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DETERMINANTS OF SHARE PRICES IN INDIAN AUTO INDUSTRY

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ABSTRACT

The paper attempts to investigate the value relevance of major corporate financial variables in the context of Indian Auto companies. Using a cross section of BSE Auto index listed firms over the 2001-2011 period, the study empirically determines the extent to which stock prices are supported by corporate policy issues (Dividend decision, Investment decision and Financing decision) in Indian stock market. The results of this study indicate that fundamental corporate financial variables play an important role in stock pricing in Indian Auto sector. The study provides support for the value relevance of dividend and investment policy suggesting that earnings distributed as dividends have a greater impact on firm value than does earning retained within the firm confirming the signaling effect of dividend policy. The study finds that dividend policy and investment policy are value relevant and helps provide a signal regarding the market information not contained in accounting publications. The study however fails to establish the value relevance of capital structure in Indian Auto sector.

Keywords: Share prices, corporate financial variables, value relevance, dividend policy, capital structure, investment decisions

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INTRODUCTION:

Background

The value relevance of financial statements have always been an area of central concern in academics given the need to understand the factors that explain pricing of tradable assets. The desire to understand the pricing/valuation of assets in absence of uniform set of factors/variables have led to plethora of theoretical based valuation models and frameworks attempting to link accounting information to firm/stock value. As a consequence, a number of empirical studies have been conducted, mostly in developed markets (US, UK) to explain this value relevance. Although different studies have linked various accounting variables to firm/stock value, the common findings have moved towards the belief that basic fundamental accounting variables (viz. earnings, book value, dividends, cash flow) approximate pricing of firm particularly well

The value relevance of published accounting information in the form of accounting earnings and the book value of assets has been a popular research topic in recent years with a large body of work emerging from the seminal works of Ohlson (1995,1999), and Feltham-Ohlson (1995, 1996), Strong et al. (1996), Rees (1997) and many others.

BASIS AND OBJECTIVE OF STUDY

The purpose of this study is to examine the value relevance of various corporate financial variables viz. dividend, debt and capital expenditure in Indian IT sector so as to provide further empirical evidence on accounting based value models (Ohlson, 1995, 1999, Feltham-Ohlson, 1995, 1996, Strong et al., 1996, Rees,1997 and many others). Stock pricing models which are based on the Ohlson framework, combines the dividend discount model with a clean surplus relation and values stock price as a function of book value of equity and the present value of future expected abnormal earnings. Arguing that a number of other key financial variables - notably capital structure, dividend policy and capital expenditures - are also indicators of value, the financial hypothesis are tested using the following extension of basic Ohlson model

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$$P_{it} = b_0 + b_1 DV_{it} + b_2 BV_{it} + b_3 RE_{it} + b_4 D_{it}/E_{it} + b_5 IV_{it} + \varepsilon_t$$

Where P_{it} is the price per share for firm i at year end t, BV_{it} is the book value of equity per share for firm i at year end t, DV_{it} is the ordinary dividend per share for firm i at year end t, RE_{it} is the retained earnings per share for firm i at year end t, D_{it}/E_{it} is the ratio of long term debt (secured and unsecured loans) to equity for firm i at year end t and IV_{it} is the investment (capital expenditure) per share for firm i at year end t.

LITERATURE REVIEW

Valuation Theories and Models

The relationship between accounting information and share price of a firm has been an area of extensive academic research and interest given that the general purpose of financial statements is to provide relevant financial information to investors.

Earlier research in this field concentrated only on earnings as the value driver of share prices, but with emergence of seminal work from Ohlson (1995) and Feltham-Ohlson (1997) book value of equity as an additional variable started to gain prominence with residual income framework becoming indicator of value creation.

Residual income (abnormal earnings) valuation model

The RIV (Residual income valuation) model, which has its genesis in DDM valuation model, shows that the intrinsic value of a firm can be expressed as original investment (original book value) plus the present value of infinite residual (abnormal) earnings beyond that investment. Mathematically

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$$V_t = BV_t + \sum_{i=1}^{\infty} \frac{E_t[x^a_{t+i}]}{(1+r)^i}$$

where V_t is the intrinsic value of common equity at time t, BV_t is the book value of common equity at time t, $E_t[x^a_t]$ is the expected future residual (abnormal) income in period t+i conditional on information available at time t, and r is the cost of equity, indicated as a constant

Ohlson (1995) defines residual income or abnormal earnings as:

$$x^a_t = x_t - (r_t * BV_{t-1})$$

where x^a_t is the residual income at time t, x_t denotes net income for the period ending at time t, r is the cost of equity, and BV is the book value of common equity at time t−1. The residual (abnormal) income is defined as the amount that net income exceeds the capital charge on the book value of equity.

The Ohlson (1995) model

The Ohlson model which builds on the abnormal earnings model is comprised of 3 basic assumptions. First, price is equal to the present value of expected dividends

$$V_t = \sum_{i=1}^{\infty} \frac{E_t[DIV_{t+i}]}{(1+r_{t+i})^i}$$

Second, the clean surplus accounting relation:

$$BV_t = BV_{t-1} + x_t - D_t$$

Combining the clean surplus assumption with the dividend discount model in yields:

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$$V_t = BV_t + \sum_{i=1}^{\infty} \frac{E_t[x^a_{t+i}]}{(1+r)^i}$$

Ohlson extended the above residual income model by introducing the third assumption of Linear information dynamic (LIM).

The linear information dynamic makes assumptions about the relationship between earnings of different periods and it is presented below:

$$x^a_{t+1} = \omega x^a_t + \upsilon_t + \varepsilon_{1,t+1}$$

$$\upsilon_{t+1} = \gamma \upsilon_t + \varepsilon_{1,t+2}$$

Where: x^a_t = abnormal earnings
ω = persistence term for abnormal earnings
υ = 'other information', and
γ = persistence term for 'other information'
ε = error term

The equations jointly describe current abnormal earnings as a function of the previous period abnormal earnings plus 'other information' and an error term. Both equations are autoregressive one processes, which in practice would be calculated across an extended time period

The assumption of the linear information dynamic together with the assumptions necessary to state the abnormal earnings model (PVED and clean surplus relation) allow the following closed-form value relation to be stated:

$$V_t = BV_t + \alpha_1 x^a_t + \alpha_2 v_t$$

Where: V_t = equity value of firm at time t
BV_t = book value at time t
x^a_t = abnormal earning at time t
v = 'other information' at time t

$\alpha_1 = \omega/ (1+R_f - \omega)$, and
$\alpha_2 = R/ (1+R_f-\omega). (1+R_f-\gamma)$

This formulation treats the value of shareholders' equity as the sum of three components: (i) current book value, (ii) capitalised current residual income, and (iii) capitalised value implied by other information. Conversely, the model implies that the market value is equal to the book value of the firm's assets, adjusted for abnormal earnings and other information that modifies the prediction of future profitability. The discount rate used in the Ohlson (1995) model thus far has been the risk free rate, and therefore based on risk neutrality.

Empirical Model and Hypothesis

Most empirical models based on Ohlson (1995) framework values stock price as a function of book value of equity and the present value of future expected abnormal earnings. This simplified basic expression, however, serves only as a first approximation as almost all empiricists generally extend the basic model to include other fundamental variables. Collins et al. (1997), Rees (1997), Amir and Lev (1996), Tiras et al. (1998), among others, have all extended the basic model to include other variables.

Arguing that a number of other key financial variables - notably capital structure, dividend policy and capital expenditures - are also indicators of value, the financial hypothesis are tested using the following extension of basic Ohlson model and incorporating the 3 corporate policy decisions (Dividend decision, Investment decision and Financing decision)

$$P_{it} = b_0 + b_1 DV_{it} + b_2 BV_{it} + b_3 RE_{it} + b_4 D_{it}/E_{it} + b_5 IV_{it} + \varepsilon_t$$

Where P_{it} is the price per share for firm i at year end t, BV_{it} is the book value of equity per share for firm i at year end t, DV_{it} is the ordinary dividend per share for firm i at year end t, RE_{it} is the retained earnings per share for firm i at year end t, D_{it}/E_{it} is the ratio of long term debt (secured and unsecured loans) to

equity for firm i at year end t and IV_{it} is the investment (capital expenditure) per share for firm i at year end t.

THE HYPOTHESIS

H1 – Value of a firm is a function of retained earnings and book value per share i.e. BV_{it} and RE_{it} and are positively and significantly related to P_{it}

H2 – Dividend policy relevance is examined because contrary to dividend irrelevance theory of Miller and Modigliani (1961), arguments for dividend as a signal of value have been made.The null hypothesis is value relevance of dividend is not greater than that of retained earnings: i.e $b_1 < b_3$.

H3 – Capital Structure relevance is examined because contrary to capital structure irrelevance theory of Miller and Modigliani (1958), arguments for debt as a signal of value have been made. The null hypothesis is that capital structure is not value relevant i.e. $b_4 = 0$.

H4 – Investment expenditure relevance is examined by testing the null hypothesis that investment expenditure is not value relevant i.e. $b_5 = 0$.

DATA AND SAMPLE

1. Source of Data

The underlying index of the empirical study is BSE (Bombay Stock Exchange) Auto index, which is based on free float market capitalization method. The BSE Auto index contains the 11 largest Auto stocks in Indian equity market which have a combined market cap of around 2.9 lakh crore. The index members have been taken as existing on 31st March 2011. To construct the data sample, the historical data is taken from Accord Fintech database. This database provides the data needed for the study

including earnings, book values, dividends, stock prices etc. The data used is all year end data including stock prices.

Summary of Sample firms

BSE Auto Index
Amtek Auto Ltd.
Apollo Tyres Ltd.
Ashok Leyland Ltd.
Bajaj Auto Ltd
Bharat Forge Ltd.
Cummins India Ltd.
Exide Industries Ltd.
Hero MotoCorp Ltd.
Mahindra & Mahindra Ltd.
Maruti Suzuki India Ltd.
Tata Motors Ltd.

2. Time Period of Study

The period of study is based on 11 year sample from 2001 to 2011. A year for the purpose of sample classification starts from April of the year concerned and ends in March of the following year. For example, the 2001 sample starts from April 1, 2000 and ends at March 31, 2001.

3. Selection Criteria

For a firm to qualify for inclusion in the sample, following criteria was laid down:

a) The firm must be a constituent of BSE-Auto index

b) The firm must have (at the end of the fiscal year) all required data including, but not limited to price, earnings, book values, dividends, debt and capital investment in the Accord Fintech database. Cases with missing data were eliminated.

DATA ANALYSIS AND RESULTS

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A) Descriptive Statistics: The descriptive statistics of the variables used in the study are given in table 1 below:

Table 1: Descriptive Statistics

Variables –per share	Mean	Standard Deviation	Minimum	Maximum
P	395.43	416.52	18.10	2,011.10
DPS	8.55	15.35	0.00	110.00
BV	110.38	84.02	8.37	479.84
RE	15.55	17.22	-19.56	80.42
IV	19.19	24.08	0.00	114.43
Debt	63.50	62.87	0.03	290.85
EPS	24.10	24.73	-19.56	117.75

B) Correlation Statistics: The correlation matrix (Table 2) reveals the correlation between the variables used. The correlation statistics are generally quite high with earnings, dividends and book value being highly and positively correlated with price per share whereas debt showing low correlation with price.

Table 2: Correlation between explanatory variables

	Price	*EPS*	*DPS*	*BV*	*Debt*	*IV*	*RE*
Price	1						
EPS	0.92	1					
DPS	0.71	0.73	1				
BV	0.63	0.63	0.21	1			
Debt	0.02	-0.01	-0.04	0.42	1		
IV	0.20	0.27	-0.02	0.67	0.52	1	
RE	0.70	0.79	0.15	0.71	0.01	0.41	1

C) Results of the Valuation model: The results of the above stated hypothesis are given in below table 3. The table incorporates the results of the basic model, the full model and partial version of full model. The full and partial models are discussed in the following paragraphs. It is argued that the partial versions of the full model would help in determining the sensitivity of results to alternative specifications.

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The basic model shows that the slope coefficients of book value (0.68) and retained earnings (12.2) are positively and statistically significant thereby showing value relevance of basic financial variables in Indian Auto industry.

With regards to the second hypothesis of dividend relevance, the results show that both the dividends (16.3) and retained earnings (12.2) coefficients are significantly different from zero, with the dividend coefficient being greater than the retained earnings coefficient. Thus the null hypothesis that dividend coefficient is equal to the retained earnings coefficient is rejected at 5% level of significance. The results of the study shows that level of dividends play an important role in determination of stock prices in case of Indian auto companies and are viewed as credible way of signal by management regarding their long term financial health and prospects. Also given the semi strong efficiency of Indian market and information asymmetry, dividends are an important signal with regards to management private information.

The intervening column in the table (Dividend & Debt) shows no evidence regarding the third hypothesis of debt as a signal of value. The coefficient of debt to equity ratio (-4.9) has been found to be statistically insignificant and thus provide no support for the hypothesis that capital structure is value relevant.

The fourth hypothesis where value relevance of investment policy is tested shows that the capital investment variable is negatively associated with price and its coefficient (-2.88) is significantly different from zero thereby providing relevance for investment decisions.

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Table 3: Tests of the signaling models: Pooled data models

	Basic	Dividend & Debt	Full
Intercept	**-10.6**	**-6.67**	**-14.88**
t-stat	-0.43	-0.22	-0.51
p value	*0.668*	*0.828*	*0.613*
DPS	**16.36**	**16.33**	**15.6**
t-stat	16.61***	16.34***	16.07***
p value	*0.000*	*0.000*	*0.000*
BV	**0.68**	**0.68**	**1.32**
t-stat	2.7***	2.7***	4.4***
p value	*0.008*	*0.008*	*0.000*
RE	**12.28**	**12.22**	**11.81**
t-stat	10.09***	9.79***	9.93***
p value	*0.000*	*0.000*	*0.000*
D/E	**-**	**-4.91**	**2.42**
t-stat		-0.22	0.11
p value		*0.828*	*0.911*
IV	**-**	**-**	**-2.87**
t-stat			-3.54***
p value			*0.001*
R-Sq	86.7%	86.7%	88.1%
R-Sq(adj)	86.3%	86.2%	87.5%

*** means significant at 5% level

CONCLUSION

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The use of fundamental variables to explain stock price behavior has been an important area of research globally. While there has been an extensive research on fundamental based valuation models in developed countries like US, UK, Canada there has been dearth of empirical evidence in emerging markets particularly India. To fill this gap, this study attempts to determine the extent to which various fundamental corporate policy variables viz. dividend, debt, capital expenditure helps explain stock prices in Indian Auto companies. The study finds that dividend policy and investment policy are value relevant and helps provide a signal regarding the market information not contained in accounting publications. The study however fails to establish the value relevance of capital structure in Indian Auto sector.

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