Value relevance of reported financials of NSE listed companies

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Abstract: The purpose of this paper is to examine value relevance of accounting information in Indian stock market. The study focuses exclusively on the listed firms under Nifty 100 from 2001 to 2015, and uses price and returns models. The findings under both models suggest that accounting information has the significant ability in influencing stock prices and stock returns during the entire period covered by this study. Further analysis shows that book value per share is more relevant for loss-making firms while earnings per share are more relevant for profit-making firms. Based on industry classification, the value relevance of accounting information reported is high in metal industry, infrastructure, energy, financial services, automobiles and services industry and low in consumption and pharma industry. Study concludes that accounting information is relevant for investment decisions and investors must focus on this information to make informed investment decisions.

Keywords: accounting information; value relevance; stock market; price model; returns model; NSE; India; metal industry; infrastructure; energy; financial services; automobiles; services industry; loss making firms; profit making firms.

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1 Introduction

The financial reporting system is evolving in the world (Bhatia, 2018) and the disclosure requirements and practices have to constantly respond to changing requirements of the users. When FASB and IASB set standards for financial reporting, they go by the objective of financial reporting which is "to provide information that is useful to present and potential investors and creditors and others in making investment, credit and similar resource allocation decisions". For accounting information to be useful for decision making it is essential that it is relevant for decision making and it must capture the economic substance of the transactions, events, or circumstances it describes and the information needs to be complete, neutral and free from material errors. Reported financial information is expected to influence the actions of users of that information (Bhatia, 2017).

Capital markets research is a broad area of research that originated from seminal work of Ball and Brown (1968), it examines the relation between financial statement information and capital markets. The concept of value relevance is conceptualised in literature as the ability of accounting information to explain stock price or stock returns or both (Collins et al., 1997) and it is measured by the statistical association between accounting information and stock prices or stock returns (Francis and Schipper, 1999). Accounting information is considered to be relevant if it is significantly related with market value of the company (Holthausen and Watts, 2001) and if there is no significant relation it can be concluded that accounting information is not relevant (Pervan and Bartulović, 2014).

Information approach and measurement approach are two common major approaches used in value relevance studies (Collins et al., 1997). According to Amir et al. (1993), information approach considers accounting information as relevant if the stock prices react to the release of accounting information. As per Ball and Brown (1968), usefulness of accounting information is determined by observing the reactions of stock market to specific accounting information. In the mid-1990s, most of the value relevance studies shifted to measurement approach, which is rooted in the theoretical framework of equity valuation (Ohlson, 1995; Beisland, 2009). As per Ohlson (1995), the market value of the firm is expressed as a linear function of earnings, book value and other relevant accounting information. The approach measures the explicit relation between market indicators of the value of the company and accounting information by using the explanatory power of regression analysis (Collin et al., 1997).

The voluminous published research in this area is an indication of the demand for capital market research since the seminal works of Beaver (1968) and Ball and Brown (1968), who provide evidence of security market reactions to earnings announcements. Despite extensive literature in this area of research, it is important to note that the majority of literature is conducted in developed markets and that there are few studies

which are conducted in emerging markets like India. Prior literature has empirically examined the value relevance of accounting information in Indian context (Varun, 2012, 2014; Sharma, 2014; Khanna, 2014; Srinivasan and Narasimhan, 2010; Vishnani and Shah, 2008; Mulenga and Bhatia, 2017; Bhatia and Mulenga, in press) however none of these studies used:

1 both price and returns models

2 decomposed total explanatory power into components

3 partition the sample into sub-samples based on earnings signs and industry classification.

Our study is motivated by these gaps in value relevance studies based in India. As far as we are aware, this is the first study which addresses the above mentioned gaps. The objectives of this study are

1 To examine the ability of earnings per share and book value per share to influence stock prices of NSE-listed firms by using price model.

2 To examine the ability of earnings levels and change in earnings level to influence stock returns of NSE-listed firms by using returns model.

For conducting analysis, the study uses Nifty 100 listed companies as its sample from 2001 to 2015. The choice of Nifty 100 is necessitated by the fact that is a well diversified 100 stock index accounting for major sectors of the Indian economy and is nearly 77% of the free float market capitalisation of equity in India is captured by Nifty 100 as on March 31, 2015. Nifty 100 is truly representative of stock market in India and is therefore been taken for the study. We investigate the value relevance by using both the price and returns model and it is tested via the statistical association between stock prices (stock returns) and accounting information; the analysis has been carried out with pooled as well as cross sectional data. This study is important not only because of the lack of evidence in Indian stock market but also because of the importance of accounting information to Indian stock investors in making informed investment decisions. Another contribution that our study has is that we compared the explanatory power of earnings per share and book value per share with the earnings levels and earnings changes by decomposing the explanatory power into three components by using similar technique derived by Theil (1971). In order to gain more insight on the value relevance of accounting information, we partition our sample into sub-samples based on the earnings signs and industry classification.

The findings of our study as per price model indicate that: EPS and BVPS jointly and individually are positively and significantly related with stock prices of NSE listed firms; the incremental information content of BVPS is greater than incremental information content of EPS. Based on earnings signs, for profit making firms EPS and BVPS are positive and significant, however the incremental information content of EPS is more significant than that of BVPS. For loss making firms EPS and BVPS are positively and significantly related to stock prices, however, BVPS is more strongly related to stock prices than EPS. Based on industry classification, the results show noticeable difference among sectors. The value relevance of accounting information reported to be high in metals industry, infrastructure, energy, financial services and automobile industry, and is reported to be low in consumption and pharma industry.

The findings of our study as per return model indicate that: earnings level and change in earnings level jointly and individually have positive and significant influence on stock returns; change in earnings level has greater information content as compared to earnings level. Based on earnings signs, for profit-making firms' earnings level and change in earnings level significantly relate to stock returns, and investors accord more relevance to earnings than to changes in earnings. For loss making firms earnings level and change in earnings level jointly are insignificant, whereas individually the variables influence the stock returns. Based on industry classification in returns model, the value relevance of earnings levels and changes in earnings level are high in metal, auto, consumption, pharma and energy industry and low in infrastructure, financial services and service industry.

2 Literature review

Value relevance research is an area within capital market-based accounting research, its historical development and comparison among different countries have increased over a period of time. The reason for increase in literature is the notion raised that accounting information turned out to be less relevant for investors (Azeem and Kouser, 2011; Amir and Lev, 1996; Lev and Sougiannis, 1996; Goodwin and Ahmad, 2006). Value relevance is termed as ability of a financial statement to explain the market numbers (Srinivasan and Narasimhan, 2010; Collins et al., 1997). As per Kothari (2001) the demand for capital markets research comes from four sources that are:

1 tests of capital market efficiency

2 positive accounting theory

3 disclosure regulation

4 fundamental analysis and valuation.

Value relevance research started gaining fame in 1960s from the seminal works of Beaver (1968) and Ball and Brown (1968). They were the first researchers to explore the usefulness of financial accounting information to investors without making reference to theory, their work was based on information view (Kothari, 2001; Klimczak, 2009). Despite some difficulties that they face during designing experiments to test the implications and usefulness of accounting information to users, they established that market returns do respond to accounting information (Scott, 2003). In the mid-1990s, researchers shifted from information view to measurement view and tested value relevance of accounting information through its association with the stock prices or stock returns or both and using adjusted R^2 as a primary metric as well as variable coefficient (Bernard, 1995).

Collin et al. (1997) in a study involving US listed companies find that earnings per share and book value per share jointly explained about 54% of the variation in stock prices. The study also showed significant decline in the explanatory power of earnings per share and increase in the explanatory power of book value per share. Similar evidence was reported by Francis and Schipper (1999), Lev and Zarowin (1999) and Jang et al. (2002).

Chen et al. (2001) examined the relationship between accounting information represented by earnings per share, book value per share, and stock price in the Chinese stock market during 1991–1998. Using a price and returns models, they concluded that accounting information was value relevant according to both pooled cross-section and time-series regression.

El Shamy and Kayed (2005) examined value relevance of earnings per share and book value per on market share price of listed companies in Kuwait stock market and concluded that earnings per share and book value per share significantly influence stock prices; however the incremental explanatory power of earnings per share is greater than that of book values per share for the total sample and profit making firms. Similarly, Alfaraih and Alanezi (2011) in their study examined the usefulness of earnings per share and book value for equity valuation in Kuwait stock market and found that the earnings per share and the book value per share individually and jointly influences stock prices (stock returns). Additionally, variables like firm size, industry categories, and earnings signs significantly influence stock prices and not stock returns.

Recent study based in Korea by Kwon (2018) concluded that the value relevance of book value, accounting earnings, operating income, cash flows, and operating cash flows significantly changed before and after K-IFRS adoption; however, inconsistent results were reported by study in a carried out in South Africa by Negash (2008) where it was concluded that value relevance of accounting information did not improve after post-liberalisation in South Africa.

Khanna (2014) in her paper on 'Value relevance of accounting information: an empirical study of selected Indian firms' concluded that earnings per share and book value per share of BSE-listed firms appear to be more value relevant. However, there has been a significant decline in the combined value relevance of earnings per share and book value per share over time.

Varun (2014) in a study of Indian firms over the period 2006–2011 tested differential ability of earnings and book values to influence market value of equity. The conclusion of the study is that the abnormal earnings and book value are relevant for explaining the market value of equity while earning components (accruals and cash flows) hold little relevant for investors.

Vishnani and Shah (2008) also carried out a study on the value relevance of accounting information by using a sample of listed Indian companies. Their study focused on impact of cash flow reporting. The study reveals that financial statements have negligible value relevance, however; there is significant relation between ratios based on the financial statements and stock market indicators. The results are consistent with Sharma et al. (2012).

To the best of our knowledge no study based in India has addressed the value relevance of EPS and BVPS using both price model and returns model; also no other study analysed the value relevance based on industry classification and firms' profitability by using the incremental explanatory power of EPS, BVPS, earnings level and changes in earnings level.

3 Research methodology

3.1 The research questions

The previously summarised literature on the value relevance of accounting information is carried out on various accounting figures, of which earnings per share and book value per share dominate literature. Researchers are interested in these key variables as these variables are proxy for the financial information presented in balance sheet and income statement (Oyerinde, 2009; Alfaraih and Alanezi, 2011). Prior literature has empirically examined the value relevance of accounting information in Indian context (Varun, 2012, 2014; Sharma, 2014; Khanna, 2014; Srinivasan and Narasimhan, 2010; Vishnani and Shah, 2008) however none of these studies used:

1 both price and returns models

2 decomposed total explanatory power into components

3 partition the sample into sub-samples based on earnings signs and industry classification. Our study is motivated by these gaps in value relevance studies based in India.

The main research questions are following:

1 Does EPS and BVPS influence the stock prices of NSE-listed firms?

2 Does Earnings level and change in earnings level influence stock returns of NSE-listed firms?

The following sub-questions flow from the first research question:

1 Does the incremental explanatory power of EPS, BVPS and explanatory power common to both EPS and BVPS influence the stock prices?

2 Does the incremental explanatory power of EPS, BVPS and explanatory power common to both EPS and BVPS differ for profit making and loss making firms?

3 Does the incremental explanatory power of EPS, BVPS and explanatory power common to both EPS and BVPS differ based on industry classification?

The following sub-questions flow from the second research question:

1 Does the incremental explanatory power of earnings level, changes in earnings level and explanatory power common to both earnings level and changes in earnings level influence the stock returns?

2 Does the incremental explanatory power of earnings level, changes in earnings level and explanatory power common to both earnings level and changes in earnings level differ for profit making and loss making firms?

3 Does the incremental explanatory power of earnings level, changes in earnings level and explanatory power common to both earnings level and changes in earnings level differ based on industry classification?

3.2 Research design

3.2.1 Sample and data

The data for this study obtained from the annual financial reports of NSE-listed firms under Nifty 100 through Prowess database maintained by the Centre for Monitoring the Indian Economy (CMIE). The period considered for the study is from 2001 to 2015, 15 years. In India converged accounting standards are implemented from 2015 to mitigate the effect of these changes data post 2015 is not considered after adjusting for data availability, this study has a final sample of 1,216 and 1,181 firm-years for price and returns model. Following are the constituents of the study.

Table 1 Constitutes of sample

S/no.	*Industry name*	*Price model sample*		*Returns model sample*	
		Observations	*Percentage*	*Observations*	*Percentage*
1	Automobile	109	8.96	137	11.60
2	Consumption	166	13.65	163	13.80
3	Energy	163	13.40	158	13.38
4	Metals and mining	89	7.32	85	7.20
5	Infrastructure	101	8.31	87	7.41
6	Pharma	148	12.17	132	11.18
7	Services	144	11.84	137	11.60
8	Financial services	296	24.34	282	23.95
	Total	1,216	100	1,181	100

3.2.2 Variable measurement

This study focuses on the following variables: stock prices, stock returns, earnings per share, book value per share, earnings levels and earnings changes. The study applied logarithmic transformation on price and returns models variables in order to attain more accurate results by reaching the normality of data for each variable (Glezakos et al., 2012; Kimouche and Rouabhi, 2016) and avoid the problem of scaling effects and heteroskedasticity, following Alfaraih and Alanezi (2011), consistent with recommendation made by Kothari and Zimmeman (1995).

3.2.3 Valuation models used in assessing value relevance of accounting information

In order to measure the value relevance of financial accounting information, we employed two valuation models. The first model is the price model introduced by Ohlson in 1995, which shows how firm's market value is related to both earnings per share and book value per share. The second model is the return model, which includes both earnings levels and earnings changes as explanatory variables in determining stock returns as in Easton and Harris (1991).

3.2.3.1 Price model

The price model made a hit in the market-based research and has been successfully tested in a number of studies (Varun, 2014; Khanna, 2014; Collins et al., 1997; El Shamy and Kayed, 2005; Alfaraih and Alanezi, 2011). The following price model used in this study to provide insight on how earnings per share and book value per share can explain the variation in stock prices.

$$P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVPS_{it} + \varepsilon_{it} \tag{1}$$

Based on the above price model, we use similar technique derived theoretically by Theil (1971) and applied by Collins et al (1997) and El Shamy and Kayed (2005) to compare the explanatory power of earnings per share and book value per share on stock price per share by decomposed total explanatory power into three components:

1 the incremental explanatory power of earnings per share

2 the incremental explanatory power of book value per share

3 the explanatory power common to both earnings per share and book value per share.

In order to calculate the mentioned three components, the adjusted R^2 for the following equations are estimated.

$$Pit = \gamma_0 + \gamma_1 EPS_{it} + \varepsilon_{it} \tag{2}$$

$$Pit = \delta_0 + \delta_1 BVPS_{it} + \varepsilon_{it} \tag{3}$$

The adj.R^2 from models 1–3 is used as the primary metric to measure value-relevance and denoted as adj.$R^2_{(1)}$, adj.$R^2_{(2)}$ and adj.$R^2_{(3)}$ for models 1, 2 and 3, respectively. The incremental explanatory power of earnings per share (incr.EPS) calculated by taking the explanatory power adj.$R^2_{(1)}$ from model 1 less the explanatory power adj.$R^2_{(3)}$ from model 3; the incremental explanation power of book value per share (incr.BVPS) calculated by taking the explanatory power adj.$R^2_{(1)}$ from model 1 less the explanatory power and adj.$R^2_{(2)}$ from model 2. The remaining adj.$R^2_{(1)}$ –incr.EPS – incr.BVPS represents the explanatory power common to both earnings per share and book value per share (incr.Com).

Where

Pit	closing stock prices of firm i of financial year ending at year t
EPS_{it}	earnings per share for firm i in year t
$BVPS_{it}$	book value per share for firm i in year t
t	time period of the sampled companies (2001–2015)
$\beta, \gamma, \delta. \varphi$	coefficient of regression models
β_0	capture the influence of other variables that have been excluded from the model but exercise some influence on the stock prices.

3.2.3.2 Returns model

To further test the value relevance of accounting information, a returns model has also been used in this study in addition to the price model. In particular, the model incorporates both earnings levels and earnings changes deflated by previous stock prices as independent variables in explaining the market stock returns (Easton and Harris, 1991) following numerous prior value-relevance studies (Francis and Schipper, 1999; Alfaraih and Alanezi, 2011). The following returns model used in this study is expressed in the following form:

$$R_{it} = \beta_0 + \frac{\beta_1 EPS_{it}}{P_{it-1}} + \frac{\beta_z \Delta EPS_{it}}{P_{it-1}} + \varepsilon_i \tag{4}$$

Based on the above returns model, this study also compare the explanatory power of earnings levels and earnings changes on stock returns by decomposed total explanatory power into three components:

1 the incremental explanatory power of earnings levels

2 the incremental explanatory power of earnings changes

3 the explanatory power common to both earnings levels and earnings changes to.

In order to calculate the mentioned three components, the adj.R^2 for the following equations is estimated:

$$R_{it} = \gamma_0 + \frac{\gamma_1 EPS_{it}}{P_{it-1}} + \varepsilon_i \tag{5}$$

$$R_{it} = \alpha_0 + \frac{\alpha_1 \Delta EPS_{it}}{P_{it-1}} + \varepsilon_{it} \tag{6}$$

The adj.R^2 from models 4–6 is used as the primary metric to measure value-relevance and denoted as adj.$R^2_{(4)}$, adj.$R^2_{(5)}$ and adj.$R^2_{(6)}$ for models 4, 5 and 6 respectively. The incremental explanatory power of earnings levels (incr.EPS_{it}/P_{it-1}) calculated by taking the explanatory power adj.$R^2_{(4)}$ from model 4 less the explanatory power adj.$R^2_{(6)}$ from model 6; the incremental explanation power of earnings changes (incr. $\Delta EPS_{it}/P_{it-1}$) calculated by taking the explanatory power adj.$R^2_{(4)}$ from model 4 less the explanatory power and adj.$R^2_{(5)}$ from model 5. The remaining adj.$R^2_{(4)}$ –incr.EPS_{it}/P_{it-1} –incr.$\Delta EPS_{it}/P_{it-1}$ represents the explanatory power common to both earnings levels and earnings changes (incr.Com).

4 Analysis and results

4.1 Descriptive statistics

The descriptive statistics of this study for the independent and dependent variables are presented in Table 2. For returns model variables (stock returns, earnings levels, and earnings changes), Table 2 shows that the mean (median) of stock returns of NSE-listed firms over the 15-years period was 0.42 (0.16) ranging from 0.97 to 44.18. However, the

mean value of stock returns shown in the table tended to be higher than the median value, which indicates that the stock returns distribution was positively skewed. The highest value of standard deviation of accounting information is perceived in earnings changes and lowest standard deviation is recorded in earnings levels. The standard deviation values after natural log transformation are well below 3 which suggest the absence of the outliers (Pallant, 2007). As per the constructed value, the highest average value of accounting information is indicated by stock returns. In the price model variables the results in the table show that the distribution of price model was also positively skewed like in returns model.

Table 2 Descriptive statistics for firm year-observation 2001–2015

Variable	*N*	*Mean*	*Median*	*Min*	*Max.*	*Std. dev.*
P_{it}	1,216	5.76	5.81	0.10	8.50	1.21
R_{it}	1,181	–1.29	–1.19	–6.75	3.79	1.33
EPS_{it}	1,216	3.06	3.27	–5.73	6.02	1.39
$BVPS_{it}$	1,216	4.88	5.01	0.00	7.83	1.10
EPS_{it}/P_{it-1}	1,181	–2.30	–2.50	–6.53	5.73	1.36
$\Delta EPS_{it}/P_{it-}1$	1,181	–3.67	–3.85	–9.40	5.67	1.50

4.2 Correlation matrix analysis and multi-collinearity

The study uses Pearson correlation matrix and variance inflation factor (VIF) to test the probable degree of multi-collinearity among the variables used in the study. Table 3 depicts the results of correlation analysis and of collinearity statistic for price and returns model. The results of correlation analysis highlights that the earnings per share and book value per share are positively and significantly correlated with stock prices and with each other. The highest correlation coefficient is 63% (between BVPS and P), followed by 58% (between EPS and P) which is a strong positive correlation.

Accounting variables EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ influence stock returns and are positively and significantly correlated with stock returns. The highest correlation coefficient is 21% (between $\Delta EPS_{it}/P_{it-1}$ and R_{it}), followed by 20% (between EPS_{it}/P_{it-1} and R_{it}). Further, correlation coefficient and VIF found to be well within acceptable limits and indicate the absence of multicollinearity in price and returns model.

Table 3 Pearson correlations coefficient for firm year observation 2001–2015

Variable	*Price model*			*Variable*	*Returns model*		
	P_{it}	EPS_{it}	$BVPS_{it}$		R_{it}	EPS_{it}/P_{it}	$\Delta EPS_{it}/P_{it-1}$
P_{it}	1.00			R_{it}	1.00		
EPS_{it}	0.58**	1.00		EPS_{it}/P_{it}	0.20**	1.00	
$BVPS_{it}$	0.63**	0.63	1.00	$\Delta EPS_{it}/P_{it-1}$	0.21**	0.664	1.00
VIF		1.86	2.33			1.90	1.87

Note: **Correlation is significant at a level of 1% and 10%, respectively.

4.3 Hausman test

The study also employed both fixed effect model and random effect model in the estimation process, however Hausman test was carried out to check robustness among the two. The results of Hausman test presented in Table 4 indicate that FEM is the most appropriate and consistent to explain the influence of EPS and BVPS (EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$) on stock prices (stock returns) in models 1, 2 and 3 (4, 5 and 6).

Table 4 The results of Hausman test for the total sample (price model)

	p-value < 0.05	*Model chosen*
Model 1	0.001 < 0.05	Fixed effect model
Model 2	0.000 < 0.05	Fixed effect model
Model 3	0.012 < 0.05	Fixed effect model

Table 5 Hausman test for the total sample (returns model)

	p-value < 0.05	*Model chosen*
Model 4	0.000 < 0.05	Fixed effect model
Model 5	0.000 < 0.05	Fixed effect model
Model 6	0.004 < 0.05	Fixed effect model

4.4 Regression results for the total sample

4.4.1 Price model

The results of the price model are presented in Table 6. EPS and BVPS (jointly) have positive and significant impact on stock prices at a level of 1% for pooled data. The value of the beta coefficient of EPS and BVPS is 0.265 and 0.478, it signifies that a unit increase in EPS (BVPS) will leads to 26.5% (47.8%) increase in market stock prices (P). The F-statistic is significant and the value of the adj.R^2 indicate that EPS and BVPS jointly explain about 45% (adj.R^2 = 0.450) of the variation in stock prices. The results obtained from the year by year price regression support pooled data results except for the year 2001, 2002, 2003, 2004, 2005 and 2006. The coefficient of EPS is positive and significant for all years except for the year 2002, 2004 and 2005, while BVPS are positive and significant for all years except for the year 2001, 2003, 2006 and 2011.

For equations (2) and (3) result given in Table 4 indicates that the EPS and BVPS individually are significantly related to market share prices in each year and all the years. The explanatory power for a model with BVPS as explanatory variable is higher (39.4%) than for a model where EPS is independent variable (adj.R^2 = 33.7). This indicates that the accounting information shown in the balance sheet through book value is more relevant than the information revealed in income statement through EPS.

The results of the decomposition of adj. R^2 in Table 7 indicate that BVPS add 11.3% which is higher as compared to 5.6% added by EPS. The common explanatory power of EPS and BVPS is 28.1%.

Table 6 Pooled and yearly cross-sectional regression results of stock prices on EPS and BVPS 2001–2015

Models:

$$Pit = \alpha_0 + \beta_1 EPS + \beta_2 BVPS + \varepsilon_{it} \quad (1)$$

$$Pit = \gamma_0 + \gamma_1 EPS + \varepsilon_{it} \quad (2)$$

$$Pit = \delta_0 + \delta_1 BVPS + \varepsilon_{it} \quad (3)$$

Dependent variable: stock price

Year	*N*	*1*			*2*		*3*	
		β_1	β_2	$Adj.R^2$	γ_1	$Adj.R_2$	δ_1	$Adj.R_2$
2001	61	0.328 (2.04)**	0.334 (1.39)	0.213	0.479 (4.00)***	0.200	0.664 (3.65)***	0.170
2002	63	0.199 (1.38)	0.725 (3.58)***	0.430	0.580 (5.48)***	0.39	0.933 (6.79)***	0.421
2003	68	0.609 (5.28)***	0.255 (1.63)	0.532	0.736 (8.59)***	0.521	0.816 (5.98)***	0.342
2004	69	0.348 (1.51)	0.583 (2.87)**	0.508	0.918 (7.59)***	0.454	0.848 (8.28)***	0.498
2005	72	0.141 (1.46)	0.580 (5.08)***	0.520	0.491 (6.26)***	0.350	0.700 (8.69)***	0.512
2006	77	0.660 (5.20)***	0.180 (1.46)	0.614	0.811 (10.91)***	0.608	0.703 (8.44)***	0.480
2007	83	0.460 (4.51)***	0.251 (2.31)**	0.575	0.647 (10.11)***	0.552	0.639 (8.65)***	0.474
2008	84	0.181 (2.41)**	0.506 (5.88)***	0.566	0.480 (7.32)***	0.388	0.646 (9.93)***	0.540
2009	89	0.099 (2.07)**	0.590 (7.34)***	0.492	0.249 (4.56)***	0.183	0.661 (8.94)***	0.473
2010	90	0.142 (2.22)**	0.572 (6.89)***	0.561	0.415 (6.69)***	0.330	0.686 (10.30)***	0.542
2011	91	0.829 (7.50)***	–0.111 (–1.11)	0.653	0.723 (13.03)***	0.652	0.539 (8.42)***	0.437
2012	91	0.407 (5.70)***	0.178 (2.22)**	0.560	0.521 (10.35)***	0.541	0.509 (7.89)***	0.405
2013	92	0.219 (3.62)***	0.381 (4.50)***	0.424	0.360 (6.33)***	0.300	0.541 (7.02)***	0.346
2014	93	0.104 (1.77)*	0.428 (4.92)***	0.343	0.256 (4.54)***	0.175	0.508 (6.77)***	0.328
2015	93	0.191 (2.77)**	0.332 (2.99)***	0.249	0.292 (4.66)***	0.184	0.483 (4.81)***	0.194
All years	1,216	0.265 (11.15)***	0.478 (15.87)***	0.450	0.503 (24.86)***	0.337	0.690 (28.15)***	0.394

Notes: ***, **, *Statistically significant at a level of 1%, 5% and 10% respectively.
Numbers in the parentheses are the corresponding t-statistics

Source: All the numerical figures in the table calculated from e-views

Table 7 The decomposition of adj.R^2

Inc.EPS = Adj.$R^2_{(1)}$ – Adj.$R^2_{(2)}$

Incr.BVPS = Adj.$R^2_{(1)}$ – Adj.$R^2_{(2)}$

Incr.Comm = Adj.$R^2_{(1)}$ – Incr.EPS – Incr.BVPS

Year	*Adj.$R^2_{(1)}$*	*Adj.$R^2_{(2)}$*	*Adj.$R^2_{(3)}$*	*Incr.EPS*	*Incr.BVPS*	*Incr.Comm*
2001	0.213	0.200	0.170	0.043	0.013	0.157
2002	0.430	0.319	0.421	0.009	0.111	0.310
2003	0.532	0.521	0.342	0.190	0.011	0.331
2004	0.508	0.454	0.498	0.010	0.054	0.444
2005	0.520	0.350	0.512	0.008	0.170	0.342
2006	0.614	0.608	0.480	0.134	0.006	0.474
2007	0.575	0.552	0.474	0.101	0.023	0.451
2008	0.566	0.388	0.540	0.026	0.178	0.362
2009	0.492	0.183	0.473	0.019	0.309	0.164
2010	0.561	0.330	0.542	0.019	0.231	0.311
2011	0.653	0.652	0.437	0.216	0.001	0.436
2012	0.560	0.541	0.405	0.155	0.019	0.386
2013	0.424	0.300	0.346	0.078	0.124	0.222
2014	0.343	0.175	0.328	0.015	0.168	0.160
2015	0.249	0.184	0.194	0.055	0.065	0.129
All years	0.450	0.337	0.394	0.056	0.113	0.281

Source: All the numerical figures in the table calculated from e-views

4.4.2 Returns model

The results of models for all years reveal that earnings levels and earnings changes jointly are significant at a level of 0.01. The value of the beta coefficient of independent variables, EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ is 0.112 and 0.092, which signifies that a unit increase in earnings levels (earnings changes) will lead to 11.2% (9.2%) increase in stock returns (R).

The regression results show that model is statistically significant and adj.R^2 indicates that EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ jointly explain about 4.9% of the variation in stock returns. Further analysis reveals that earnings levels and earnings changes jointly explain 29.5% and 20.3% variation in stock returns in 2002 and 2004 but the pooled data results shows low adj.R_2 which concludes that much of the variation is unexplained by the variables.

The results of equations (5) and (6) reveal that the beta coefficient of earnings levels (earnings changes) is significant. The value of this coefficient is 0.197 (0.145) which shows that its effect is 19.7% (14.5%) on stock returns of NSE-listed firms between 2001 and 2015, these findings are consistent with Alfaraih and Alanezi (2011) in Kuwait The regression results reveals that the model is statistically significant and the adj. R^2 for pooled cross-sectional time-series regressions indicates that the earnings levels and earnings changes individually explain about 4% and 4.2% of the variation in stock returns of NSE-listed firms between 2001 and 2015, respectively. The results of yearly analysis support pooled data results except in few years.

Table 8 Pooled and yearly cross-sectional regression results of stock prices on earnings levels and earnings changes 2001–2015

Models

$$Rit = \alpha_0 + \frac{\beta_1 EPS}{P_{it}} - 1 + \frac{\beta_2 \Delta EPS}{P_{it}} - 1 + \varepsilon_{it} \quad (4)$$

$$Rit = \gamma_0 + \frac{\gamma_1 EPS}{P_{it}} - 1 + \varepsilon_{it} \quad (5)$$

$$Rit = \delta_0 + \frac{\delta_1 \Delta EPS}{P_{it}} - 1 + \varepsilon_{it} \quad (6)$$

Dependent variable: stock returns

Year	*N*	*7*			*8*		*9*	
		β_1	β_2	*Adj.*R^2	γ_1	*Adj.*R^2	δ_1	*Adj.*R^2
2001	61	0.102 (0.60)	0.021 (0.17)	–0.013	0.124 (1.10)	0.003	0.075 (0.93)	–0.002
2002	61	0.278 (2.02)**	0.244 (2.36)**	0.295	0.489 (4.47)***	0.241	0.379 (4.68)***	0.258
2003	63	0.173 (0.83)	0.207 (1.43)	0.106	0.389 (2.68)***	0.091	0.295 (2.95)***	0.111
2004	67	0.456 (2.78)**	–0.093 (–0.77)	0.203	0.347 (4.28)***	0.208	0.201 (3.17)***	0.120
2005	68	0.089 (0.61)	0.119 (1.26)**	0.050	0.213 (1.97)**	0.041	0.158 (2.75)**	0.059
2006	73	0.152 (1.10)	–0.145 (–1.72)*	0.013	–0.055 (–0.05)	–0.014	–0.084 (–1.32)	0.010
2007	76	–0.186 (–0.95)	0.080 (0.57)	–0.013	–0.091 (–0.85)	–0.003	–0.030 (–0.40)	–0.011
2008	81	0.195 (1.38)	0.098 (0.88)	0.072	0.281 (2.73)***	0.074	0.204 (2.50)**	0.061
2009	85	–0.023 (–0.24)	0.095 (1.37)	0.001	0.040 (0.47)	–0.009	0.087 (1.44)	0.012
2010	89	0.375 (2.32)**	–0.026 (–0.29)	0.076	0.340 (3.05)***	0.086	0.122 (1.93)*	0.030
2011	90	–0.099 (–0.83)	0.163 (1.71)*	0.012	0.038 (0.42)	–0.009	0.111 (1.56)	0.016
2012	91	–0.094 (–1.03)	0.122 (1.72)*	0.011	–0.011 (–0.14)	–0.011	0.084 (1.39)	0.010
2013	91	0.279 (1.95)*	–0.075 (–0.66)	0.027	0.218 (2.02)**	0.033	0.071 (0.81)	–0.003
2014	92	–0.094 (–0.91)	0.114 (1.36)	–0.001	–0.027 (–0.30)	–0.010	0.078 (1.06)	0.001
2015	93	0.065 (0.56)	0.001 (–0.02)	–0.017	0.064 (0.70)	–0.005	0.024 (0.41)	–0.009
All years	1,181	0.112 (3.02)**	0.092 (3.45)***	0.049	0.197 (7.06)***	0.040	0.145 (7.27)***	0.042

Notes: ***, **, *Statistically significant at a level of 1%, 5% and 10% respectively.
Numbers in the parentheses are the corresponding t-statistics.

Table 9 provides the results of the decomposition of adj.R^2's. The results from the table reveal that $\Delta EPS_{it}/P_{it-1}$ add more to the overall explanatory of the model than EPS/P_{it-1}. The incremental content of $\Delta EPS_{it}/P_{it-1}$ is 0.9%. While the incremental content of EPS_{it}/P_{it-1} is only 0.7%. The common explanatory power of EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ is 3.3%.

Table 9 The decomposition of adj.R^2 in returns model

$\text{Inc.EPS} / P_{it-1} = \text{Adj.R}^2_{(7)} - \text{Adj.R}^2_{(9)}$

$\text{Incr.}\Delta EPS_{it} / P_{it-1} = \text{Adj.R}^2_{(7)} - \text{Adj.R}^2_{(8)}$

$\text{Incr.Comm} = \text{Adj.R}^2_{(1)} - \text{Incr.}\Delta EPS_{it} / P_{it-1} - \text{Incr.}\Delta EPS_{it} / P_{it-1}$

Year	*Adj.$R^2_{(7)}$*	*Adj.$R^2_{(8)}$*	*Adj.$R^2_{(9)}$*	*Incr.EPS/P_{it-1}*	*Incr.$\Delta EPS_{it}/P_{it-1}$*	*Incr.Comm*
2001	–0.013	0.003	–0.002	–0.011	–0.016	0.014
2002	0.295	0.241	0.258	0.037	0.054	0.204
2003	0.106	0.091	0.111	–0.005	0.015	0.096
2004	0.203	0.208	0.120	0.083	–0.005	0.125
2005	0.050	0.041	0.059	–0.009	0.009	0.050
2006	0.013	–0.014	0.010	0.003	0.027	–0.017
2007	–0.013	–0.003	–0.011	–0.002	–0.010	–0.001
2008	0.072	0.074	0.061	0.011	–0.002	0.063
2009	0.001	–0.009	0.012	–0.011	0.010	0.002
2010	0.076	0.086	0.030	0.046	–0.010	0.040
2011	0.012	–0.009	0.016	–0.004	0.021	–0.005
2012	0.011	–0.011	0.010	0.001	0.022	–0.012
2013	0.027	0.033	–0.004	0.031	–0.006	0.002
2014	–0.001	–0.010	0.001	–0.002	0.009	–0.008
2015	–0.017	–0.005	–0.009	–0.008	–0.012	0.003
All years	0.049	0.040	0.042	0.007	0.009	0.033

4.5 Regression results for partition of the sample (price model)

4.5.1 Based on the earnings signs

Based on the earnings signs, the total sample is partitioned into profit-making firms and loss-making firms. For profit-making firms-sub sample comprises of 970 observations, and for loss-making firms-sub sample comprises of 246 observations. Analysis of the results reveal that the beta coefficient of EPS and BVPS for both profit making and loss making firms is positive and significant. However, the incremental information content of EPS is relatively high in profit-making firms, while the incremental information content of BVPS is high in loss-making firms as shown in Table 10. These results imply that the profit making firms accord more value relevance to earnings per share, while the loss-making firms accord more value relevance to book value per share. These results confirm the findings of El Shamy and Kayed (2005), which show that the incremental content of EPS is high in profit-making firms, while the incremental information content of BVPS is high in loss making firms.

Table 10 Summary of regression results of stock prices on EPS and BVPS for profit and loss firms

Models:

$$Pit = \alpha_0 + \beta_1 EPSit + \beta_2 BVPSit + \varepsilon_{it} \quad (1)$$

$$Pit = \gamma_0 + \gamma_1 EPSit + \varepsilon_{it} \quad (2)$$

$$Pit = \delta_0 + \delta_1 BVPSit + \varepsilon_{it} \quad (3)$$

Sub-samples	β_1	β_2	$Adj.R^2$	γ_1	$Adj.R^2$	δ_1	$Adj.R^2$
Profit firms	0.583 (16.03)***	0.146 (4.05)***	0.468	0.694 (28.71)***	0.459	0.581 (21.73)***	0.327
Loss firms	0.058 (1.74)*	0.990 (16.35)***	0.608	0.315 (7.42)***	0.181	1.039 (19.41)***	0.605

Notes: *, **, ***Significant at 10%, 5%, and 1% (two-tailed), respectively;
Numbers in the parentheses are the corresponding t-statistics.

Table 11 The incremental explanatory power of EPS and BVPS for profit and loss firms

$\text{Inc.EPS} = \text{AdjR}^2_{(1)} - \text{Adj.R}^2_{(3)}$

$\text{Incr.BVPS} = \text{Adj.R}^2_{(1)} - \text{Adj.R}^2_{(2)}$

$\text{Incr.Comm} = \text{Adj.R}^2_{(1)} - \text{Incr.EPS} - \text{Incr.BVPS}$

Sub-samples	*N*	*Incr.EPS*	*Incr.BVPS*	*Incr.Com*
Profit firms	970	0.141	0.009	0.318
Loss firms	246	0.003	0.427	0.178

4.5.2 Regression results based on industry classifications (price model)

The industry classification adopted by us is same as that adopted by the NSE where the sample of listed firms are divided into eight categories, i.e., automobiles, consumption, energy, metals and mining, infrastructure, pharma, services and financial services. The results in Table 12 reveal noticeable difference among sectors in term of how the data fit the models and on the relative importance of earnings per share and book value per share. The best fit for the model was obtained for metals industry followed by infrastructure, energy, financial services, auto and services with EPS and BVPS explaining 74.8%, 69.5%, 68.5%, 64.2%, 61.7%, 52.5% of the variation in stock prices. This implies that the value relevance of EPS and BVPS reported to be high in metal industry, infra, energy, financial services, auto, and services industry. The lowest fit was obtained for consumption industry and pharma industry with EPS and BVPS explaining only 27.4% and 28.4% of the variation in stock prices, respectively. One of the possible reasons could be the nature of industry, investment opportunities, size of the firms and the type of products.

The results for decomposition of adj.R^2 for different sectors in Table 13 indicate that BVPS add more to the overall explanatory power of the valuation model than EPS for the metals industry, consumption, automobiles, energy, financial services, pharma, and infrastructure while EPS had superiority only in the case of services industry. These findings indicate how investors attribute more relevance on accounting information shown in the balance sheet than those shown in income statement in valuing stock prices

of metals, consumption, automobiles, energy, financial services, pharma and infrastructure industry.

Table 12 Summary of regression results of stock prices on EPS and BVPS for different industries estimated under OLS

Models:

$$Pit = \alpha_0 + \beta_1 EPS_{it} + \beta_2 BVPSit + \varepsilon_{it} \quad (1)$$

$$Pit = \gamma_0 + \gamma_1 EPSit + \varepsilon_{it} \quad (2)$$

$$Pit = \delta_0 + \delta_1 BVPSit + \varepsilon_{it} \quad (3)$$

Industry	*N*	β_1	β_2	*Adj.*R^2	γ_1	*Adj.*R^2	δ_1	*Adj.*R^2
Automobiles	109	0.277 (3.96)***	0.748 (7.34)***	0.617	0.600 (9.05)***	0.428	1.001 (11.89)***	0.565
Consumption	166	0.058 (0.98)	0.524 (7.08)***	0.274	0.210 (3.30)**	0.056	0.550 (7.96)***	0.274
Energy	163	0.189 (4.24)***	0.555 (9.37)***	0.685	0.495 (13.15)***	0.515	0.739 (17.44)***	0.652
Metals	89	0.175 (3.90)***	0.822 (11.65)***	0.748	0.438 (7.09)***	0.359	0.960 (14.61)***	0.707
Infrastructure	101	0.323 (3.96)***	0.514 (4.88)***	0.695	0.654 (12.95)***	0.625	0.861 (13.67)***	0.650
Pharma	148	0.209 (3.49)**	0.571 (4.71)***	0.284	0.332 (5.76)***	0.180	0.756 (6.68)***	0.229
Services	144	0.740 (8.39)***	–0.082 (–0.67)	0.525	0.693 (12.65)***	0.526	0.726 (7.75)***	0.292
Financial services	296	0.271 (4.54)***	0.746 (10.74)***	0.642	0.768 (17.31)***	0.503	0.990 (21.88)***	0.618

Notes: Numbers in the parentheses are the corresponding t-statistics.
***, **, and *represents that the variables are statistically significant at a level of 1%, 5% and 10%, respectively.

Table 13 The incremental explanatory power of EPS and BVPS for different industries under OLS

Inc.EPS = Adj.$R^2_{(1)}$ – Adj.$R^2_{(3)}$

Incr.BVPS = Adj.$R^2_{(1)}$ – Adj.$R^2_{(2)}$

Incr.Comm = Adj.$R^2_{(1)}$ – Incr.EPS – Incr.BVPS

Sub-samples	*Incr.EPS*	*Incr.BVPS*	*Incr.Com*
Automobiles	0.052	0.189	0.376
Consumption	0	0.218	0.056
Energy	0.033	0.17	0.482
Metals	0.041	0.389	0.318
Infrastructure	0.045	0.07	0.58
Pharma	0.055	0.104	0.125
Services	0.233	–0.001	0.293
Financial services	0.024	0.139	0.479

4.6 Regression results for partition of the sample (returns model)

To gain an insight into the relationship between earnings levels and earnings changes, the sample is partitioned into subsamples based on industry classification and firm's profitability.

4.6.1 Regression results based on earnings signs

Based on the earnings signs, the total sample is partitioned into profit firms and loss firms. For profit making firms-sub sample comprises of 943 observations and loss making firms-sub sample consisting of 238 observations. Analysis of the results reveals that for-profit making firms EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ jointly and individually are significant at a level of 1%. The value of the beta coefficient of EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ are positive and strongly associated with stock returns as evidenced by the coefficient of 0.232 and 0.152 in simple regression. The value signifies that there is a direct relationship between EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ on stock returns of NSE-listed firms and a unit increase in EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ will lead to 23.2% and 15.2% increase in stock returns, respectively.

For loss making firms, EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ jointly are insignificant, however individually the variables significantly influence stock returns. The value of the beta coefficient, EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ individually are 0.142 and 0.121. This signifies that its effect is only 14.2% and 12.1% on stock returns.

The results of the decomposition of adj.R^2's as reported in Table 14 indicate that EPS_{it}/P_{it-1} add 13.6% the overall explanatory of the model than $\Delta EPS_{it}/P_{it-1}$ in profit firms, while the incremental content of $\Delta EPS_{it}/P_{it-1}$ is only 0.1%. The common explanatory power of EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ is 36.4%. For loss making firms, the results of the decomposition of adj.R^2 indicate that $\Delta EP_{it}/P_{it-1}$ add 34.1% to the overall explanatory power of the model than EPS_{it}/P_{it-1}, while the incremental information content of EPS_{it}/P_{it-1} add 1.5%. The common explanatory power of EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ add 16.6%.

Table 14 Summary of regression results of stock returns on EPS_{it}/P_{it-1} and $\Delta EPSit/P_{it-1}$ for profit and loss firms estimated under OLS

Models:

$$Rit = \alpha_0 + \frac{\beta_1 EPS}{Pit} - 1 + \frac{\beta_2 \Delta EPS}{Pit} - 1 + \varepsilon_{it} \quad (7)$$

$$Rit = \gamma_0 + \frac{\gamma_1 EPS}{Pit} - 1 + \varepsilon_{it} \quad (8)$$

$$Rit = \delta_0 + \frac{\delta_1 \Delta EPS}{Pit} - 1 + \varepsilon_{it} \quad (9)$$

Sub-samples	β_1	β_2	$Adj.R^2$	γ_1	$Adj.R^2$	δ_1	$Adj.R^2$
Profit firms	0.133 (2.73)***	0.094 (3.02)***	0.048	0.232 (6.35)***	0.040	0.152 (6.48)***	0.042
Loss firms	0.098 (1.57)	0.062 (1.08)	0.034	0.142 (3.02)***	0.033	0.121 (2.79)***	028

Notes: Numbers in the parentheses are the corresponding t-statistics;
**, ***Significant at 5%, and 1% (two-tailed) respectively.

Table 15 The incremental explanatory power of EPS_{it}/Pi_{t-1} and $\Delta EPS_{it}/P_{it-1}$ for profit and loss firms

$Inc.EPS / P_{it-1} = Adj.R^2_{(7)} - Adj.R^2_{(9)}$

$Incr.\Delta EPS_{it} / P_{it-1} = Adj.R^2_{(7)} - Adj.R^2_{(8)}$

$Incr.Comm = Adj.R^2_{(7)} - Incr.EPS / P_{it-1} Incr.\Delta EPS_{it} / P_{it-1}$

Sub-samples	*N*	*Incr.EPS/P_{it-1}*	*Incr.$\Delta EPS_{it}/P_{it-1}$*	*Incr.Com*
Profit firms	943	0.136	0.001	0.364
Loss firms	238	0.015	0.341	0.166

Table 16 Summary of regression results of stock prices on EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ for different industries

$$Rit = \alpha_0 + \frac{\beta_1 EPS}{Pit} - 1 + \frac{\beta_2 \Delta EPS}{Pit} - 1 + \varepsilon_{it} \quad (7)$$

$$Rit = \gamma_0 + \frac{\gamma_1 EPS}{Pit} - 1 + \varepsilon_{it} \quad (8)$$

$$Rit = \delta_0 + \frac{\delta_1 \Delta EPS}{Pit} - 1 + \varepsilon_{it} \quad (9)$$

Dependent variable: stock returns

Industry	*N*	β_1	β_2	*Adj.R^2*	γ_1	*Adj.R^2*	δ_1	*Adj.R^2*
Automobiles	137	0.579 (4.17)***	0.052 (0.68)	0.148	0.621 (5.02)***	0.151	0.194 (2.70)**	0.044
Consumption	163	0.130 (2.03)**	0.071 (1.23)	0.077	0.182 (3.75)***	0.075	0.147 (3.36)***	0.060
Energy	158	0.445 (3.50)***	–0.035 (–0.43)	0.062	0.434 (3.50)***	0.067	0.023 (0.28)	–0.006
Infrastructure	85	0.147 (0.72)	0.074 (0.66)	–0.007	0.192 (1.00)	0.000	0.102 (0.96)	–0.001
Metals	87	(2.45)** 0.303	0.417 (4.82)***	0.347	0.554 (4.41)***	0.176	0.507 (6.27)***	0.308
Pharma	132	0.061 (0.44)	0.228 (2.54)**	0.065	0.254 (2.11)	0.026	0.249 (3.31)***	0.071
Services	137	0.042 (0.27)	0.167 (1.66)*	0.020	0.186 (1.43)	0.008	0.182 (2.19)**	0.027
Financial services	282	–0.089 (–1.05)	0.124 (2.12)**	0.016	0.065 (1.42)	0.004	0.072 (2.33)**	0.015

Notes: ***, **, *Statistically significant at a level of 1%, 5% and 10% respectively.
Numbers in the parentheses are the corresponding t-statistics.

4.6.2 Based on industry classifications (returns model)

The results in Table 16 reveal noticeable difference among sectors in term of how the data fit the model and on the relative importance of earnings levels and earnings changes. The value relevance of earnings levels and earnings changes reported to be high in the

metals industry followed by automobiles and consumption industry with earnings levels and earnings changes values explaining 34.7% and 14.8% of the variation in stock returns respectively. While the lowest fit was obtained for infrastructure industry, consumption and financial services with earnings levels and earnings changes values explaining only –0.7%, 7.7% and 1.6% of the variations in stock returns.

The results for decomposition of adj.R^2 for different sectors indicate that EPS_{it}/P_{it-1} add more to the overall explanatory of the valuation model than $\Delta EPS_{it}/P_{it-1}$ for automobiles, consumption, and energy while $\Delta EPS_{it}/P_{it-1}$ had superiority only for metals, pharma, services, financial services and infrastructure industry.

Table 17 The incremental explanatory power of EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ for different industries

$\text{Inc.EPS} / P_{it-1} = \text{Adj.}R^2_{(7)} - \text{Adj.}R^2_{(9)}$

$\text{Incr.}\Delta EPS_{it} / P_{it-1} = \text{Adj.}R^2_{(7)} - \text{Adj.}R^2_{(8)}$

$\text{Incr.Comm} = \text{Adj.}R^2_{(7)} - \text{Incr.EPS} / P_{it-1} \text{Incr.}\Delta EPS_{it} / P_{it-1}$

Sub-samples	*Incr. EPS/P_{it-1}*	*Incr. $\Delta EPS_{it}/P_{it-1}$*	*Incr.Com*
Automobiles	0.104	–0.003	0.047
Consumption	0.017	0.002	0.058
Energy	0.068	–0.005	–0.001
Infrastructure	–0.006	–0.007	0.006
Metals	0.039	0.171	0.137
Pharma	–0.006	0.039	0.032
Services	–0.007	0.012	0.015
Financial Services	0.001	0.012	0.003

4.7 Further analysis

The results of the OLS regression models are re-examined by using panel data regression techniques (fixed-effects and random effect model), consistent with Oyerinde (2009).

4.7.1 Price model

As shown in model 1, EPS and BVPS have positive and significant influence on stock prices at a level of 1%. This signifies that there is a direct relationship between variables. The result of adj.R^2 for the model is 0.687 and F-value is 29.32. This implies that EPS and BVPS jointly are able to explain 68.7% variation in NSE firm's stock prices. Highly significant values of F-statistics express that all the explanatory variables (EPS and BVPS) have strong ability to explain variation in dependent variable (stock prices). The results shown in price model indicate that investors relies more on the accounting information shown in balance sheet (BVPS) than in income statement (EPS) in valuing stock prices.

Table 18 Regression results of stock price on EPS and BVPS estimated under FEM

Models:

$$Pit = \alpha_0 + \beta_1 EPS + \beta_2 BVPS + \varepsilon_{it} \quad (1)$$

$$Pit = \gamma_0 + \gamma_1 EPS + \varepsilon_{it} \quad (2)$$

$$Pit = \delta_0 + \delta_1 BVPS + \varepsilon_{it} \quad (3)$$

Dependent variable: stock prices

Variable	*1*			*2*			*3*		
	Coef.	*t-stat.*	*Prob.*	*Coef.*	*t-stat.*	*Prob.*	*Coef.*	*t-stat.*	*Prob.*
Constant	1.997	13.36***	0.000	4.574	68.92***	0.000	1.763	11.71***	0.000
EPS	0.170	7.98***	0.000	0.388	18.95***	0.000	–	–	–
BVPS	0.664	18.71***	0.000	–	–	–	0.818	26.78	0.000
R^2		0.711			0.621			0.694	
Adj.R^2		0.687			0.589			0.669	
F-stat		29.32			19.73			27.42	
Prob.		0.000			0.000			0.000	
Total observ.		1,216			1,216			1,216	

Note: ***Significant at 1% (two-tailed) respectively.

Table 19 Regression results of EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ on stock returns (R_{it}) under FEM

Models:

$$Rit = \alpha_0 + \frac{\beta_1 EPS}{Pit} - 1 + \frac{\beta_2 \Delta EPS}{Pit} - 1 + \varepsilon_{it} \quad (4)$$

$$Rit = \gamma_0 + \frac{\gamma_1 EPS}{Pit} - 1 + \varepsilon_{it} \quad (5)$$

$$Rit = \delta_0 + \frac{\delta_1 \Delta EPS}{Pit} - 1 + \varepsilon_{it} \quad (6)$$

Dependent variable: stock returns

Model	*4*			*5*			*6*		
Variable	*Coef.*	*t-stat.*	*Prob.*	*Coef.*	*t-stat.*	*Prob.*	*Coef.*	*t-stat*	*Prob.*
Constant	–0.051	–0.40	0.69	–0.386	–3.55***	0.000	–0.527	–4.76***	0.000
EPS_{it}/P_{it-1}	0.318	6.76***	0.000	0.395	8.87***	0.000	–	–	–
$\Delta EPS/P_{it-1}$	0.139	4.70***	0.000	–	–	–	0.209	7.37***	0.000
R^2	0.175			0.158			0.140		
Adj.R^2	0.104			0.086			0.067		
F-stat	2.45			2.20			1.91		
Prob.	0.000			0.000			0.000		
No. of observ.	1,181			1,181			1,181		

Note: ***Significant at 1% (two-tailed) respectively.

4.7.2 Returns model

The following table presents the summary of the output of regression for model 4, 5 and 6 estimated by using panel regression techniques (FEM and REM). The results in model 4 indicate that the p-value for EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ are significant at a level of 1%. This suggests that EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ significantly influence stock returns of NSE-listed firms during the study period. The result of adj.R^2 for the model is 0.104 and F-value is 2.45, these values are significant for $p < 0.000$. This implies that EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ jointly explain 10.4% variation in NSE firm's stock returns.

The results of equations (5) and (6) indicate that EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ individually are significant at a level of 1%. Value of the beta coefficient of EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ is 0.395 and 0.209 which shows that its effect are 39.5% and 20.9% on stock returns of NSE-listed firms, respectively. It means there is a high positive significant influence on stock returns of NSE-listed firms between 2001 and 2015. The result of adj.R^2 for the models are 0.086 and 0.067, respectively, these values are significant for $p < 0.000$. This implies that EPS_{it}/P_{it-1} and $\Delta EPS_{it}/P_{it-1}$ individually are able to explain 8.6% and 6.7% variation in NSE firm's stock returns respectively, which concluding that much of the variations are unexplained by the variables.

5 Summary and concluding remarks

In this study an effort is made to examine the value relevance of accounting information with respect to the stock prices and stock returns of NSE-listed firms, by using price and returns model. Overall, the findings indicate that under both the models accounting information is relevant in explaining stock prices and stock returns during the entire period covered by this study. However, earnings per share and book value per share jointly and individually are more relevant than earnings levels and earnings changes. Further analysis reveals that the book value per share is more relevant for loss-making firms while earnings per share are more relevant for profit making firms. These results provide consistent evidence that financial accounting information of NSE-listed is relevant. Based on industry classification, the value relevance of earnings per share and book value per share reported to be high in metal industry, infrastructure, energy and financial services industry and low in consumption and pharma industry. One of the possible reasons could be the nature of industry, investment opportunities, size of the firms and the type of products. This study concludes that for NSE-listed firms, accounting information is relevant for investment decision during the entire period covered by this study and investors must focus on this information to take informed investment decision.

Regulators must have an adequate monitoring mechanism which regularly ensures that the accounting information presented by the listed firms is reliable and further improve the enforcement of accounting standards so as to improve the quality of accounting information used for investment purpose.

Further studies could measure the value relevance of accounting information in short term by using event study methodology like in the studies of Bayezid and Chowdhury (2010) and Menike and Wang (2013). other studies can make use of another set of reported accounting information such as operating cash flow per share, dividend per share, return on equity, return on assets, etc. for examining variation in stock prices and

stock returns. The study may also extended by looking to the bullish phase and bearish phase of the stock market while looking on the value relevance of accounting information. As converged international financial reporting standards have been implemented in India, study comparing value relevance of pre and post converged accounting standards can also be carried out. Lastly, it will be more important and interesting to see comparative studies on value relevance of financial accounting information between countries. This will allow for comparison between the results of the different countries.

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