“The effect of IFRS adoption on the value relevance of accounting information: evidence from South Korea”

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THE EFFECT OF IFRS ADOPTION ON THE VALUE RELEVANCE OF ACCOUNTING INFORMATION: EVIDENCE FROM SOUTH KOREA

Abstract

This study investigates whether the value relevance of accounting information was changed after IFRS adoption in South Korea. Related prior studies have found mixed empirical evidence depending on research methodologies or research periods. Moreover, the effect of IFRS adoption on value relevance can be different between Korean stock markets (KSE and KOSDAQ) because they have different characteristics. Also, the main financial statements reported by Korean firms had changed from individual financial statements to consolidated financial statements after IFRS adoption. Thus, this study analyzes the effect of IFRS adoption on the value relevance of individual and consolidated accounting numbers expanding research periods (5 years before and after IFRS adoption) and comparing changes in explanatory powers of Ohlson (1995) model on each listing market. The empirical results indicate that the value relevance of Korean listed firms generally decreased after IFRS adoption. However, the value relevance of KSE listed firms decreased, while the value relevance of KOSDAQ listed firms increased after IFRS adoption. In addition, it was found that the effects of IFRS adoption on value relevance of individual and consolidated financial information were different depending on listed markets. This implies that different level of demand for information environment may induce differential effects of IFRS adoption on value relevance.

Keywords IFRS, value relevance, comparability, accounting information, KSE, KOSDAQ

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INTRODUCTION

South Korea (hereafter, Korea) had developed its own accounting standards (Korean GAAP) and applied it to all firms including listed and unlisted firms until 2010. Korean GAAP had characteristics that they were developed by rule-based approach, which allowed managers' discretion less than IFRS (International Financial Reporting Standards) applying principle-based approach and the main financial statements disclosed under Korean GAAP were not consolidated financial statements, but individual financial statements[1]. Those different characteristics of Korean GAAP had been a major factor, which devaluated accounting transparency of Korean firms and accordingly brought about so-called 'Korea Discount'.

Hence, Korea has fully adopted IFRS since 2011 for enhancing international coordination of accounting standards, accounting transpar-

1 Under Korean GAAP, all Korean firms had to disclose their individual financial statements within 90 days after the closing date of fiscal year prior to disclose consolidated financial statements. Accordingly, most of accounting information users mainly used (timely) individual financial statements rather than consolidated financial statements in making economic decision.

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ency, and eventually the usefulness of accounting information as a solution for 'Korea discount'[2]. If IFRS had these positive effects, stakeholders, as well as firms, would enjoy various benefits by applying IFRS compared with applying local accounting standards (Korean GAAP). And one of the most important benefits could be the increase of value relevance of accounting information (hereafter, value relevance) due to improving usefulness and transparency of accounting numbers.

However, prior studies that investigated the effect of IFRS adoption on value relevance addressed mixed empirical results. For example, Suadiye (2012), Daske et al. (2008) and Barth et al. (2008) reported that IFRS adoption had positive effects on value relevance, while Clarkson et al. (2011), Horton and Serafeim (2010), Hung and Subramanyam (2007) presented mixed effects or found no clear evidence of IFRS adoption on value relevance. Relevant researches in Korea also reported mixed empirical results depending on their research methodology and research periods. Ji (2013) found positive effect of IFRS on value relevance, while Choi (2013) and Choi et al. (2013) found little evidence on improving value relevance. Y. Kim and K. Kim (2015) and Park (2016) also reported insignificant effect and positive significant effect of IFRS on value relevance in different analysis period.

These results can be attributed to a possibility that firms' financial status and performance might not be properly reflected in the accounting information under IFRS, because it's too complex to apply and allows managers' discretion on accounting choices more than local GAAP. For example, standard for financial instruments (IAS 39) had been replaced with IFRS 9, since it is too complex and obscure to interpret and apply. Besides, the comparability and consistency of accounting data under IFRS may be lowered when managers selectively apply fair value accounting. So, it is empirical question if value relevance has improved after IFRS adoption.

Recently, Kwon et al. (2017) analyzed various accounting qualities including value relevance and presented improvement of value relevance after IFRS adoption. However, the result might be influenced not only by adoption of new accounting standards (IFRS) but also by corresponding efforts to higher demand for better information environment (Kwon et al., 2017). So, it is inferred that IFRS adoption would have both positive and negative effect on value relevance depending on how appropriately it is applied. IFRS is principle-based accounting standard in which managements' accounting decision plays more important role than Korean GAAP (K-GAAP), which is rule-based standard. This can lead to either more managers' discretionary accounting choice (Ahmed et al., 2013; Capkun et al., 2016) or better reflection of accounting information on economic outcomes (Barth et al., 2008; Horton et al., 2013; Okafor et al., 2016; Yip and Young, 2012).

In Korea, two separate listing markets (KSE and KOSDAQ) have different characteristics in that KOSDAQ listed firms have relatively smaller size, weaker corporate governance and more agency problem than KSE listed firms (Yoon, 2001; Choi et al., 2010). Accordingly, whether firms listed in two different stock markets with different level of demand for information environment have different IFRS adoption effect on value relevance is quite interesting research issue (Horton et al., 2013; Leuz, 2003).

Hence, this study investigates whether the value relevance of accounting information under IFRS was substantially changed in Korea by expanding sample periods to pre/post 5 years of IFRS adoption using both individual financial statements and consolidated financial statements. Specifically, this study analyzes if there were changes of value relevance between listed markets (KSE and KOSDAQ), as well as types of financial statements (individual and consolidated).

2 Korean government officially runs two stock markets: Korea Stock Exchange (KSE) and Korea Securities Dealers Association Automated Quotation (KOSDAQ). Two stock markets have different characteristics such as firm size, risk, etc. Nevertheless, all listed firms in Korea have applied IFRS mandatorily since 2011 regardless of their listing market. Unlisted firms in Korea still apply Korean GAAP. In addition, the main financial statements disclosed have changed from individual financial statements to consolidated financial statements after IFRS adoption.

The empirical results show that value relevance of total listed firms (total samples) in Korea had decreased after IFRS adoption. However, separating total sample firms into two group according to their listed market, value relevance of KSE-listed firms has weakened after IFRS adoption, whereas value relevance of KOSDAQ-listed firms has improved. Further, consolidated accounting information have more positive effects on value relevance for KOSDAQ listed firms and less negative effects for KSE listed firms. These empirical results imply that the IFRS adoption resulted in both positive and negative impacts on value relevance depending on information environment level, which in turn indicate improvement of the comparability of accounting information between two stock markets in Korea.

This study contributes that it provides empirical evidences that different level of demand for information environment can causes different IFRS adoption effect in terms of value relevance. Moreover, this study investigated relatively long-term effect of IFRS adoption itself, as well as the changing effect of main financial statements on value relevance in Korea. Therefore, results of this study provide further understanding on effects of IFRS adoption to governmental organizations and financial regulators and academics.

1. LITERATURE REVIEW AND HYPOTHESIS

The effect of IFRS adoption on the value relevance has been analyzed in various researches. However, empirical results of prior studies show mixed evidence depending on their research objects such as countries, extent of legal enforcement, reporting incentives, etc. In addition, the value relevance of accounting information can be affected by various factors such as changes in accounting environment (Horton et al., 2013; Leuz, 2003) and quality of accounting information (Ahemd et al., 2013; Capkun et al., 2016; Yip and Young, 2012). Among them, some studies reported positive direct or indirect effect of IFRS adoption on value relevance (Barth et al., 2008; Daske et al., 2008; Horton et al., 2013; Okafor et al., 2016; Yip & Young, 2012).

Specifically, Barth et al. (2008) reported less earnings management and more timely loss recognition under IFRS resulted in higher value relevance of accounting information. And Daske et al. (2008) presented that IFRS adoption or expected IFRS adoption increased firms' liquidity and reduced cost of capital. Especially, these effects tended to be more intensive for voluntary adopters, firms in countries with relatively strict legal enforcement, and firms in countries providing strong incentives for transparent accounting. Okafor et al. (2016) also showed that firms of mandatory IFRS adoption exhibited higher value relevance in Canada. Suadiye (2012), which analyzed Turkish IFRS adoption case, presented evidences that the value relevance of equity and net income improved after IFRS adoption.

However, some studies such as Clarkson et al. (2011), Horton and Serafeim (2010), Hung and Subramanyam (2007), and Kargin (2013) do not provide strong evidence that IFRS adoption had significant positive effects on the value relevance. For example, Horton and Serafeim (2010) investigated IFRS adoption case of UK firms by testing the relationship between net income adjustments information from local GAAP to IFRS and price reaction in the stock market. The study found that positive adjustment from local GAAP net income to IFRS net income resulted in significant market response before the disclosure, as well as after the disclosure, but negative adjustment brought about significant market response only after the disclosure. According to these findings, Horton and Serafeim (2010) insisted that only negative adjustment served as a new information for investors.

Clarkson et al. (2011) analyzed the effects of IFRS adoption in fourteen Australian and European countries and showed that value relevance did not significantly change after IFRS adoption. Specifically, using the traditional linear regression model, the value relevance of equity and net income increased after IFRS adoption for the code law countries, while value relevance of the common law countries decreased after IFRS adoption. However, using non-linear regression model, there was no significant change in value relevance of accounting information after IFRS adoption.

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Kargin (2013) reported that the value relevance of equity was improved after IFRS adoption, whereas the value relevance of net income was not significantly changed after IFRS adoption, consistent with Hung and Subramanyam (2007), which showed only incremental value relevance of IAS adjustment to book value (equity).

IFRS adoption may have negative effect on value relevance because of manager's opportunistic accounting choices. For example, Ahmed et al. (2013) provided evidence that earnings management for income smoothing had increased after mandatory IFRS adoption. Similar to Ahmed et al. (2013), Capkun et al. (2016) showed that income smoothing had increased after IAS/IFRS adoption due to greater flexibility of managers in accounting choices.

Prior studies which analyzed IFRS adoption effect on value relevance in Korea also shows mixed results. Choi (2013) investigated difference in the value relevance between Korean GAAP (local GAAP) and IFRS for KSE-listed firms and showed that there was no significant change in the value relevance after IFRS adoption using both price model and return model. Further, Choi (2013) presented that difference in equity between Korean GAAP and IFRS had significant negative relation with stock price, while difference in net income between the accounting standards had no significant relation with stock price. Choi et al. (2013), using reconciliation adjusted data from K-GAAP to K-IFRS, showed that adjustment to earnings and book value had positive and negative incremental value relevance, respectively. Ji (2013) analyzed KSE listed firms and reported that the value relevance of both equity and net income increased after IFRS adoption unlike Choi (2013) and Choi et al. (2013). However, Choi (2013), Choi et al. (2013), and Ji (2013) had a limitation that the research periods were too short (one year of pre-IFRS and post-IFRS adoption, respectively) to analyze the effects of IFRS 'itself' rather than 'introduction' of IFRS.

Other researches on IFRS adoption and value relevance, such as Y. Kim and K. Kim (2015) and Park (2016) provide important implication that effect of IFRS adoption on value relevance can be differential depending on research periods. Y. Kim and K. Kim (2015) reported that the value relevance of accounting information was not significantly changed for short time (one year of pre- and post-IFRS adoption, respectively), while extending research periods for relatively long time (three years of pre- and post-IFRS adoption periods), the value relevance of Korean listed firms was worsened after IFRS adoption. On the other hand, Park (2016) found increase of value relevance for long time periods after IFRS adoption and decrease of value relevance for short time research periods.

Kwon et al. (2017) analyzed IFRS adoption effect on various accounting qualities in terms of earnings persistence, accounting conservatism, income smoothing and found significant improvement of those accounting qualities after IFRS adoption. Specifically, the results showed less absolute value of accrual-based and real activity-based earnings management estimates, more loss recognition frequency and stronger value relevance after IFRS adoption. Kwon et al. (2017) argued that higher level of accounting information, as well as strong and mandatory enforcement of IFRS, would cause improvement of value relevance. However, Kwon et al. (2017) did not considered at all different level of information environment between two stock markets (KSE and KOSDAQ) in Korea.

In line with this context, Kwon (2018) analyzed value relevance by listed markets and reported improvement of value relevance [increased R^2 from Ohlson (1995) model] as IFRS adoption effect in both listing market subsamples. However, Kwon (2018) showed negatives association between stock price and accounting performances such as net income, operating income, (operating) cash flows, which were unique results in value relevance-related researches. Furthermore, it seems that Kwon (2018) didn't considered the fact that the main financial statements of Korean firms were changed from individual financial statements to consolidated financial statements after IFRS adoption[3]. In other words, it is hard to understand that the improvement of value relevance in Korean listed firms after IFRS adoption were resulted from either the IFRS adoption itself or the change of main financial statements.

3 Kwon (2018) did not clearly state the types of financial statements used in empirical analysis.

Thus, this study empirically investigates whether the value relevance of listed companies in Korea was changed after IFRS adoption by complementing some limitations of prior studies. We establish null hypothesis as follows[4]:

Hypothesis: *Value relevance of accounting information in Korea would not be changed after IFRS adoption compared with pre-IFRS adoption period.*

2. RESEARCH DESIGN

2.1. Research models

The research models for hypothesis testing are as follows:

$$P_{it} = \alpha_0 + \alpha_1 (C) EPS_{it} + \alpha_2 (C) BPS_{it} + e_{it}, \quad (1)$$

$$P_{it} = \alpha_0 + \alpha_1 (C) EPS_{it} + \\ + \alpha_2 (C) BPS_{it} + \mu_{it} + e_{it}, \quad (2)$$

where P_{it} price per share (market price of 90 days after the end of fiscal year), $(C) EPS_{it}$ (consolidated) earnings per share, which calculated as (consolidated) net income divided by number of shares outstanding, $(C) BPS_{it}$ (consolidated) book value per share, which calculated as (consolidated) book value of equity divided by number of shares outstanding, μ_{it} industry fixed effect

This study uses Ohlson (1995) model Equation (1) to test hypothesis. In addition, we set Equation (2) which controls the fixed effect of the industry for robustness of the results of Equation (1). To test the hypothesis, we estimate Equation (1) and Equation (2) on pre-IFRS period and post-IFRS period, respectively, and compare adjusted R-squares from the estimated models for each period[5]. Especially, this study uses data from both individual and consolidated financial statements data for two reasons. First, it allows to find whether changes in value relevance are incurred from the change of main financial statements. Second, it enables to find whether changes in value relevance are consistent regardless of financial statement types.

According to Ohlson (1995), the price of firm's equity is determined by earnings, book value of equity, and other information. The higher value relevance of accounting information, the lower importance of other information. As a result, explanatory power (adjusted *R*-square) of the regression model increases. Therefore, following our null hypothesis, adjusted *R*-squares from the research models should not be different between pre-IFRS period and post-IFRS period.

The effect of IFRS adoption in Korea may vary depending on listing markets (KSE and KOSDAQ), as each market has different characteristics. For example, corporate governance and earnings quality of KSE listed firms are generally superior than KOSDAQ listed firms (Yoon, 2001; Choi et al., 2010). Hence, we estimate the Equation (1) and Equation (2) on sub-samples of KSE and KOSDAQ listed firms, as well as total listed firms.

All listed firms in Korea should disclose financial statements within 90 days after the closing date of fiscal year in conformity to the related law. That is, 90 days are needed to reflect audited accounting information fully on stock price. Thus, this study measures stock price per share P_{it} by market price of 90 days after the end of fiscal year. μ_{it} indicates industry dummy variables, which are measured by middle classification level of Korean Standard Industrial Classification (KSIC).

2.2. Sample selection

To test the hypothesis, this study analyzes all listed firms in Korea from 2006 to 2015, which is intended to include both pre-IFRS period and post-IFRS period enough. Specifically, this study designates 2006–2010 as pre-IFRS period and 2011–2015 as post-IFRS. Sample firms are selected from the following criteria:

1) firms listed in KSE and KOSDAQ from 2006 to 2015;

4 This study establishes null hypothesis due to the different results of related prior studies.

5 We additionally applied non-linear model following Clarkson et al. (2011), which included interaction term between EPS and BPS into the model and the results were similar among the models. We only present results of linear model analysis, because results of non-linear model did not indicate biased results from significant heteroscedasticity. Instead, we present heteroscedasticity-consistent t-value in results of the main analysis.

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Table 1. Descriptive statistics (n = 14,260)

Source: Unit: Korean Won (₩).

Variables		Mean	Std.	Min.	1Q	Med.	3Q	Max.
Panel A. Pre-IFRS period								
KOSDAQ	*P*	6,365	8,828	280	1,890	3,490	7,070	57,700
	EPS	378	1,253	–3,041	–55	201	596	7,590
	BPS	5,447	8,254	92	1,743	3,300	5,643	55,807
KSE	*P*	35,933	84,752	289	2,645	8,880	30,900	613,000
	EPS	2,882	7,348	–10,130	59	640	2,727	47,664
	BPS	31,642	63,109	261	3,401	9,660	30,556	434,455
Panel B. Post-IFRS period								
KOSDAQ	*P*	9,043	13,214	438	2,370	4,600	9,850	85,500
	EPS	345	1,062	–2,655	–67	168	593	5,822
	BPS	5,781	7,379	176	1,854	3,755	6,662	49,321
	CEPS	367	1,124	–2,430	–86	174	603	6,534
	CBPS	6,370	8,288	232	1,974	4,127	7,170	54,238
KSE	*P*	49,450	128,056	438	3,490	11,200	38,400	1,000,000
	EPS	2,232	7,068	–15,963	16	494	2,147	41,279
	BPS	40,310	81,872	234	3,971	10,563	37,337	564,073
	CEPS	2,801	8,241	–13,909	–4	563	2,607	51,371
	CBPS	50,000	102,751	271	4,486	12,060	45,407	687,808

Notes: P denotes stock price; (*C*)*EPS* denotes (consolidated) earnings per share; (*C*)*BPS* denotes (consolidated) book value of equity per share.

2) non-financial firms;

3) firms with closing date of the fiscal year in December;

4) firms without impaired capital, not under administration or delisted firms during;

5) research periods;

6) firms with which data for the analysis are available on KIS-VALUE;

7) all data for testing hypothesis were collected from KIS-VALUE and winsorized at 1% and 99% level, respectively, to eliminate influence of extreme values. The final firm-year observations were 14,260 (n = 14,260).

3. EMPIRICAL RESULTS

3.1. Descriptive statistics and correlation analysis

Table 1 shows descriptive statistics of variables included in hypothesis testing model Equation 1 by listing market sub-samples (KSE, KOSDAQ). Panel A and Panel B of Table 1 present descriptive statistics for pre-IFRS period and post-IFRS period, respectively. In Panel A and Panel B, the averages of all variables of KSE listed firms are much higher than those of KOSDAQ listed firms. In Panel A, the average stock price (*P*), *EPS* and *BPS* of KSE listed firms are ₩ 35,933, ₩ 2,882, and ₩ 31,642, which represents 5.65, 7.60 and 5.81 times higher than those of KOSDAQ listed firms. Panel B presents similar characteristics pattern with Panel A after IFRS adoption, the difference of EPS between KSE and KOSDAQ listed firms is sharply decreased by 24% (from 2,503 to 1,886), while the difference of BPS is remarkably increased by 24% (from 26,195 to 34,525). Also, CEPS and CBPS are higher than EPS and BPS and increased after IFRS adoption for both listed firms.

Table 2 presents Pearson (Spearman) correlations among the variables. In the lower triangles of the matrix, stock price (*P*) has significant positive correlation with EPS and BPS in all cases[6]. However, correlations of stock price with EPS and with BPS of KSE listed firms had dropped after IFRS adoption, whereas those correlations of KOSDAQ listed firms had ascended. Pearson correlations of stock price with CEPS and with CBPS show significantly positive coefficients and results of Spearman correlations also showed similar patterns. The results suggest the evidence that the value relevance

6 This study also performed Variance Inflation Factor (VIF) tests in every regression. Test results showed the highest value of VIF was 2.88. Accordingly, it seems that multicollinearity was not significant.

Table 2. Pearson & Spearman Correlation Matrix (n = 14,260)

Variables		KOSDAQ			KSE		
		P	***(C)EPS***	***(C)BPS***	***P***	***(C)EPS***	***(C)BPS***
Pre-IFRS period	*P*	1.000	0.533	0.671	1.000	0.739	0.896
	EPS	0.556	1.000	0.620	0.812	1.000	0.702
	BPS	0.546	0.625	1.000	0.842	0.783	1.000
Post-IFRS period	***P***	1.000	0.563	0.714	1.000	0.689	0.891
	EPS	0.600	1.000	0.618	0.669	1.000	0.629
	BPS	0.634	0.612	1.000	0.797	0.661	1.000
	P	1.000	0.552	0.716	1.000	0.699	0.900
	CEPS	0.615	1.000	0.604	0.756	1.000	0.627
	CBPS	0.625	0.639	1.000	0.787	0.706	1.000

Notes: The upper triangles (lower triangles) in the matrix represent Spearman (Pearson) correlation coefficients. All correlation coefficients are statistically significant at 1% level. Refer to Table 1 for definitions of variables.

of KOSDAQ listed firms was improved after IFRS adoption, while value relevance of KSE listed firms was decreased.

3.2. Results of hypothesis test

Table 3 and Table 4 provide whether the value relevance of accounting information had changed after IFRS adoption in Korea. Table 3 and Table 4 present test results of Equation (1) and Equation (2), respectively.

In Table 3, the explanatory power (adjusted R2) of the total samples shows 77.5% before IFRS adoption (pre-IFRS period) and 68.6% after IFRS adoption (post-IFRS period, individual financial statements), which decreased by 8.9% points. Analysis using consolidated data shows higher adjusted R^2 than those of individual statements' data, but lower than pre-IFRS period. However, results of the sub-samples (KSE and KOSDAQ) exhibits contrary phenomenon each other. The explanatory power of model for KOSDAQ firms increased by 10.0% point from 37.3% to 47.3% (47.0% for consolidated data) after IFRS adoption, while the explanatory power for KSE firms decreased by 9.8% (7%) points from 76.9% to 67.1% (69.9% for consolidated data). The results of Chow test show all significant F-statistics, which indicates IFRS adoption was structural break-point. That is, the value relevance of accounting information for KOSDAQ

Table 3. Test results of hypothesis using pooled OLS model (Equation (1))

Equation (1)		Pre-IFRS period (2006–2010)		Post-IFRS period (2011–2015) –Ind.		Post-IFRS period (2011–2015) –Con.	
Sample	**Var.**	**Coef.**	**(*t*-stat.)**	**Coef.**	**(*t*-stat.)**	**Coef.**	**(*t*-stat.)**
Total	Int.	702.518*	(1.59)	1023.252*	(1.53)	2027.881***	(3.13)
	(C)EPS	4.443***	(7.39)	4.531***	(6.8)	6.135***	(9.02)
	(C)BPS	0.713***	(9.85)	0.979***	(15.42)	0.627***	(11.29)
	Chow	–		139.84***		33.92***	
	Adj. R^2	0.775 (N = 6,341)		0.686 (N = 7,919)		0.712 (N = 7,919)	
KOS DAQ	Int.	3530.622***	(20.95)	3165.194***	(15.99)	3475.654***	(18.33)
	(C)EPS	2.488***	(9.80)	4.223***	(12.43)	4.281***	(13.84)
	(C)BPS	0.347***	(8.69)	0.763***	(16.05)	0.626***	(15.86)
	Chow	–		270.20***		191.09***	
	Adj. R^2	0.373 (N = 3,535)		0.473 (N = 4,733)		0.470 (N = 4,733)	
KSE	Int.	176.452	(0.21)	–502.375	(–0.34)	596.576	(0.42)
	(C)EPS	4.565***	(7.19)	4.56***	(6.59)	6.208***	(8.8)
	(C)BPS	0.714***	(9.29)	0.987***	(14.76)	0.629***	(10.72)
	Chow	–		55.93***		12.18***	
	Adj. R^2	0.769 (N = 2,806)		0.671 (N = 3,186)		0.699 (N = 3,186)	

Notes: *, *** represent significance at 10 and 1 percent levels, respectively. The t-values were calculated by heteroscedasticity-consistent standard errors. Chow presents Chow's test for structural breakpoints of 6341 (total sample), 3,535 (KOSDAQ), 2,806 (KSE), respectively. Ind. and Con. denote individual and consolidated financial statements, respectively.

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Table 4. Test results of hypothesis using fixed industry effect model (Equation (2))

Equation 2		Pre-IFRS period (2006–2010)		Post-IFRS period (2011–2015) –Ind.		Post-IFRS period (2011–2015) –Con.	
Sample	**Var.**	**Coef.**	**(*t*-stat.)**	**Coef.**	**(*t*-stat.)**	**Coef.**	**(*t*-stat.)**
Total	Int.	–1,013.436	(–0.86)	787.265	(0.49)	–8,692.051***	(–4.31)
	(*C*)*EPS*	4.235***	(7.18)	4.237***	(6.40)	5.922***	(8.84)
	(*C*)*BPS*	0.749***	(10.45)	1.004***	(15.86)	0.639***	(11.6)
	F-test	11.17***		19.07***		14.73***	
	Chow	–		19.19***		8.27***	
	Adj. R^2	0.782 (*N* = 6,341)		0.700 (*N* = 7,919)		0.724 (*N* = 7,919)	
KOS DAQ	Int.	4986.474***	(8.55)	4831.531***	(7.42)	4710.038***	(7.09)
	(*C*)*EPS*	2.421***	(9.62)	3.891***	(11.93)	3.947***	(13.11)
	(*C*)*BPS*	0.359***	(8.73)	0.820***	(17.45)	0.684***	(17.18)
	F-test	3.98***		22.79***		22.73***	
	Chow	–		39.79***		29.69***	
	Adj. R^2	0.387 (*N* = 3,535)		0.521 (*N* = 4, 733)		0.517 (*N* = 4, 733)	
KSE	Int.	–3,684.082*	(–1.86)	–1,590.079	(–0.57)	–19,373***	(–5.43)
	(*C*)*EPS*	4.235***	(6.82)	4.156***	(6.09)	5.898***	(8.64)
	(*C*)*BPS*	0.764***	(10.09)	1.01***	(15.32)	0.641***	(11.34)
	F-test	7.31***		10.95***		8.73***	
	Chow	–		8.72***		4.78***	
	Adj. R^2	0.780 (*N* = 2,806)		0.691 (*N* = 3,186)		0.718 (*N* = 3,186)	

Notes: *, *** represent significance at 10 and 1 percent levels, respectively. The t-values are calculated by heteroscedasticity-consistent standard errors. Chow presents Chow's test for structural breakpoints of 6,341 (total sample), 3,535 (KOSDAQ), 2,806 (KSE), respectively. F-test presents results of F-test under null hypothesis that industry fixed effects were zero. Ind. and Con. denote individual and consolidated financial statements, respectively.

listed firms had strengthened after IFRS adoption, but for KSE listed firms, the value relevance had weakened after IFRS adoption.

Table 4 provides test results of Equation (2) (industry-fixed effect model). After controlling industry effects, empirical results reject our null hypothesis consistent with Table 3. The explanatory power had changed after IFRS adoption for both total samples and sub-samples. Adjusted R^2 decreased by 8.2% (5.8%) points for total samples (from 78.2% to 70.0% for individual data and 72.4% for consolidated data). On the other hand, adjusted R^2 for KOSDAQ firms mounted up by 13.4% (13%) points (from 38.7% to 52.1% for individual data and 51.7% for consolidated data) and dropped down by 8.9% (6.2%) points (from 78.0% to 69.1% for individual data and 71.8% for consolidated data) for KSE firms after IFRS adoption. The results of F-tests reject null hypothesis that industry fixed effects equal zero under 1% significance level and results of Chow tests reconfirm that there were structural break-point in the sample data.

Finally, Table 5 which presents annual time-series trend of adjusted R^2 provides more detailed evidence on those results. In Table 5, adjusted R^2s from Equation (1) and Equation (2) show considerable changes in the value relevance of accounting information after IFRS adoption and those changes are contrasting for KOSDAQ firms and KSE firms in case of using individual financial statements. Adjusted R^2s for KOSDAQ firms during IFRS periods (2011 to 2015) are higher than local GAAP periods (2006-2009) while adjusted R^2s for KSE firms shows in the opposite direction. Moreover, differences of adjusted R^2 between KSE and KOSDAQ firms had gradually mitigated during whole research period. And after 2010 when appeared exceptionally high adjusted R^2s for both KSE and KOSDAQ firms, the gap of R^2s between KSE and KOSDAQ listed firms dropped below 0.2. This result provides more intuitive evidence that difference of value relevance between the listed markets had considerably diminished after IFRS adoption.

Additionally, adjusted R^2s from consolidated financial statements show similar pattern of mitigated gap between two listed market subsamples. However, it is interesting that the gaps of adjusted R^2s between individual and consolidated financial statements during IFRS period are inconsistent for KODAQ listed firms but con-

Table 5. Annual time-series trends of adjusted R^2 by listing market

Type	Year	KOSDAQ(A)		KSE(B)		Diff. [(B)-(A)]	
		Eq. (1)	Eq. (2)	Eq. (1)	Eq. (2)	Eq. (1)	Eq. (2)
Ind.	2006	0.336	0.352	0.741	0.753	0.406	0.402
	2007	0.344	0.357	0.829	0.829	0.485	0.472
	2008	0.307	0.319	0.745	0.752	0.439	0.433
	2009	0.421	0.428	0.762	0.770	0.341	0.343
	2010	0.540	0.553	0.813	0.822	0.273	0.269
	2011	0.487	0.517	0.714	0.723	0.226	0.206
	2012	0.537	0.576	0.674	0.687	0.137	0.111
	2013	0.522	0.555	0.707	0.723	0.185	0.168
	2014	0.532	0.570	0.653	0.665	0.121	0.095
	2015	0.419	0.497	0.639	0.657	0.220	0.160
Con.	2011	0.480	0.511	0.736	0.744	0.256	0.233
	2012	0.482	0.525	0.733	0.741	0.251	0.215
	2013	0.506	0.539	0.724	0.740	0.218	0.201
	2014	0.534	0.570	0.675	0.691	0.141	0.121
	2015	0.427	0.500	0.663	0.678	0.236	0.178
Diff. [Ind.-Sep.]	2011	-0.007	-0.006	0.022	0.021	0.029	0.027
	2012	-0.055	-0.051	0.059	0.054	0.114	0.104
	2013	-0.016	-0.016	0.017	0.017	0.033	0.033
	2014	0.002	0.000	0.022	0.026	0.020	0.026
	2015	0.008	0.003	0.024	0.021	0.016	0.018

Notes: Ind. and Con. denote individual and consolidated financial statements, respectively.

sistent for KSE listed firms. Consolidated accounting data of KSE listed firms shows more explanatory power for stock price than those of individual accounting data. It can be inferred that those phenomenon resulted in higher gap of value relevance between two listed markets[7].

Combining results of Table 3, Table 4 and Table 5, our empirical evidences can be interpreted that IFRS adoption enhanced KOSDAQ-listed firm's value relevance and reduced KSE-listed firm's value relevance in Korea, which may increase comparability of accounting information between the listed markets. It is inferred that this result was attributed to different level of demand for information environment of KOSDAQ and KSE firms.

CONCLUSION

Prior studies which examined effect of IFRS adoption on the value relevance of accounting information provided mixed results. This may, at least in part, come from that prior researches used relatively short-term research periods or didn't consider information environment levels. Thus, this study investigated the effect of IFRS adoption on the value relevance in Korea complementing limitations of prior studies. Specifically, this study analyzed change of the value relevance by comparing the explanatory power of research models estimated for 5 year periods before and after IFRS adoption, respectively. Further, we divided total sample firms into two groups (KSE and KOSDAQ listed firms) and compared the value relevance using both individual and consolidated accounting information. We performed the robustness test utilizing industry-fixed effect model as well.

Empirical results show that the value relevance of accounting information of listed firms in Korea decreased after the introduction of IFRS. However, we found that fall-off of total value relevance is largely

7 It is possible explanation that KSE listed firms are more likely to have subsidiary firms, which implies consolidated accounting numbers better reflect economic values of the whole entity. On the other hand, KOSDAQ listed firms which have relatively low level of accounting information system may have obstacles to report economic values of whole entity by consolidated financial statements.

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attributed to KSE listed firms because the value relevance of KOSDAQ listed firms increased after the introduction of IFRS, while the value relevance of KSE listed firms decreased. Further, we found different effect of IFRS adoption in line with value relevance depending on types of financial statements. Consolidated accounting information of KSE firms showed more value relevance than individual accounting information, but lower value relevance than pre-IFRS period. Gaps of value relevance between two accounting information for KOSDAQ firms were inconsistent and showed lower value relevance than pre-IFRS period. These differentiated effects of IFRS adoption on value relevance may indicate that there is enhancement of comparability of accounting information under IFRS.

This study has contributions that it provides further understanding on the relationship between IFRS adoption and value relevance. Especially, this study expanded prior studies on the value relevance by expanding research periods and comparing changes in the value relevance by listing markets. Also, this study contributes that it specifically analyzed whether the changes of value relevance after IFRS adoption were due to the introduction of IFRS itself or the change of reported financial statements in case of South Korea.

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