



Valuation Role of Accounting Information in Profit and Loss Firms

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Abstract

Purpose of the research: This study identifies the most important value-relevant factor across profit and loss companies listed on the Korean Securities Exchange over the period 2000 to 2015. We aim to improve understanding of the role of accounting information provided by financial statements in firm value across companies.

Materials and methods: We use the residual income valuation model of Ohlson (1995).

Results: The impact of accounting information on enterprise value is significantly different across profit and loss companies. We believe that this phenomenon occurs because of the assumption of linear information dynamics in the residual income model. These findings show that accounting information of profitable companies is likely to reflect on the future firm value; however, accounting information of loss companies tends to provide no such information to financial markets.

Key words: Accounting information; Value relevance; Profit and loss; Korean securities exchange

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INTRODUCTION

Before Ball and Brown (1968) published their seminal study, the biggest concern shared by accounting researchers was whether accounting information can

explain current firm value and predict future potential cash flows. Thereafter, many studies have investigated the influence of accounting information on market value of equity, providing empirical evidence on information content and value relevance of accounting information. Even though they shed light on the value relevance of accounting information, they could not provide detailed relationships between accounting information and firm value because a suitable theoretical model had not been developed.

Ohlson (1995) set up a revised residual income model by adding linear information dynamics derived from the clean surplus relationship from Edward and Bell's (1961) theory. This revised model suggests the role of accounting variables by showing the significant relationship between accounting information and market value of equity. Ohlson's (1995) model provides the theoretical framework for the relationship between the balance sheet and income statements.

Since Ohlson's (1995) publication, many studies have verified the validity of the residual income and his model via empirical tests. Dechow et al. (1999) investigate the validity of Ohlson's (1995) model by testing whether the linear information relationship is correct. Myers (1999) also tests the linear information relationship of the Ohlson (1995) model. Most studies in this regard recognize that, theoretically, it is a very rigid valuation model. Thus, Ohlson's (1995) model, which is based on the residual income equation, provides a new methodology for studying empirical accounting. His valuation model assumes that future abnormal income is linearly associated with current abnormal income. But in this case, the linear information dynamics do not consider growth and divestment in the firm's lifecycle.

Ohlson's (1995) model has high applicability to account practice because it can connect accounting information with enterprise value. Unlike conventional valuation models, his model has a clear theoretical

rationale and provides a framework for firm valuation. Therefore, it can predict market value of equity more accurately than the dividend discount model (Benard 1995; Penman & Sougiannis, 1998).

Feltham and Ohlson (1995) extend the original Ohlson (1995) valuation model by dividing firms' business into operating and financing activities. They assume that every abnormal income is created by operating assets because abnormal earnings from financial assets are zero (0). Feltham and Ohlson (1995) reflect upon the conservative accounting treatment of the valuation model. Benard (1995) compares the explanatory power of input accounting variables on market value of equity in the residual income and dividend discount models using estimates of the value line. The regression results provide evidence that the explanatory power of the residual income model is much higher than that of the dividend discount model. Penman and Sougiannis (1988) compare the real performance of the residual income, dividend discount, and discounted cash flow models, and report that the residual income model shows the highest performance among the three valuation models. Francis et al. (2000) compare the expectation ability with regard to stock price among the residual income, dividend discount, and discounted cash flow models using estimates of the value line. Their empirical results show that the residual income model has the most expectation ability with regard to stock price among the three valuation models.

However, some studies have raised questions about the linear dynamics hypothesis. The book value of equity refers to the accounting estimates of net assets and is the source of a company's future potential cash flows. Therefore, it refers to the basic measurements of mergers, acquisitions, and liquidations of the company. Many studies have reported that book value of equity has more impact on firm value than accounting earnings in companies with losses because such companies have a liquidation option.

Hayn (1995) investigates information contents of accounting earnings in companies with losses. She hypothesizes that the value relevance of losses is weaker than that of profits because losses could not be permanent. The empirical results provide evidence that the value relevance of accounting earnings is lower in companies with losses than companies with profits, while the value relevance of book value of equity does not show significant difference both in profits and losses companies. Hayn (1995) also reports that book value of equity has more value relevance than accounting earnings in small companies because small firms are very sensitive to business fluctuations and have a higher possibility of losses than large firms in depression. Collins et al. (1999) present that the value relevance of accounting information differs by companies from profits and losses. They prove that for firms with continuous losses, book value of equity reflects enterprise value to a greater extent than accounting earnings.

We investigate the role of accounting information using Ohlson's (1995) equation, which is based on the residual income model. We also use Ohlson's (1995) valuation model to derive the empirical relationship between stock price and accounting information such as book value of equity, accounting earnings, operating income, cash flows, and operating cash flows for firms with profits and losses. We examine whether the value relevance of accounting variables changes according to the sign of incomes of firms listed on the Korean securities exchange. Thus, this study converts the conventional Ohlson (1995) valuation model of equity value and earnings into several empirical equations, by inserting other accounting variables that are recognized as other value-relevant factors. We then perform tests for total samples and across subsamples split into profit and loss companies, and observe changes in value relevance over the past 16 years.

We provide three types of implication pertaining to value relevant studies in the Korean stock market. First, the value relevance of accounting information, such as book value of equity, accounting earnings, cash flows, operating income, operating cash flows, differs between profit and loss companies. Second, Korean investors recognize the information impact of accounting variables on equity value in different ways. Third, conventional valuation models, such as those of Ohlson (1995), cannot explain the change in value relevance between market value of equity and accounting variables because of rigid linear information dynamics.

Section 2 outlines the previous literature that examines the value relevance of accounting variables such as book values, accounting earnings, cash flows, operating income, and operating cash flows. Section 3 develops the research hypothesis and explains the models used in the empirical analysis. Section 4 analyzes the empirical models and discusses the empirical results. Section 5 summarizes this paper and concludes.

1. LITERATURE REVIEW

Many studies have investigated the empirical relationship between accounting information and market value of equity (Landsman & Magliolo, 1988; Lev, 1989; Ou & Penman, 1989; Bernard & Thomas, 1990; Barth, 1991; Easton & Harris, 1991; Lev & Thiagarajan, 1993; Penman, 1991; Ou & Penman, 1993; Barth, 1994; Dechow, 1994; Hyan, 1995; Ohlson, 1995; Feltham & Ohlson, 1995; Penman, 1996; Barth & Kallapur, 1996; Collins, Maydew, & Weiss, 1997; Easton, 1999; Lev & Nissim, 2004; Ohlson et al., 2005; Wyatt, 2005). Most report that accounting information such as accounting earnings and book value of equity have significant impact on market value of equity, assuming a linear information relationship between accounting information and the market value of equity.

But some papers have reported adverse results and report problems about linear information dynamics between accounting information and the market value of equity. They insist accounting information has no significant relationship with market value of equity and report that accounting variables such as accounting earnings no longer be considered as value-relevant factors; rather, book value of equity has significant value relevance because of environmental changes experienced by industries over past decades (Lev, 1989; Hayn, 1995; Amir & Lev, 1996; Basu, 1997).

For example, Lev (1989) observes that the usefulness of accounting earnings is limited to investors because accounting earnings have an unstable relationship with stock returns, which are a proxy for enterprise value. Hayn (1995) casts doubt on linear information dynamics and shows a much weaker relationship between market value of equity and accounting earnings for companies with losses, because negative earnings cannot be continuous unlike profits. Amir and Lev (1996) test the value relevance of financial and nonfinancial information and empirically show that book value of equity, accounting earnings, and cash flows have no value relevance in the information technology industry.

Other studies have investigated the increased value relevance of book value of equity (Penman, 1991; Ou & Penman, 1993; Burghstahler & Dichev, 1997; Collins et al., 1997; Barth et al., 1998; Francis & Schipper, 1999; Lev & Zarowin, 1999; Collins et al., 1999; Chen & Zhang, 2002). For example, Ou and Penman (1993) investigate the value relevance of accounting earnings and dividends using Ohlson (1995) valuation model and show that the two main variables are not significantly associated with market value of equity.

Collins et al. (1997) test whether systematic changes in value relevance occur in book value of equity and accounting earnings over the past four decades and find that the value relevance of book value of equity and accounting earnings have not declined over time. They also note that the value relevance of accounting in losses of companies has decreased, while the value relevance of book value has increased. Francis and Schipper (1999) examine the explanatory power of accounting information on market value of equity and show that the explanatory power of accounting earnings on stock prices has declined over time, while that of book values has increased.

Collins et al. (1999) provide evidence that accounting earnings are significantly associated with stock prices in profitable companies, while book value of equity is significantly related to market value of equity in losses firms because of the abandonment option. Using a real options-based equity valuation model, Chen and Zhang (2002) investigate the valuation role of book value of equity and accounting earnings. They show that book value of equity is a substitute for accounting earnings as profitability decreases. These studies suggest that

Ohlson's (1995) valuation model cannot reflect real world businesses because it assumes linear information dynamics. Therefore, many studies report that the value relevance of accounting information declines in the Ohlson (1995) valuation model.

2. HYPOTHESES AND EMPIRICAL MODEL

2.1 Research Hypotheses

We examine whether the impact of accounting information such as book value of equity, accounting earnings, cash flows, operating income, and operating cash flows on enterprise value differs in accordance with profits and losses of companies listed on the Korean Securities Exchange. Thus, we develop the following hypotheses.

H: The value relevance of accounting variables differs significantly between profit and loss companies.

H1: The value relevance of book value of equity differs significantly between profit and loss companies.

H2: The value relevance of accounting earnings differs significantly between profit and loss companies.

H3: The value relevance of operating income differs significantly between profit and loss companies.

H4: The value relevance of cash flows differs significantly between profit and loss companies.

H5: The value relevance of operating cash flows differs significantly between profit and loss companies.

2.2 Empirical Model

This study uses the converted Ohlson (1995) valuation model, which inserts value-relevant variables into equations. The empirical equations for the study's hypotheses are as follows:

$$MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 NI_{i,t}/S_{i,t} + \varepsilon_{i,t}, \quad (1)$$

$$MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 CF_{i,t}/S_{i,t} + \varepsilon_{i,t}, \quad (2)$$

$$MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OI_{i,t}/S_{i,t} + \varepsilon_{i,t}, \quad (3)$$

$$MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OCF_{i,t}/S_{i,t} + \varepsilon_{i,t}. \quad (4)$$

$MV_{i,t}$ is the main dependent variable, which represents the total market value of equity 3 months later in year t . Independent variable $BV_{i,t-1}$ is estimated as the total equity value at the end of year $t-1$. $NI_{i,t}$ refers to net income in period t , $OI_{i,t}$ is operating income in period t , $CF_{i,t}$ denotes total cash flows in period t , and $OCF_{i,t}$ refers to operating income in period t . a_1 , a_2 represent the coefficients in every equation, and $\varepsilon_{i,t}$ is the error term. All the research variables are standardized by total sales in period t .

3. EMPIRICAL ANALYSIS

3.1 Sample Selection

Our sample covers all firms listed on the Korean Stock Market over the period 2000 to 2015. We sourced the

accounting information from the Korea Investor Service-Financial Analysis System Data Base (KIS-VALUE DB). We used sample data with no missing estimates in each period and excluded outliers by deleting companies having

an absolute value of student residuals or Cook's distance exceeding 2 or 0.5, respectively. We also excluded banking and legal management firms having negative book value. Table 1 displays the sample selection procedure used here.

Table 1
Sample Data Selection

Extracted sample data from the KIS-VALUE DB from 2000 to 2015 (firm-year)	35,040
Minus (-):	15,919
Companies that do not settle their accounts in december annually	
Banking and financial companies	
Companies of administrative issues	
Impaired capital companies	
Companies that do not have data on research variables in the KIS-VALUE DB	
Total data samples (firm-year)	19,121

3.2 Empirical Analysis

3.2.1 Descriptive Statistics

Table 2 displays the descriptive statistics of market value

of equity, book value of equity, accounting earnings, cash flows, operating cash flows, and operating income in accordance with profits and losses sample data.

Table 2
Descriptive Statistics of the Main Variables

Division	Number of samples	Variable	Median	Standard deviation	Minimum	Maximum
Total sample	19,121	$MV_{i,t}/S_{i,t}$	2.202	16.174	0.002	1,367.000
		$BV_{i,t-1}/S_{i,t}$	1.700	28.518	0.001	3,755.000
		$NI_{i,t}/S_{i,t}$	0.023	2.473	-102.269	184.934
		$CF_{i,t}/S_{i,t}$	0.010	0.831	-42.844	60.392
		$OI_{i,t}/S_{i,t}$	0.030	0.521	-48.042	1.000
		$OCF_{i,t}/S_{i,t}$	0.058	1.182	-73.647	68.834
Profits companies	14,675	$MV_{i,t}/S_{i,t}$	1.866	9.933	0.011	657.294
		$BV_{i,t-1}/S_{i,t}$	1.409	8.096	0.002	468.625
		$NI_{i,t}/S_{i,t}$	0.157	2.558	0.000	184.934
		$CF_{i,t}/S_{i,t}$	0.006	0.648	-42.844	22.963
		$OI_{i,t}/S_{i,t}$	0.089	0.145	-8.812	1.000
		$OCF_{i,t}/S_{i,t}$	0.104	0.907	-13.927	68.058
Loss companies	4,446	$MV_{i,t}/S_{i,t}$	3.309	28.245	0.002	1,366.650
		$BV_{i,t-1}/S_{i,t}$	2.662	57.273	0.001	3,754.990
		$NI_{i,t}/S_{i,t}$	-0.420	2.105	-102.269	0.000
		$CF_{i,t}/S_{i,t}$	0.023	1.259	-15.111	60.392
		$OI_{i,t}/S_{i,t}$	-0.165	1.024	-48.042	0.943
		$OCF_{i,t}/S_{i,t}$	-0.093	1.807	-73.647	68.834

Note. $MV_{i,t}$ =market value of equity 3 months later in year t , $BV_{i,t-1}$ =total equity value at the end of year $t-1$, $NI_{i,t}$ =net income in period t , $OI_{i,t}$ =operating income in period t , $CF_{i,t}$ =total cash flows in period t , $OCF_{i,t}$ =operating income in period t , $S_{i,t}$ =total sales in period t .

3.2.2 Correlation Analysis

We perform a pearson analysis on the main variables, to estimate the correlation degree and directions (Table 3). Table 3 presents that book value of equity, cash flows,

and operating cash flows are positively correlated to stock prices. Accounting earnings and operating income have negative correlations with the independent variable.

Table 3
Pearson Correlation

Variables	$MV_{i,t}/S_{i,t}$	$BV_{i,t-1}/S_{i,t}$	$NI_{i,t}/S_{i,t}$	$CASH_{i,t}/S_{i,t}$	$OI_{i,t}/S_{i,t}$	$OCF_{i,t}/S_{i,t}$
$MV_{i,t}/S_{i,t}$	1.000					
$BV_{i,t-1}/S_{i,t}$	0.222 <0.0001	1.000				
$NI_{i,t}/S_{i,t}$	-0.002 0.796	0.079 <0.0001	1.000			
$CF_{i,t}/S_{i,t}$	0.389 <0.0001	0.064 <0.0001	-0.495 <0.0001	1.000		
$OI_{i,t}/S_{i,t}$	-0.544 <0.0001	-0.021 0.004	0.224 <0.0001	-0.161 <0.0001	1.000	
$OCF_{i,t}/S_{i,t}$	0.232 <0.0001	0.131 <0.0001	0.380 <0.0001	0.019 0.010	0.358 <0.0001	1.000

Note. $MV_{i,t}$ =market value of equity 3 months later in year t , $BV_{i,t-1}$ =total equity value at the end of year $t-1$, $NI_{i,t}$ =net income in period t , $OI_{i,t}$ =operating income in period t , $CF_{i,t}$ =total cash flows in period t , $OCF_{i,t}$ =operating cash flows in period t , $S_{i,t}$ =total sales in period t . Pearson's coefficients of correlation were estimated using the two-sided test.

3.2.3 Value Relevance Tests for Total Sample Companies

Table 4 presents the empirical relationship between the dependent variable (market value of equity) and independent variables (book value of equity, accounting earnings, cash flows, operating income, and operating cash flows) for all the sample companies. Table 4 displays

that book value of equity (BV/S) has a significantly positive impact on market value of equity (MV/S) in every research model. Moreover, Table 4 shows that accounting earnings (NI/S) and cash flows (CF/S) are positively related to market value (MV/S), while operating income (OI/S) and operating cash flows (OCF/S) are negatively associated with market value (MV/S).

Table 4
Comparative Value Relevance of Accounting Information (Total Sample)

Variables and expected sign		Total sample (19,121 firms–year: 2000–2015)			
Variables	Expected sign	Model 1	Model 2	Model 3	Model 4
Intercept	?	1.499***	1.315***	1.723***	1.348***
$BV_{i,t-1}/S_{i,t}$	+	0.504***	0.550***	0.453***	0.575***
$NI_{i,t}/S_{i,t}$	+	0.314***			
$CF_{i,t}/S_{i,t}$	+		2.626***		
$OI_{i,t}/S_{i,t}$	+			-5.924***	
$OCF_{i,t}/S_{i,t}$	+				-0.197***
ΣYD	Included	Included	Included	Included	
ΣIND	Included	Included	Included	Included	
F-Value	931.87***	1374.74***	961.57***	1494.21***	
Adj. R-square	0.370	0.464	0.377	0.484	
Number of samples used	19,051	19,034	19,016	19,044	

- a) Variable definitions: Refer to Table 2
- b) Model 1: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 NI_{i,t}/S_{i,t} + \varepsilon_{i,t}$,
- c) Model 2: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 CF_{i,t}/S_{i,t} + \varepsilon_{i,t}$,
- d) Model 3: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OI_{i,t}/S_{i,t} + \varepsilon_{i,t}$,
- e) Model 4: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OCF_{i,t}/S_{i,t} + \varepsilon_{i,t}$,
- f) The number of samples used in this analysis was arrived at after excluding samples that have Cook's distance greater than 0.5 and the absolute value of studentized residuals greater than 1,
- g) *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

3.2.4 Value Relevance Tests for Profits and Losses Sample Companies

We divide total sample data into two subgroups of profits and losses companies. Table 5 presents the empirical

relationship between the dependent variable and independent variables for profits and losses companies. The findings of the empirical analysis show that book value of equity (BV/S), cash flows (CF/S), operating

cash flows (OCF/S), and operating income (OI/S) have significantly positive relationship with market value of equity (MV/S) in the profit companies group, while accounting earnings (NI/S) shows a negative relationship with the independent variables in Table 5. In losses

companies, the accounting earnings (NI/S), operating cash OCF/S, and OI/S show a negative association with the market value of equity, while BV/S and CF/S provide a positive relationship with the dependent variable (MV/S).

Table 5
Changes in the Comparative Value Relevance of Accounting Information(Profit vs. Loss Companies)

Variables and expected sign		Total sample (19,121 firm–year: 2008-2013)							
		Profitscompanies (14,675 firm–year)				Losses companies (4,446 firm–year)			
Variables	Expected sign	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Intercept	?	0.664***	0.623***	0.431***	0.695***	0.931***	1.451***	0.895***	5.601***
$BV_{i,t-1}/S_{i,t}$	+	0.993***	0.967***	0.919***	0.694***	0.574***	0.786***	0.300***	0.069***
$NI_{i,t}/S_{i,t}$	+	-0.494***				-2.403***			
$CF_{i,t}/S_{i,t}$	+		1.565***				3.407***		
$OI_{i,t}/S_{i,t}$	+			2.478***				-10.267***	
$OCF_{i,t}/S_{i,t}$	+				2.517***				-0.539**
ΣYD	Included	Included	Included	Included	Included	Included	Included	Included	
ΣIND	Included	Included	Included	Included	Included	Included	Included	Included	
F-Value	5,928.15***	5,789.22***	5,341.29***	4,151.22***	451.09***	377.33***	546.03***	17.20***	
Adj. R-square	0.740	0.736	0.720	0.666	0.416	0.374	0.463	0.0249	
Number of samples used	14,558	14,557	14,561	14,547	4,428	4,408	4,423	4,446	
Chow test		Break point				F-value			
		14,675				1,086.13***			

a) Variable definitions: refer to Table 2,

b) Model 1: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 NI_{i,t}/S_{i,t} + \varepsilon_{i,t}$,

c) Model 2: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 CF_{i,t}/S_{i,t} + \varepsilon_{i,t}$,

d) Model 3: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OI_{i,t}/S_{i,t} + \varepsilon_{i,t}$,

e) Model 4: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OCF_{i,t}/S_{i,t} + \varepsilon_{i,t}$,

f) The number of samples used in this analysis was arrived at after excluding samples that have Cook's Distance greater than 0.5 and absolute value of studentized residuals greater than 1,

g) *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

The results suggest that BV/S and CF/S have positive impacts on MV/S, while NI/S are always negatively related to stock prices (MV/S) regardless of the sign of accounting earnings. This result is consistent with the findings of previous researchers such as Hyan (1995), Burghstahler and Dichev (1997), Collins et al. (1997), and Barth et al. (1998), who observe that accounting earnings are negatively associated with market value of equity. This result also suggests new evidence that cash flows are a constant value-relevant factor, like book value of equity, irrespective of the amounts of accounting earnings.

3.2.5 Value Relevance Tests for the KOSPI and KOSDAQ Sample Groups

We divide the total sample companies into two

subgroups, KOSDAQ and KOSPI, to investigate whether the value relevance difference between accounting information exists in accordance with which financial market the firm belongs to. The results of the empirical analysis show that book value of equity (BV/S), cash flows (CF/S), operating cash flows (OCF/S), and operating income (OI/S) have significantly positive relationships with enterprise value (MV/S) in the KOSPI group, while only accounting earnings (NI/S) present a negative relationship with MVS (Table 6). We obtain the same result with the profits groups. In the KOSDAQ group, NI/S, CF/S, OCF/S, and OI/S have negative associations with the independent variable (MVS), whereas BV/S still shows a positive relationship with market value of equity.

Table 6
Changes in Comparative Value Relevance of Accounting Information (KOSPI vs. KOSDAQ)

Variables and expected sign		KOSPI (8,635 firm–year: 2000-2015)				KOSDAQ (10,486 firm–year: 2000-2015)			
Variables	Expected sign	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Intercept	?	0.348***	0.127***	0.293***	0.142***	1.619***	1.165***	1.545***	1.740***
$BV_{i,t-1}/S_{i,t}$	+	0.930***	1.030***	0.904***	0.807***	0.652***	0.946***	0.757***	0.707***
$NI_{i,t}/S_{i,t}$	+	-0.406***				-1.226***			
$CF_{i,t}/S_{i,t}$	+	2.988***				-0.834***			
$OI_{i,t}/S_{i,t}$	+	1.216***				-5.962***			
$OCF_{i,t}/S_{i,t}$	+	3.911***				-0.892***			
ΣYD	Included	Included	Included	Included	Included	Included	Included	Included	Included
ΣIND	Included	Included	Included	Included	Included	Included	Included	Included	Included
F-Value	1,609.62***	7,482.91***	1,625.86***	12,593.8***	547.33***	616.85***	569.70***	514.63***	
Adj. R-square	0.693	0.913	0.695	0.946	0.386	0.415	0.396	0.372	
Number of samples used	8,563	8,561	8,566	8,562	10,443	10,408	10,408	10,422	
Chow test		Break point 8,635				F-value 279.58***			

- 1) Variable definitions: Refer to Table 2,
- 2) Model 1: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 NI_{i,t}/S_{i,t} + \varepsilon_{i,t}$,
- 3) Model 2: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 CF_{i,t}/S_{i,t} + \varepsilon_{i,t}$,
- 4) Model 3: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OI_{i,t}/S_{i,t} + \varepsilon_{i,t}$,
- 5) Model 4: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OCF_{i,t}/S_{i,t} + \varepsilon_{i,t}$,

6) The number of samples used in this analysis was arrived at is after excluding samples that have Cook’s Distance greater than 0.5 and absolute value of studentized residuals greater than 1,

- 7) *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

BV/S has a constantly positive impact on MVS irrespective of the type of financial market the firm belongs to, while NI/S are negatively associated with stock prices (MV/S) regardless of the sample groups. This empirical result is similar to that of Hyan (1995), who shows that accounting earnings have little influence on market value of equity for small-and medium-sized companies, and book value of equity substitutes for accounting earnings in firm value.

3.2.6 Value Relevance Tests for Profits and Losses in the KOSPI Sample Group

This study divides KOSPI sample data into two

subgroups by profits and losses companies. Table 7 presents the empirical association between market value of equity and book value of equity, accounting earnings, cash flows, operating income, and operating cash flows for profits and losses groups in KOSPI companies. Book value of equity (BV/S), cash flows (CF/S), operating cash flows (OCF/S), and operating income (OI/S) are positively associated with enterprise value (MV/S) of significant level of 1% in profit companies groups, while accounting earnings (NI/S) are negatively related to market value of equity in Table 7. This is similar to the results for KOSPI in Table 6.

Table 7
Change in Comparative Value Relevance of Accounting Information: Profits vs. Losses Companies (KOSPI Sample Group)

Variables and expected sign		Profits companies (6,936 firm–year)				Losses companies (1,699 firm–year)			
Variables	Expected sign	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Intercept	?	0.333***	0.390***	0.254***	0.475***	0.478***	0.524***	0.355***	0.263***
$BV_{i,t-1}/S_{i,t}$	+	1.002***	0.911***	0.863***	0.620***	0.636***	0.622***	0.598***	0.765***
$NI_{i,t}/S_{i,t}$	+	-0.539***				-0.203***			
$CF_{i,t}/S_{i,t}$	+	1.352***				-0.661***			
$OI_{i,t}/S_{i,t}$	+	1.841***				-2.797***			
$OCF_{i,t}/S_{i,t}$	+	2.729***				-1.565***			
ΣYD	Included	Included	Included	Included	Included	Included	Included	Included	Included
ΣIND	Included	Included	Included	Included	Included	Included	Included	Included	Included
F-Value	3,344.09***	2,806.18***	2,767.02***	2,951.64***	130.59***	272.04***	169.44***	194.40***	
Adj. R-square	0.773	0.741	0.738	0.750	0.351	0.529	0.411	0.447	

To be continued

Continued

Variables and expected sign		Profits companies (6,936 firm-year)				Losses companies (1,699 firm-year)			
Variables	Expected sign	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Number of samples used	6,866	6,871	6,870	6,874	1,678	1,688	1,688	1,673	
Chow test		Break point 6,936				F-value 171.85***			

- a) Variable definitions: Refer to Table 2.
- b) Model 1: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 NI_{i,t}/S_{i,t} + \epsilon_{i,t}$,
- c) Model 2: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 CF_{i,t}/S_{i,t} + \epsilon_{i,t}$,
- d) Model 3: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OI_{i,t}/S_{i,t} + \epsilon_{i,t}$,
- e) Model 4: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OCF_{i,t}/S_{i,t} + \epsilon_{i,t}$,
- f) The number of samples used in this analysis was arrived at after excluding samples that have Cook's Distance greater than 0.5 and absolute value of studentized residuals greater than 1.
- g) *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

In the losses group, NI/S, OCF/S, and OI/S have negative associations with MV/S, while BV/S shows a constantly positive relationship with the dependent variable (MV/S). This result of the losses companies in the KOSPI group is similar to that of the corresponding companies in the KOSDAQ group (Table 6).

It appears that BV/S is a constant factor in MVS irrespective of the type of group (profits or losses), while NI/S lose value relevance regardless of the sign of accounting earnings in the KOSPI sample. This result is similar to those of previous studies (Hyan, 1995; Burghstahler & Dichev, 1997; Collins et al., 1997; Barth et al., 1998), indicating value relevance loss of

accounting earnings. It also suggests the importance of emerging value of relevance factors such as CF/S, OCF/S, and OI/S.

3.2.7 Value Relevance Tests for Profits and Losses in the KOSDAQ Sample Group

We divide the KOSDAQ sample data into two subgroups by profits and losses firms. Table 8 displays the empirical relationship between the market value of equity and accounting information for profits and losses subgroups within the KOSDAQ firms. Every independent variable is positively related to market value of equity (MVS) of significant level of 1% for profit companies in the KOSDAQ sample.

Table 8
Change in Comparative Value Relevance of Accounting Information: Profits vs. Losses Companies (KOSDAQ Sample Group)

Variables and expected sign		Profits companies (7,739 firm-year)				Losses companies (2,747 firm-year)			
Variables	Expected sign	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Intercept	?	0.888***	0.868***	0.386***	0.811***	1.035***	1.372***	0.299***	0.697***
$BV_{i,t-1}/S_{i,t}$	+	0.900***	1.003***	1.020***	0.922***	0.021***	1.113***	0.744***	1.001***
$NI_{i,t}/S_{i,t}$	+	1.251***				-6.190***			
$CF_{i,t}/S_{i,t}$	+		2.722***				6.132***		
$OI_{i,t}/S_{i,t}$	+			5.466***				-10.414***	
$OCF_{i,t}/S_{i,t}$	+				1.883***				-9.925***
ΣYD	Included	Included	Included	Included	Included	Included	Included	Included	
ΣIND	Included	Included	Included	Included	Included	Included	Included	Included	
F-value		1,259.57***	2,923.84***	3,214.04***	1,261.57***	235.79***	274.71***	521.69***	431.91***
Adj. R-square		0.532	0.727	0.745	0.535	0.377	0.414	0.573	0.525
Number of samples used		7,683	7,685	7,688	7,677	2,717	2,717	2,722	2,728
Chow test		Break point 7,739				F-value 548.16***			

- a) Variable definitions: Refer to Table 2
- b) Model 1: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 NI_{i,t}/S_{i,t} + \epsilon_{i,t}$,
- c) Model 2: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 CF_{i,t}/S_{i,t} + \epsilon_{i,t}$,
- d) Model 3: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OI_{i,t}/S_{i,t} + \epsilon_{i,t}$,
- e) Model 4: $MV_{i,t}/S_{i,t} = a_0 + a_1 BV_{i,t-1}/S_{i,t} + a_2 OCF_{i,t}/S_{i,t} + \epsilon_{i,t}$,
- f) The number of samples used in this analysis was arrived at after excluding samples that have Cook's Distance greater than 0.5 and absolute value of studentized residuals greater than 1.
- g) *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

In the losses group, book value (BV/S) and cash flows (CF/S) show positive relationships with enterprise value (MV/S), while accounting earnings (NI/S), operating cash flows (OCF/S), and operating income (OI/S) have negative associations with the independent variable (MV/S). This is similar to the results of the losses group in Table 5.

The results indicate that BV/S and CF/S are constant value-relevant factors regardless of whether the firms are profits and losses entities, while the value relevance of other variables such as accounting earnings, operating income, operating cash flows is changed by the sign of accounting earnings in the KOSDAQ sample group.

CONCLUSION

We use Ohlson's (1995) valuation model to examine whether the value relevance of accounting information such as book value of equity, accounting earnings, cash flows, operating income, operating cash flows changes according to the sign of incomes for firms listed at the Korean Securities Exchange. We convert a conventional Ohlson (1995) valuation model of equity value and earnings into several empirical equations by inserting the main variables of this study. We also perform tests for total samples and across subsamples split into profit and loss companies, and observe changes in value relevance over the past 16 years.

Book value of equity (BV/S) has a significantly positive impact on market value of equity (MV/S) in every research model, and accounting earnings (NI/S) and cash flows (CF/S) are positively related to market value of equity (MV/S). Operating income (OI/S) and operating cash flows (OCF/S) are negatively associated with market value (MV/S) in the total sample of the Korean stock market.

BV/S and CF/S have positive impacts on MV/S, while NI/S are always negatively related to stock prices (MV/S) regardless of the sign of accounting earnings (profits vs. losses).

BV/S has a constantly positive impact on MV/S, while NI/S are negatively associated with MV/S irrespective of the type of financial market.

BV/S is a constant factor in valuing an enterprise (MV/S) irrespective of which group the firm belongs to (profits or losses), while NI/S loses value relevance regardless of the sign of accounting earnings in the KOSPI sample. This result is similar to those of previous studies, indicating value relevance loss of accounting earnings. This result also highlights emerging value of relevant factors such as CF/S, OCF/S, and OI/S in the KOSPI sample group.

BV/S and CF/S are constant value-relevant factors regardless of whether the firm makes profits or losses, while the value relevance of other variables such as accounting earnings, operating income, operating cash

flows is changed by the sign of accounting earnings in the KOSDAQ sample group. These empirical results are similar to those of the previous literature, such as Hyan (1995), Burghstahler and Dichev (1997), Collins et al. (1997), and Barth et al. (1998), which show that accounting earnings are negatively associated with market value of equity. These results also provide new evidence, in that cash flow is a constant value-relevant factor, like book value of equity, irrespective of the amount of accounting earnings.

The results of this study should be interpreted cautiously because various factors affect market value of companies. This paper covers only book value of equity, accounting earnings, operating income, cash flows, and operating cash flows, which are already recognized as value-relevant factors. Therefore, more research is needed to identify additional value-relevant factors.

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