen and Nikolaev (2013) who find only 1% of historical cost firms switched to fair value while 44% of fair value firms switched to historical cost in their sample.
3. Most fair value studies focus on financial assets in the banking industry, where verifiable fair values are generally readily available. Early studies on value relevance of plant assets' fair value estimates are based on country-specific accounting principles instead of IFRS, and find mixed evidence (Amir et al., 1993; Barth & Clinch, 1998). Wang (2006) examines the value relevance of fixed assets using a small sample from eight developed economies for the year of 1999. Song et al. (2010) examine the value relevance of tier

3 fair value estimates based on firm-generated inputs, but the focus, once again, was on financial assets and liabilities.

4. The predicted theoretical value is based on assumptions that the valuation model is properly specified and the market is efficient, which may not hold. Nonetheless, if plant assets' fair value accurately reflects their underlying economic value as perceived by investors, the coefficient estimate for plant assets should not be significantly different from its theoretical value of 1 (Song et al. 2010). Furthermore, Prior studies find that the coefficient of financial assets is close to its theoretical value of 1when the fair value is based on observable prices in actively traded markets (Song et al. 2010).

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REFERENCES

Aboody, D., Barth, M.E., & Kasznik, R. (1999). Revaluation of fixed assets and future firm performance: Evidence from the UK. *Journal of Accounting & Economics*, *26,* 149-178.

Ahmed, A.S., Kilic, E., & Lobo, G. (2006). Does recognition versus disclosure matter? Evidence from value-relevance of banks' recognized and disclosed derivative financial instruments. *The Accounting Review, 81*(3), 567-588.

Amir, E., Harris, T.S., & Venuti, E.K. (1993). A comparison of the value relevance of U.S. versus non-U.S. GAAP accounting measures using Form 20-F reconciliations. *Journal of Accounting Research*, *31,* 230-264.

Ball, R., & Shivakumar, L. (2006). The role of accruals in asymmetrically timely gain and loss recognition. *Journal of Accounting Research,* (44), 207-242.

Ball, R. (2006). International Financial Reporting Standards (IFRS): pros and cons for investors. *Accounting and Business Research*, 5-27.

Barlev, B., & Haddad, J.R. (2003). Fair value and the management of the firm. *Critical Perspectives on Accounting, 14,* 383-415.

Barlev, B., & Haddad, J.R., (2007). Harmonization, comparability, and fair value accounting. *Journal of Accounting, Auditing & Finance, 22(*3), 493-509.

Barth, M.E., & Clinch, G. (1998). Revalued financial, tangible, and intangible assets: Association with share prices and non-market-based value estimates. *Journal of Accounting Research, 36,* 199-233.

Barth, M.E., & Clinch, G. (2009). Scale effects in capital markets-based accounting research. *Journal of Business Finance and Accounting, 36*(3-4), 253-288.

Barth, M.E., Beaver, W.H., & Landsman, W.R. (1996). Value-relevance of banks' fair value disclosures under SFAS No. 107. *The Accounting Review, 71*, 513-537.

Barth, M.E., Landsman, W.R., & Lang, M.H. (2008). International accounting standards and accounting quality. *Journal of Accounting Research, 46*, 467-498.

Barth, M.E., Landsman, W.R., Lang, M.H., & Williams, C. (2012). Are IFRS-based and US GAAP-based accounting amounts comparable? *Journal of Accounting and Economics, 54,* 68-93.

Barth, M.E., Beaver, W.H., & Landsman, W.R. (2001). The relevance of the value relevance literature for financial accounting standard setting: Another view. *Journal of Accounting and Economics, 31* (1-3), 77-104.

Beaver, W., & Venkatachalam, M. (2003). Differential pricing of components of bank loan fair values. *Journal of Accounting, Auditing & Finance, 18* (1), 41-68.

Benston, G. (2008). The shortcomings of fair value accounting described in SFAS 157. *Journal of Accounting and Public Policy, 27*(2), 101-114.

Christensen, H.B., & Nikolaev, V. (2008). Who uses fair-value accounting for non-financial assets following IFRS adoption? Working paper, University of Chicago.

Christensen, H.B., & Nikolaev, V. (2013). Does fair value accounting for non-financial assets pass the market test? *Review of Accounting Studies, 18, 734–775.*

Dietrich, J.R., Harris, M.S., & Muller, K.A. III, (2000). The reliability of investment property fair value estimates. *Journal of Accounting & Economics, 30*(2), 125-158.

Eccher, E., & Healy, P., (2003). The role of international accounting standards in transitional economies: A study of the People's Republic of China. Working paper, Massachusetts Institute of Technology.

Eccher, E.A., Ramesh, K., &Thiagarajan, S.R. (1996). Fair value disclosure by bank holding companies. *Journal of Accounting & Economics*, *22*, 79-117.
Fabricant, S., (1936). Revaluation of fixed assets, 1925-1934. *National Bureau of Economic Research Bulletin*, 62.
Hail, L., Leuz, C., & Wysocki, P.D., (2010). Global accounting convergence and the potential adoption of IFRS by the United States (Part I): Conceptual underpinnings and economic analysis. *Accounting Horizons*, *24*(3), 355-394.
Herrmann, D., Saudagaran, S.M., & Thomas, W.B., (2006). The quality of fair value measures for property, plant, and equipment. *Accounting Forum*, *30*(1), 43-59.
Hitz, J.M. (2007). The decision usefulness of fair value accounting: A theoretical perspective. *European Accounting Review*, *16*, 323-362.
Hlaing, K.P., & Pourjalali, H. (2012). Economic reasons for reporting property, plant, and equipment at fair market value by foreign cross-listed firms in the United States. *Journal of Accounting, Auditing & Finance*, *27*(4), 557-576.
International Accounting Standards Board, (1998, revised 2003). International Accounting Standard No.16, Property, Plant, and Equipment. London, England.
International Accounting Standards Board, (2008). Retrieved from https://www.ifrs.org/issued-standards/list-of-standards/ias-16-property-plant-and-equipment.
Khurana, I., & Kim, M. (2003). Relative value relevance of historical cost vs. fair value: Evidence from bank holding companies. *Journal of Accounting and Public Policy*, *22*(1), 19-42.
Landsman, W. (2007). Is fair value accounting information relevant and reliable? Evidence from capital market research. *Accounting and Business Research*, *37*(1), 19-30.
Laux, C., & Leuz, C. (2009). The Crisis of fair-value accounting, making sense of the recent debate. *Accounting, Organization, and Society, 34* (6-7), 826-834.
Lin, Y.C., & Peasnell, K.V. (2000). Fixed asset revaluation and equity depletion in the UK. *Journal of Business Finance & Accounting*, *27*, 359-394.
Missonier-Piera, F. (2007). Motives for fixed-asset revaluation: An empirical analysis with Swiss data. *The international Journal of Accounting*, *42*(2), 186-205.
Muller, K.A. III, Riedl, E.J., & Sellhorn, T. (2008). Consequences of voluntary and mandatory fair value accounting: evidence surrounding IFRS adoption in the EU real estate industry. Harvard Business School, working paper, 2008.
Ohlson, J.A. (1995). Earnings, book values, and dividends in equity valuation. *Contemporary Accounting Research, 11*(2), 661-687.
Paton, W.A. (1932). *Accountants' Handbook. Vol. 2.* New York: The Ronald Press Company.
Penman, S.H. (2007). Financial reporting quality: Is fair value a plus or a minus? *Accounting and Business Research, 37* (1), 33-44.
Schipper, K., (2005). Fair values in financial reporting. Retrieved from http://fars.org/2005AAAFairValue Kschipper.pdf.
Sharpe, I.G., & Walker, R.G. (1975). Asset revaluation and stock market prices. *Journal of Accounting Research, 13* (2), 293-310.
Song, C., Thomas, W.B., & Yi, H. (2010). Value relevance of FAS No. 157 fair value hierarchy information and the impact of corporate governance mechanisms. *The Accounting Review, 85* (4), 1375-1410.
Standish, P.E., & Ung, S.I. (1982). Corporate signaling, asset revaluations and the stock prices of British companies. *The Accounting Review*, *57* (4), 701-715.
Street, D.L., & Gray, S.J. (2001). Observance of international accounting standards: Factors explaining non-compliance. ACCA Research Report No. 74, The Association of Chartered Certified Accountants.
Thompson, S.B. (2011). Simple formulas for standard errors that cluster by both firm and time. *Journal of Financial Economics*, (*99*), 1-10.
Wang, Z. (2006). *Upward revaluation of fixed assets. Journal of Business and Economics Research*, *4*(1).
Watts, R.L. (2006). What has the invisible hand achieved? MIT Sloan School of Management working paper.
Yip, R.W.Y., & Young, D. (2012). Does mandatory IFRS adoption improve information comparability? *The Accounting Review*, *87*, 1767-1789.