

Value Relevance of Accounting Information: An Empirical Study of Selected Indian Firms

Manisha Khanna

Research Scholar, Department of Business Management and Commerce, University Business School, Panjab University, Chandigarh, and Assistant Professor, Department of Commerce at Govt. PG College, Kalka

Abstract- The present study analyses the combined, individual, and incremental value relevance of accounting information produced by firms listed on the S&P BSE-500 for FY-2006 to FY-2010, and changes therein over a period of time. Results provide sufficient evidence that accounting information is value relevant for BSE-listed firms. The combined value relevance of accounting information represented by earnings per share and book value per share has declined while there have been insignificant changes in the incremental value relevance of accounting information.

Index Terms- Value relevance, earnings per share, book value of equity per share.

relevance of book values (Berger *et al.*, 1996; Burgstahler and Dichev, 1997; Collins *et al.*, 1997).

Research on value relevance of accounting information has lately drawn attention of both practitioners and academicians, specifically, during the global financial crisis of 2007-2009 reported by North America and European banks. Further, the recent scandals in India, such as the fraud at Satyam, have also highlighted the value relevance of accounting information for the Indian capital market (Krishnan and Krishnan, 2013). However, in India, the researchers have mainly focused on value relevance of financial statements with main focus on cash flow reporting (Vishnani and Shah, 2008; Srinivasan and Narsimhan, 2010).

I. INTRODUCTION

Value relevance research is motivated by the fact that listed firms use financial statements as one of the major medium of communication with their shareholders and public at large. Market usually depends on financial reports prepared by the management of such firms. For making the financial reporting to be effective, information contained in the financial reports should be relevant and reliable (Barth *et al.*, 2001). Information is considered to be relevant when it influences the users' decisions to form predictions or help in confirming or correcting the past evaluations, while, it is considered reliable if can be depended upon to faithfully represent the transactions or events that it aims to represent without any undue error or bias (FASB, 1976). According to Barth *et al.* (2001) a value relevant information should have both the features of relevance and reliability.

The value of a firm is based on what the market perceives about its performance, and accounting disclosures provide the essential information so as to form the basis of such perception. Many studies have examined the value relevance of earnings per share (EPS), book value of equity per share (BVPS), and cash flows. Such studies have reported that earnings and book values have significant information content for equity valuation of a firm (e.g., Dechow, 1994; Cheng *et al.*, 1996; Pfeiffer *et al.*, 1998; Holthousen and Watts, 2001; Choi *et al.*, 2006; Kwon, 2009). Earnings and book values are considered more value relevant for firm's valuation than cash flows, as cash flows usually have severe matching and timing problems (Ohlson, 1995; Barth *et al.*, 1998; Collins *et al.*, 1999). Studies have also suggested that the value relevance of earnings and book values move inversely to one another, and that decline in value relevance of earnings is accompanied by increase in value

II. LITERATURE REVIEW

This part of literature review has focused on studies that have examined the value relevance of accounting information. An accounting figure is value relevant if it has a significant strong predicted association with the stock prices or stock market indicators such as price-to-earnings or price-to-book ratios (Amir *et al.*, 1993). A large part of literature has identified earnings per share (EPS) and book value per share (BVPS) as the two most important accounting measures that have a significant positive association with market value of a firm, proxy by share prices (e.g., El-Gazzar *et al.*, 2006; Clarkson *et al.*, 2009; Oyerinde, 2009; Alfaraih and Alanezi, 2011; Khanagha *et al.*, 2011). Hunt *et al.* (1997) reported that the incremental explanatory power of BVPS has been found to be higher than that of EPS. The explanatory power of earnings and book value for stock prices in China had increased over time through 1992 to 1996 (Bao and Chow, 1999). Using a return and price model, Chen *et al.* (2001) examined the relationship between accounting information represented by EPS and BVPS, and stock price in the Chinese stock market during 1991-1998. Their findings showed that accounting information was value relevant according to both pooled cross-section and time-series regression.

Safajou *et al.* (2005) examined the empirical relationship of EPS and BVPS with stock market value, using the Ohlson (1995) model for the period 1997-2003. The results showed that there was a significant relationship between EPS, BVPS and price. Ragab and Omran (2006) investigated the value relevance of earnings and book values in the Egyptian market from 1998-2002 and explored that, based on both returns and price models, EPS and BVPS were all relevant and explained about 40 percent of the variation in stock prices. Qystein and Frode (2007) evaluated the value relevance of financial reporting over a period of 40 years highlighting that the value relevance of Norwegian

GAAP was non-declining throughout 1965-2004. Chandra and Ro (2008) found that the combined value relevance of earnings and revenues had stayed constant and that the value relevance of earnings had declined while the impact of revenues on price had not decreased. Pourheydari *et al.* (2008) compared the value relevance of book value and dividends versus book value and reported earnings in the Tehran Stock Exchange from 1996-2004. The results indicated that there was a positive relationship of dividends, book value, and earnings with stock market value. Dung (2010) tested the value relevance of financial statement information on the Vietnamese stock market. Results showed that the value relevance of accounting information was statistically meaningful, though somewhat weaker than in other developed and emerging markets. Filip (2010) investigated the impact of the mandatory IFRS adoption in Romania to show an increase in the value relevance of earnings post IFRS implementation.

Some studies have examined the value relevance of earnings and book values for voluntary early adopters of the International Accounting Standards (IASs). Bartov *et al.* (2005) examined the effect of adoption of IASs for their sample of 37 German companies using a linear pricing model. They employed a pre-post design and found an increase in the value relevance of earnings on switching from the German GAAP to IASs. Hung and Subramanyam (2007) explored the value relevance of restatement differences for 80 voluntary (early) IASs adopters in Germany. They found that the combined value relevance of EPS and BVPS decreased after switch to the IASs. Barth *et al.* (2008), used a pre-post design for a sample of 319 firms that voluntarily adopted IASs between 1994-2003, found that the R^2 for the price level model increased from 28 percent to 40 percent in the adoption year relative to the pre-adoption year for the IASs adopters.

III. OBJECTIVES OF THE STUDY

- To determine the value relevance of accounting information represented by earnings and book values,
- To examine the changes in the value relevance of accounting information over a period of time.

IV. RESEARCH METHODOLOGY

The S&P BSE-500 Index constitutes the population for the present analysis. The study has been carried out for the financial years April 01, 2006 to March 31, 2011. Companies in the banking, insurance, finance industry, and central public sector enterprises (CPSEs) were eliminated due to their unique industry regulations. Finally, companies with missing data over the study period and financial year ending other than the fiscal year (April 01 - March 31) of a particular year were excluded from the analysis. These sample selection criteria resulted in a final sample of 241 firms with 1,205 firm-year observations over the five year study period for assessing the value relevance of accounting information.

The data required for the study relates to the stock price and financial reporting information, which has been obtained from the corporate database (PROWESS) maintained by the Center for

Monitoring the Indian Economy (CMIE), annual reports of the companies, and the website of the BSE (<http://www.bseindia.com>), and Moneycontrol (<http://www.moneycontrol.com>). In order to examine the value relevance of accounting information, the measurement approach of value relevance has been used. According to this approach, value relevance of financial statements is measured by their ability to capture or summarize the information that has affected stock price summaries which makes them relevant in equity valuation. The Ohlson (1995) Price Valuation Model has been used in the present study to determine the value relevance of accounting information. This model expresses market price per share (MP) as a function of both earnings per share (EPS) and book value per share ($BVPS$). The following Value Relevance Models have been used to assess the value relevance of accounting information:

Model 1: $MP_{jt} = \alpha_0 + \alpha_1 EPS_{jt} + \alpha_2 BVPS_{jt} + e_{jt}$

Model 2: $MP_{jt} = \beta_0 + \beta_1 EPS_{jt} + e_{jt}$

Model 3: $MP_{jt} = \gamma_0 + \gamma_1 BVPS_{jt} + e_{jt}$

where

MP_{jt} = Market price per share of firm j in year t three months after the balance sheet date

EPS_{jt} = Earnings per share based on PAT for firm j in year t

$BVPS_{jt}$ = Book value of equity per share for firm j in year t

e_{jt} = Error term for firm j in year t

V. RESEARCH HYPOTHESES

Based on literature review, following research hypotheses have been formulated regarding value relevance of accounting information:

H1a: *There is a positive relationship between market value of a firm represented by share prices and accounting information represented by EPS and BVPS.*

H1b: *The incremental and combined value relevance of accounting information changes over a period of time.*

VI. ANALYSIS AND RESULTS

6.1 Descriptive Statistics

Descriptive statistics were generated for the sample used to test value relevance hypotheses. Table 1 provides descriptive statistics based on the panel cross-sectional times series using the full sample of 1,205 firm-year observations for the dependent and independent variables. The table shows the mean, median, standard deviation, minimum, and maximum for the variables of interest.

Table 1: Descriptive Statistics (n = 1,205)

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
MP	41.051	21.067	57.402	0.706	583.058
EPS	2.567	1.468	4.030	-5.416	76.806
BVPS	13.305	9.025	13.028	0.106	93.121

Note: *MP* is the market price per share of firm *j* in year *t* three months after the balance sheet date. *EPS* is the earnings per share based on PAT for firm *j* in year *t*. *BVPS* is the book value of equity per share for company *j* in year *t*.

Table 1 shows that *MP* varied significantly, ranging from ₹ 0.706 crore to ₹ 583.058 crore with a mean (median) of ₹ 41.051 crore (₹ 21.067 crore). The table indicates that the mean (median) *EPS* during the study period is ₹ 2.567 (₹ 1.468 crore), ranging from a loss of ₹ 5.416 crore to ₹ 76.806 crore. The mean (median) *BVPS* is ₹ 13.305 crore (₹ 9.025 crore), ranging from ₹

0.106 crore to ₹ 93.121 crore. Mean *BVPS* is about five times higher than that of *EPS*. The mean values of *MP*, *EPS*, *BVPS*, tended to be higher than their respective median, indicating that the distribution was positively skewed.

6.2 Correlation Analysis

The correlation is examined to measure the association between the variables. Table 2 shows the Spearman correlation coefficients (above the diagonal) and the Pearson correlation coefficients (below the diagonal) for the panel data.

Table 2: Correlation Matrix (n = 1,205)

Variable	<i>MP</i>	<i>EPS</i>	<i>BVPS</i>
<i>MP</i>	1.000	0.800**	0.612**
<i>EPS</i>	0.652**	1.000	0.765**
<i>BVPS</i>	0.602**	0.689**	1.000

Note: ** Correlation is significant at the 0.01 level (two-tailed). * Correlation is significant at the 0.05 level (two-tailed). *MP* is the market price per share of firm *j* in year *t* three months after the balance sheet date. *EPS* is the earnings per share based on PAT for firm *j* in year *t*. *BVPS* is the book value of equity per share for firm *j* in year *t*.

The correlation matrix shows, in line with expectations, a strong positive correlation between *EPS* and *MP* (0.800). The association between *BVPS* and *MP* is also strong and positive (0.612) but less in magnitude than that of *EPS* with *MP*. Similar results are obtained for the Pearson correlation. *EPS* and *BVPS* are also significantly positively correlated with each other.

6.3 Multivariate Analysis

6.3.1 Value Relevance of Accounting Information

The objectives of the study are to determine the value relevance of accounting information represented by *EPS* and *BVPS*, and changes therein over a period of time. Panel and yearly cross-sectional regressions of value relevance models are determined for this purpose. Yearly cross-sectional regressions help in examining the changes in the combined and incremental value relevance of *EPS* and *BVPS*. Adjusted R^2 is used as the primary indicator of the value relevance of accounting

information. Further, the significant regression coefficients of the independent variables are used as an indicator of value relevance of individual independent variables.

Consistent with past research, Adjusted R^2_T obtained from Model 1 yields the result of combined value relevance of accounting information while the Models 2 and 3 have been inserted so as to determine the individual value relevance of *EPS* and *BVPS*, as measured by their respective Adjusted R^2 s (Collins *et al.*, 1997). The Adjusted R^2_T (combined value relevance of accounting information) has been decomposed into two parts, viz., incremental explanatory power provided by *EPS* represented by Adjusted R^2_{EPS} , and incremental explanatory power provided by *BVPS* represented by Adjusted R^2_{BVPS} . Table 3 presents the results of Generalised Least Square Random Effect Model for the panel and yearly cross-section regressions of *MP* on *EPS* and *BVPS* jointly, individually, and incremental value relevance of *EPS* and *BVPS*.

Table 3: Panel and Yearly Cross-sectional Regressions of *MP* on *EPS* and *BVPS*

Model 1: $MP_{it} = \alpha_0 + \alpha_1 EPS_{it} + \alpha_2 BVPS_{it} + e_{it}$ Model 2: $MP_{it} = \beta_0 + \beta_1 EPS_{it} + e_{it}$ Model 3: $MP_{it} = \gamma_0 + \gamma_1 BVPS_{it} + e_{it}$											
Year	N	α_1	α_2	Adj. R^2_T (A)	F Statistics (p-value)	β_1	Adj. R^2_2 (B)	γ_1	Adj. R^2_3 (C)	Adj. R^2_{EPS} (A) - (C)	Adj. R^2_{BVPS} (A) - (B)
2006-2007	241	13.615*** (4.83)	1.126* (1.92)	0.611	56.06 (0.000)	16.384*** (8.57)	0.603	4.606*** (9.59)	0.458	0.153	0.008
2007-2008	241	5.240*** (4.82)	1.392*** (3.53)	0.593	60.13 (0.000)	8.466*** (9.30)	0.556	2.932*** (10.95)	0.526	0.067	0.037
2008-2009	241	12.409*** (7.35)	0.634** (2.47)	0.614	61.27 (0.000)	14.022*** (9.78)	0.604	2.652*** (9.65)	0.336	0.278	0.010
2009-2010	241	10.206***	0.540*	0.532	37.91	12.256***	0.526	2.368***	0.416	0.116	0.006

		(4.48)	(1.28)		(0.000)	(8.56)		(9.21)			
2010-2011	241	2.287 ^{***} (1.43)	1.520 ^{***} (4.65)	0.383	29.31 (0.000)	4.621 ^{**} (2.09)	0.248	1.997 ^{***} (7.91)	0.341	0.042	0.135
Panel	1,205	5.855 ^{**} (2.31)	1.124 ^{**} (2.60)	0.470		7.768 ^{***} (3.26)	0.426	2.426 ^{***} (10.03)	0.362	0.108	0.044
Wald χ^2				123.09 (0.000)			10.65 (0.000)		100.60 (0.000)		

Note: *, **, *** Significant at 10%, 5%, and 1% (two-tailed) respectively. All regressions are performed with robust standard errors. *t* - statistics based on robust standard errors are reported in parentheses. *MP* is the market price per share of firm *j* in year *t* three months after the balance sheet date. *EPS* is the earnings per share based on PAT for firm *j* in year *t*. *BVPS* is the book value of equity per share for firm *j* in year *t*.

As evident, coefficients on *EPS* and *BVPS* are positive and significant at better than the 5 percent level in every year and 1 percent level in most of the years. In general, as the estimated coefficient for *EPS* declines from one year to the next, the estimated coefficient for *BVPS* increases, and vice-versa. As can be observed, *EPS* response coefficient declines from 13.615 to 5.240 in 2007-2008 and *BVPS* estimated coefficient increases from 1.126 to 1.392. Similarly, decline in *EPS* estimated coefficient from 10.206 to 2.287 in 2010-2011 is set-off by increase in *BVPS* estimated coefficient from 0.540 to 1.520. The Adjusted R^2 of the yearly cross-sectional regressions of *MP* on *EPS* and *BVPS* ranged from 0.383 in 2010-2011 to 0.614 in 2008-2009. The Adjusted R^2 of the yearly cross-sectional regressions of *MP* on *EPS* ranged from 0.248 in 2010-2011 to 0.604 in 2008-2009 while yearly cross-sectional regressions of *MP* on *BVPS* ranged from 0.336 in 2008-2009 to 0.526 in 2007-2008.

The Adjusted R^2 for the panel cross-sectional time series regression indicates that *EPS* and *BVPS* jointly explain about 0.470 of the cross-sectional variation in share prices. Overall, the results are significant for the regression coefficient as well as for the regression model ($Wald \chi^2 = 123.09$; $p < 0.01$). The coefficient estimates of *EPS* ($\beta = 5.855$; $p < 0.05$) and *BVPS* ($\beta = 1.124$; $p < 0.01$) are significantly positive and consistent with past research (Collins *et al.*, 1997; Ou and Sepe, 2002), thus, confirming the value relevance of *EPS* and *BVPS* for firms in the sample. The significantly positive coefficient estimates for the panel and yearly cross-sectional regressions support the conjecture that both *EPS* and *BVPS* are significantly positively related to share prices. It indicates that a one unit increase in *EPS* is expected to generate 5.855 times unit increase in *MP*, while a unit increase in *BVPS* is expected to generate a *MP* increase of 1.124 units per share.

Results of panel data of Value Relevance Model 2 shows that *EPS* individually explains about 0.426 of the variation in *MP* ($Wald \chi^2 = 10.65$; $p < 0.01$). The coefficient on *EPS* ($\beta = 7.768$; $p < 0.01$) is positive and significant at 1 percent level. Results of panel data of Value Relevance Model 3 reveal that *BVPS* individually explains about 0.362 of the variation in *MP*. The coefficient on *BVPS* ($\beta = 2.426$; $p < 0.01$) is also positive and significant at 1 percent level ($Wald \chi^2 = 100.60$; $p < 0.01$). It is also evident that the incremental value relevance of *EPS* (Adjusted R^2_{EPS}) is about 2.454 times more in magnitude than the incremental value relevance of *BVPS* (Adjusted R^2_{BVPS}), i.e., 0.108 vs. 0.044. This is visible in results of yearly cross-sectional regressions also. The incremental explanatory power of *EPS*

increases and decreases over time but it always remains greater than the incremental explanatory power of *BVPS* except for the year 2010-2011. In all the years under analysis, magnitude of coefficient on *EPS* is more than the coefficient on *BVPS*. Further, the value for Adjusted R^2 s obtained from Value Relevance Model 2 is more than that of Model 3 except for the year 2010-2011. Overall, these results confirm the findings of Oyerinde (2009) that *EPS* is the single accounting number that is reported most often in media and receives the most attention of investors.

Thus, the findings based on the price model strongly support **H1a** that *there is a positive relationship between market value of a firm represented by share prices and accounting information represented by EPS and BVPS*. The results for the Value Relevance Model 1 are also consistent with the findings obtained from the developed markets (Collins *et al.*, 1997; Francis and Schipper, 1999; Hellstrom, 2006). For e.g., in the present study, *EPS* and *BVPS* jointly explained 0.470 of the cross-sectional variation in *MP*, which in the Collins *et al.* (1997), a benchmark in the value relevance literature, was 0.540. The yearly cross-sectional regressions of *MP* on *EPS* and *BVPS* in the present study ranges from 0.383 to 0.614, which is also consistent with the findings of Collins *et al.* (1997), which obtained 0.502 percent to 0.754. These results suggest that BSE-listed companies have earnings and book values that generally display properties similar to those in developed markets.

In addition, when comparing the results of present study with those of previous studies in emerging markets, the *EPS* and *BVPS* of BSE-listed companies appear more value relevant. For e.g., Ragab and Omran (2006) revealed that earnings and book values explained about 0.400 of the variations in stock prices during 1998-2002 in the Egyptian equity market, being 0.07 lower than results of present study. Similarly, Bae and Jeong (2007) investigated the value relevance of earnings and book values of the Korean firms during 1987-1998. Their results showed that earnings and book values explained 0.340 of the variations in security prices, which was 0.130 lower than for BSE-listed companies. Results of this study are also comparable with prior value relevance studies in India, which provide support for the value relevance of dividend, and return on net worth.

In summary, the findings for the price regressions provide convincing evidence that the *EPS* and *BVPS* for the sample of BSE-listed firms reported played an important role in equity valuation for the period 2006-2010. The results confirm with those found in mature capital markets. Interestingly, the results

show that *EPS* and *BVPS* are more value relevant in India than other emerging markets. The results presented here are also more significant than those found by earlier Indian-based studies on value relevance.

6.3.2 Changes in the Combined and Incremental Value Relevance of Accounting Information

Studies based on the investigation of changes in the value relevance of earnings and book values have found that the incremental value relevance of *EPS* has declined over a period of time, but it has been offset by an increased incremental value relevance of *BVPS*. Thus, overall the combined value relevance of these two accounting measures has not declined (Collins *et al.*, 1997; Francis and Schipper, 1999; Lev and Zarowin, 1999, Jang *et al.*, 2002). In this section, it is determined whether there are

any significant differences across time in the combined or in the relative incremental value relevance of *EPS* and *BVPS*. The Adjusted R^2_T obtained from Value Relevance Model 1 and incremental value relevance of *EPS* (Adjusted R^2_{EPS}) and *BVPS* (Adjusted R^2_{BVPS}) were regressed on a time-trend variable (*TIME*). The significant regression coefficient of explanatory variable (*TIME*) has been used as an indicator of change in the combined and incremental value relevance of *EPS* and *BVPS*. The value relevance is expected to have declined (increased) over a period of time if the regression coefficient on *TIME* turn out to be significantly negative (positive). Table 4 presents the results of regressing combined, and incremental *EPS* and *BVPS* on *TIME*-trend variable.

Table 4: Regression of the Adjusted R^2_T , Adjusted R^2_{EPS} and Adjusted R^2_{BVPS} on a Time-trend Variable

$Adj.R^2_T = \delta_0 + \delta_1 TIME + e_{it}$								(i)
$Adj.R^2_{EPS} = \theta_0 + \theta_1 TIME + e_{it}$								(ii)
$Adj.R^2_{BVPS} = \lambda_0 + \lambda_1 TIME + e_{it}$								(iii)
δ_0	δ_1	Adj. R^2	θ_0	θ_1	Adj. R^2	λ_0	λ_1	Adj. R^2
0.702*** (12.97)	-0.052* (-2.70)	0.707	0.183* (2.55)	-0.017 (-0.97)	0.087	-0.028 (-0.81)	0.022 (1.43)	0.411

Note: *, **, *** Significant at 10%, 5%, and 1% (two-tailed) respectively. All regressions are performed with robust standard errors. *t*-statistics based on robust standard errors are reported in parentheses.

The results from regressing the Adjusted R^2 values of combined and incremental *EPS* and *BVPS* on a time-trend variable demonstrate that there is a significant decline in the combined R^2 value over the sample period ($\delta_1 = -0.052$, $p < 0.10$). However, the coefficients on the *TIME* variable for incremental *EPS* and incremental *BVPS* suggest that there is an insignificant decline in the incremental value relevance of *EPS* ($\theta_1 = -0.017$) and an insignificant increase in the incremental value relevance of *BVPS* ($\lambda_1 = 0.022$) over the sample period. These results are not in conformity with prior research which has demonstrated a significant decline in the incremental value relevance of earnings, but has been offset by the increased incremental value relevance of book values (Collins *et al.*, 1997; Francis and Schipper, 1999; Lev and Zarowin, 1999, Jang *et al.*, 2002). Thus, these results do not hold **H1b**, i.e., *the incremental and combined value relevance of accounting information changes over a period of time*.

VII. CONCLUSION

Consistent with expectations, the findings based on the price regressions provide evidence of the value relevance of *EPS* and *BVPS* for a sample of 1,205 firm-year observations for FY 2006 to FY 2010 BSE-listed firms. The results for the combined price regression are also consistent with the findings obtained from the developed markets. In addition, when comparing the results of present study with those of previous studies in emerging markets, as well India, the *EPS* and *BVPS* of BSE-listed firms appear to be more value relevant. There has been a significant decline in the combined value relevance of accounting information over the

sample period. MP is the primary dependent variable while *EPS* and *BVPS* are the two key independent accounting measures used in the study. The study could be extended by including more independent variables like cash flows, dividends, etc., for examining variation in share prices or by conducting pooled analysis.

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AUTHORS

First Author – Manisha Khanna, Research Scholar, Department of Business Management and Commerce, University Business School, Panjab University, Chandigarh, and Assistant Professor, Department of Commerce at Govt. PG College, Kalka. E-mail: manishakhanna123@yahoo.com