EQUITY VALUATION WITH REFERENCE TO BOOK VALUE, EARNING & CASH FLOW

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Abstract: This study examines the value relevance of earnings Book values and Cash flows. Using a valuation model provided by Ohlson (1995), the study uses statistical association between stock prices and all the three variables i.e. earnings, Cash flows and book values to measure value-relevance of the accounting system. In the backdrop of relevance of accounting numbers for equity valuation, Ohlson (1995) and Feltham & Ohlson (1995) provide an objective valuation model based on abnormal earning. According to the models, the fundamental of valuation depends on abnormal earning (NLa). The study deals with the scrips listed at BSE on SENSEX. The results show that earnings and book values jointly and individually are positively and significantly related to stock prices.

Keywords: Abnormal Earning, Book Value, Operating Cash Flow, Equity Value

Background

The relevance of book value, earnings and cash flow in equity valuation is a well-researched area in accounting. Evidence in this area, however, has been mixing. In the backdrop of relevance of accounting numbers for equity valuation, Ohlson (1995) and Feltham & Ohlson (1995) provide an objective valuation model based on abnormal earning.

Our work is motivated by recent research in accounting, both theoretical and empirical. Ohlson (1995) and Feltham and Ohlson (1995), who base their theory of valuation on the residual income valuation model (RIVM), show that under certain conditions share price can be expressed as a weighted average of book value and earnings. The Ohlson and Feltham-Ohlson models have spawned much empirical research examining the comparative valuation relevance of the balance sheet and the income statement.

As a source of information for financial decision making financial statement numbers and their interpretation play the most significant role in fundamental analysis. While most research in this area has concentrated almost exclusively on explaining price by book value and reported earnings (or their components), our focus is on the relation between share price and book value and cash flow.

This paper conducts an empirical examination of valuation techniques of equity with a focus on a practical issue. Book value, cash flow and earnings approaches are equivalent when the respective payoffs are predicted “to infinity,” but practical analysis requires prediction over finite horizons. The paper assesses how the various techniques perform

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Review of Literature on Models of Earning, Book Value, and Equity Valuation

Based on models developed by Ohlson (1995) and Feltham, Ohlson (1995), a number of empirical studies have been conducted revealing different degrees of predictive ability of various earning components with respect to valuation. Valuation techniques are characterized as pro forma accounting methods with different rules for recognizing payoffs, and their relevant features are identified within a framework that expresses them as special cases of a generic accounting model. This framework refers to the reconciliation of the infinite horizon cash flow and accrual accounting models in Feltham and Ohlson (1995) and the finite-horizon synthesis in Penman (1996). It establishes conditions where each technique provides a valuation without error, with and without terminal values, and identifies when (seemingly different) calculations yield the same valuation. In particular, it demonstrates that DCF techniques with “operating income” specified in the terminal value are identical to models that specify accrual earnings as the payoff. Hence the comparison of DCF techniques with accrual accounting residual income techniques amounts to comparing different calculations of the terminal value in DCF analysis. This brings the focus to the critical practical problem, the determination of terminal values. (Penman & Sougiannis, January, 1995).

Kim and Kross (2005) find that the ability of earnings to predict future operating cash flows has been increasing for the 1973-2000 period. Looking at the abnormal share returns over a three-day window surrounding the earnings release days, Landsman and Maydew (2002) find an increase in abnormal returns, suggesting an increase in the information content or the value relevance of earnings. However, Brown et al. (1999) show that the increased R-squares are driven by the presence of scale effect in the level regression. After controlling for the scale factor’s coefficient of variation, they find a decline in value relevance, as measured by R-squares. In another stream of study, Banker et al. (2009) find a positive relation between the roles of accounting earnings in equity valuation and performance evaluation. Compared with cash flows, the role of accounting earnings has declined both in value relevance and performance evaluation.

Bernard (1995) was one of the first to gauge the value relevance of accounting data. He compared the explanatory power of a model in which share price is explained by book value and earnings versus a model of share price based on dividends alone. He found that the accounting variables dominate dividends, which is interpreted as confirming the benefits of the linkage between accounting data and firm value.

In their another paper Barth, Beaver, Hand and Landsman (2004), the authors attempted to find out whether and to which extent disaggregation of earning and imposing valuation model linear information structure (Linear Information Model or LIM) aid in predicting equity value across various industries. Under LIM the predicted values of the variables (abnormal earning, book value and so on) in t-th year are obtained treating the respective values of the said variables for (t-1) th year as independent variables. Hence, LIM is essentially AR (1) process. The first LIM is based on aggregate earning, LIM 2 disaggregates earning into cash flow and total accrual. LIM3 disaggregates earning into cash flow and four major components of accrual- change in receivables, change in inventory, changes in payables and depreciation. Then, both the predicted values obtained by using the LIM model and actual values (without LIM structure) have been used to forecast the equity share values. The major findings are: coefficients of abnormal earning and book value are significantly positive with and without LIM structure across industries. Disaggregating earning into cash flow and total accruals can enhance equity valuation prediction in the pooled regression. Valuation coefficients with and without imposing LIM structure differ significantly for almost all industries. Disaggregating total accruals into four components - change in receivables, change in inventory, and changes in payables and depreciation aid in predicting equity values under LIM but the coefficients are not significantly different from zero when LIM structure is not imposed.
Objective of the Study

The present study attempts to find out empirically the predictive ability of accounting based fundamentals namely book value, earning and cash flow in equity valuation mainly in the backdrop of models developed by Ohlson (1995) and Feltham-Ohlson (1995) in respect of SENSEX companies of the BSE (Bombay Stock Exchange) of India.

Research Design

The period of the study is of 5 Yrs (2007 – 2011). As per Ohlson (1995) cohesive theory of a firm’s value that relies on clean surplus in relation to identify a role for each of the three variables, earnings, book value and dividends. According to him, the change in book value (BV) shall equal earning minus dividend (net of capital contribution). This relation is called clean surplus relation which highlights that all changes in assets/liabilities unrelated to dividends must pass through the income statement.

\[ BV_t = BV_{t-1} + x_t - d_t \]  

Where \( x_t \) = Earning in period \( t \),  
\( d_t \) = Dividend in period \( t \)

Re-arranging equation (1), we get

\[ BV_t + d_t = BV_{t-1} + x_t \]  

Equations (1) and (2) show that dividend do not impact earning but reduces \( BV_t \). If dividend is not paid, book value increases by the amount of dividend. This conclusion is similar to dividend irrelevance of MM (1961) in market value context. The main of contention of MM is - dividend amounts to distribution of value - not creation thereof. Similarly, to the extent of dividend payment, investors claim on the book value reduces.

The paper goes in 3 steps: firstly book value, abnormal earnings, cash from operations and market value of equity prices of current year and preceding year is collected on BSE listed companies. Secondly a relationship is observed between with the lagged value of book value of assets and current year book value of assets (Eq. (3)). Then if this relationship is significant then the impact of lagged book value and lagged abnormal earnings can be analyzed on abnormal earnings of current year (Eq. (4)). Thirdly impact of current year abnormal earning and current year book value on current year’s market value of equity prices is analyzed (Eq. (4)). Fourthly cash flow as one more important relevant factor is introduced and its impact both lagged and current year’s value is also analyzed with current year abnormal returns and current year market value of earnings (Eq. (6&7).

Two models applied are:

Model 1: Abnormal Earning and Book Value

\[ NI_{it} = \text{abnormal earning value of equity of } i^{th} \text{ firm at the end of } t^{th} \text{ year} \]

\[ BV_{it} = \text{book value of equity of } i^{th} \text{ firm at the end of } t^{th} \text{ year} \]

\[ MV_{it} = \text{market value of equity of } i^{th} \text{ firm at the end of } t^{th} \text{ year} \]

Abnormal earning at time \( t \) \( NI_{it} \) equals \( NI_{t-1} - r * BV_{t-1} \) where \( NI \) is earning available to equity shareholders before extraordinary items and \( BV_{t-1} \) is the book value of the equity at the close of immediate preceding year, \( r \) is risk free rate of return.

\[ BV_{it} = \alpha + \beta BV_{t-1} + \epsilon \]  

\[ NI_{it} = \alpha + \beta NI_{t-1} + \beta BV_{t-1} + \epsilon \]  

\[ MV_{it} = \alpha + \beta NI_{t} + \beta BV_{t} + \epsilon \]  

Model 2: Abnormal Earning, Book Value and Operating Cash Flow (CFO)

\( CFO_{it} \) is operating cash flow of the \( i^{th} \) firm in \( t^{th} \) year

\[ NI_{it} = \alpha + \beta NI_{t-1} + \beta BV_{t-1} + \beta CFO_{t-1} + \epsilon \]  

\[ MV_{it} = \alpha + \beta NI_{t} + \beta BV_{t} + \beta CFO_{t} + \alpha \]  

Results & Discussions

1. The regression coefficients of the equations of Model 1 derived from pooling of cross-sectional data from 2006-2011 are reported in the following tables.

Table 1: Impact of Lagged Book Value on Current Book Value (Eq. 3)

<table>
<thead>
<tr>
<th>Predictors</th>
<th>R</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book Value Lagged</td>
<td>0.860</td>
<td>.000</td>
</tr>
</tbody>
</table>

The table shows that lagged book value has a high degree of impact on current year’s book value
of equity. The value of coefficient suggests that the book value \((BV_t)\) is related to book value lagged by one year \((BV_{t-1})\) positively in a manner which is statistically significant. Hence previous year’s book value makes a significant difference on the book value current year book value of equity.

Table 2: Impact of Lagged Book Value & Lagged Earning on Current Earning (Eq. 4)

<table>
<thead>
<tr>
<th>Predictors</th>
<th>R</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagged Book Value</td>
<td>.303</td>
<td>.967</td>
</tr>
<tr>
<td>Lagged Earning</td>
<td>1.00</td>
<td>.000</td>
</tr>
</tbody>
</table>

The value now depicts that there is low degree of impact of lagged book value of equity on earning available to equity shareholders of current year. Abnormal earning is positively related to one year lagged abnormal earning and book value of equity in a statistically significant manner. Hence the significant value is greater than .05. Whereas lagged earning makes significant difference on current year’s earning. Also the value of R shows perfect impact on current earning.

Table 3: Impact of Book Value & Earning on Market Price of Equity (Eq. 5)

<table>
<thead>
<tr>
<th>Predictors</th>
<th>R</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book Value</td>
<td>0.455</td>
<td>.000</td>
</tr>
<tr>
<td>Earning</td>
<td>0.482</td>
<td>.034</td>
</tr>
</tbody>
</table>

Both the independent variables i.e. book value of equity of current year & current year’s earning have moderate degree of impact on market price of equity. The significant value proves that both the independent variables are significantly different with the dependent variable.

Table 4: Impact of Book Value lagged, Lagged Earning & Lagged Cash flows on Current Earning (Eq. 6)

<table>
<thead>
<tr>
<th>Predictors</th>
<th>R</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book Value Lagged</td>
<td>0.304</td>
<td>.982</td>
</tr>
<tr>
<td>Earning lagged</td>
<td>1.000</td>
<td>.000</td>
</tr>
<tr>
<td>Cash Flow Lagged</td>
<td>1.000</td>
<td>.834</td>
</tr>
</tbody>
</table>

The significant value of lagged book value & lagged cash flow is greater than .05 so they are not able to show significant difference but lagged earning is the variable which shows significant difference on current earnings. But the effect of the lagged earning & lagged cash flow says that they make a high level of impact on current earnings. But book value of previous year has low degree of impact on current earnings available to equity shareholders before extra ordinary items.

Table 5: Impact of Book Value, Earning & Cash flows on Market Price (Eq. 7)

<table>
<thead>
<tr>
<th>Predictors</th>
<th>R</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book Value</td>
<td>0.455</td>
<td>.982</td>
</tr>
<tr>
<td>Earning</td>
<td>0.482</td>
<td>.048</td>
</tr>
<tr>
<td>Cash Flow</td>
<td>0.492</td>
<td>.136</td>
</tr>
</tbody>
</table>

Lastly the values of current year show moderate degree of impact on market price of shares. Current year of book value are not in significant level. R value hardly undergoes any improvement. Our empirical findings are consistent with Ohlson (1995) and Feltham, Ohlson (1995) models.

**Conclusion**

The role of book value and earnings in equity valuation is a well-researched topic. The findings suggest that abnormal earning is related to one year lagged abnormal earning and book value of the equity. The relation is statistically significant. Abnormal earning follows autoregressive process with respect to immediate previous period abnormal earning and book value of the equity. Similarly, operating cash flow also follows AR (1) process and is related to prior period operating cash flow and book value. Thus, abnormal earning and book value are sufficient in predicting market value and operating cash flow does not add to value relevance as per the findings of our study. Along with abnormal earning (which is a must for the model), besides book value of equity and cash flow, the behavior of other variables including qualitative variables may be considered as well in future research.
References


