

A STUDY ON DETERMINANTS OF EQUITY SHARE PRICES OF COMPANIES LISTED IN BSE SENSEX

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Abstract: Purpose – The purpose of this paper is to identify various determinants of prices of equity shares that are listed in BSE Sensex annual time series data for a period of 1999-2014. **Design/methodology/approach** – Based on the review of literature, certain variables were identified and factor analysis is undertaken to identify the underlying factors. In this process, two factors namely return on Equity and Dividend Pay-out Ratio were identified and multi collinearity, Autocorrelation, normality Heteroscedasticity were applied to conform the results of multiple regression by analysing the impact of two identified factors on the equities. **Findings** – The study has found that there are broadly two factors Return on Equity (ROE) and Dividend Pay-out ratio (DPR) that determine the market price of a share depending on the selected explanatory variables undertaken during the study. It is found that dividend pay-out is significantly negative with a $\hat{\alpha}$ value of -0.189 at 100% level of significance which implies that low dividend pay-out increases the market price and viceversa in the light of growth opportunities and return on equity has a Significantly positive effect with a $\hat{\alpha}$ value of 0.308 at 100% level of significance on market price with an increase in profits of the firm. **Originality** – The main contribution of the study is that dividend pay-out ratio is one of the important variable to be considered in the light of growth opportunities before making investment by the investors and return on equity is to be considered when investors look at the book values for making investment.

Keywords: Capital Market, Investment Decisions, Time series, Stock Price

JEL Classification: G10, G110, C580, G120.

INTRODUCTION

Savings promotes capital formation and economic growth through increase in output and incomes of the country. Savings for capital formation is mobilized through the capital market comprising the new issues and the stock market. The instruments raised by the companies in the form of Equity shares, debentures, preference shares etc. are

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traded on stock exchange to ensure liquidity. The shares are traded at market price in the stock exchange. The behaviour of a market price of a share depends on the players, environment and various factors. An analysis of how the prices behave or react to different types of information available in the market forms the key basis for share price behaviour.

In Finance different schools of thought explain the behaviour of market price of a share. Efficient Market hypothesis developed by (Fama. E. F, 1970) states that share prices already incorporate and reflect all relevant information available in the market and all the share prices will be in equilibrium. But it has been criticized by the behavioural finance on the grounds that though the market discounts all the information available, but still there will be certain information which will help the investor to make analysis and generate the higher returns. Such information creates the disequilibrium in the market and makes the investor to book profits. Fundamental analysis helps the investor to analyse the present value of the firm at the stage of disequilibrium in the market by making an analysis of economy, industry and company related factors which determine the fluctuations in the share prices and indirectly the wealth of shareholders. A discount factor is one which equates the future value of an asset to its present value of investment where the asset is said to be as fairly priced. All assets need not be fairly priced, some may be under-priced and some assets may be overpriced. Assets are considered as under-priced when the discounted future value of an asset value is more than the present value of investment on an asset. It is also said to be as overpriced where the discounted future value of an asset value is less than the present value of investment on an asset. An investor making an investment by seeking higher risk has to go through all such factors which influence the price of a share in order to generate higher return.

BOMBAY STOCK EXCHANGE

BSE established in 1875 is the Asia's first and oldest Stock Exchange in the world which provides an efficient and transparent market for trading in equity, debt instruments, derivatives and mutual funds of small-and-medium enterprises (SME) of more than 5000 listed companies having a total market capitalization of USD 1.32 Trillion as of January 2013. BSE's popular equity index - the S&P BSE SENSEX - is India's most widely tracked stock market benchmark index was first compiled in 1986 calculated on a "Market Capitalization-Weighted" methodology of 30 component stocks with a base year of 1978-79 representing large, well-established and financially sound companies across key sectors. BSE Sensex is an index where equity shares of blue chip companies having higher frequency of trading are traded by the risk seekers for higher return at higher risk.

REVIEW OF LITERATURE

Financial statement analysis is seen as a part of the fundamental analysis required for equity valuation. The analysis of current financial statements helps in identifying

current ratios as predictors of the future ratios that determine the equity payoffs (H. Penman, 2001). Ratios derived from financial statements serve as one of the most important components for predicting future stock returns. A Thorough examination of financial reports can help the investor to identify such factors for making a better investment decision and to create a better portfolio.

In India, the first study on Determinants of equity share prices is done by (Desai, 1965) continued by (Srivastava, 1968); (Sarkar, 1971); (Chawla D., 1987) and Srivastava (1984) studied the relationship dividend per share, Earnings per share and retained earnings on the market price per share and found that Dividend per share is one of the most important factor influencing the market price per share. Followed by (Kumar, 1975) stated that the influence of dividend per share and retained earnings on the market price varied depending on the nature of the industry.

(Chandra P., 1978) Studied the impact of growth, Dividend, Leverage, Size and risk on the market prices of shares. By using linear regression, it is concluded that growth and size showed a positive relationship while risk and leverage does not influence the market process of shares. (Bhole, 1980) in his work revealed that earnings explained the movements of share prices rather than dividends. (Zahir M. K., 1982) examined that yield is negatively related to market price while book Value is positively influenced by market price of a share. (Krishnan, 1984); (Sharma R. K., 1989); (Purank, 1992); (Zahir M., 1992) studied the empirical relationship between equity price of shares and Dividend Per Share, Earnings per share, Book Value per share yield and Cover and found that Dividend Per Share and Book Value per share are significant whereas Dividend Yield and Cover are insignificant.

(Dixit, 1986) Studied 43 sample companies equity share price behaviour and found that Divided Per share, Earnings per Share, Book value per share, Size and return on investment is significant while leverage and Growth are insignificant. (Mahapatra R.P., 1993) analysed a model to explain the behaviour of shares with respect to dividend and yield which is found to be significant whereas Size, Return on Investment, Earnings per share and Book Value is found to be insignificant.

(Obaidullah M., 1991) Concluded that low price earnings ratio stocks is outperformed when compared to high performed stocks Vaidyanathan & Gouswami in 1997 identified that price earnings ratio is not an important factor in determining the investment decisions in Indian Capital Market.. Followed by (Mahapatra, 2004) identified that dividend yield is negatively significant while Book value per share, return on Investment and Leverage is not significant.

(Sharma S., 2011) in his study examined the relationship between equity share prices and explanatory variables like Book value per share, Dividend per share, Earnings per share, Price earnings ratio, Dividend yield and pay out during the period 1993-1994 to 2008-2009. He has taken a sample of 6 industries and studied the relationship with the help of correlation and regression analysis and found out that Dividend per share, Earnings per share and book value per share showed a positive

correlation with market price throughout all the years of the study. (Shobhana, 2011) Studied the influence of fundamental variables on equity prices of 'A' Group and 'B' Group shares of the banking companies listed at BSE. Correlation and multiple regression analysis findings reveal that market capitalization and dividend yield have significant influence on the equity prices of 'A' group shares and in the case of group 'B' shares book value per share emerged significant.

(Shukla & Jeenal, 2011) tried to analyse the interrelationship between equity share prices and dividend per share, Earnings per share, Price earnings, Dividend yield and Dividend Cover among the sample companies during 2005-2009 and concluded that all the selected explanatory variables showed a significant influence on the equity share prices except growth variable.

(Singhania, 2006); (Nirmala, 2011) tried to identify the determinants of share prices in the Indian Market during the period of 2000-2009. They have taken a sample of three sectors namely Auto, Healthcare and Public Sector Undertakings. By using unit root tests and co-integration, he found that variables like Dividend per share, price earnings ratio and leverage are significant determinants of share prices for all the sectors taken in the study.

(SerifeOzlen, 2012) tried to study the impact of internal determinants on stock price movements on sector basis by taking a sample of eight companies belonging to 2 sectors. By using Least squares method, they found that the results of price earnings ratio have significant positive coefficients for Industrial and service sectors.

(Dawar, 2012) studied how the fundamental corporate financial variables play an important role in stock pricing in Indian Auto sector by cross section of BSE Auto index listed firms over the 2001-2011 period, and found out 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.

(Srinivasan, 2012) examined the fundamental determinants of share price in India. The study employed panel data consisting of annual time series data over the period 2006-2011 and cross-section data pertaining to 6 major sectors of the Indian economy, namely, Heavy and Manufacturing, Pharmaceutical, Energy, IT and ITES, Infrastructure, and Banking. The panel data techniques, viz. Fixed Effects model and Random Effects model have been employed to investigate the objective. The empirical results revealed that the dividend per share has a negative and significant impact on the share price of manufacturing, pharmaceutical, energy, and infrastructure sectors. Earnings per share and price-earnings ratio are being the crucial determinants of share prices of manufacturing, pharmaceutical sector, energy, infrastructure, and commercial banking sectors. Size is being a significant factor in determining the share prices of all sectors under consideration except manufacturing. Moreover, the book value per share positively influences the share prices of pharmaceutical, energy, IT & ITES, and Infrastructure.

(Tandon, 2013) studied the relationship between firm specific factors such as dividend, book value, earnings on stock prices of National Stock Exchange (NSE) 100 companies and the results indicate that firms' book value, earning per share and price-earnings ratio are having a significant positive association with firm's stock price while dividend yield is having a significant inverse association with the market price of the firm's stock.

(Almumani, 2014) studied the influence of Dividend Per share, Earnings Per share, Book value and Price earnings ratio on the market price per share of listed banks in Amman Stock Exchange for a period of 2005-2011 and analysed that Earnings Per Share, Book Value, Price earnings, Dividend Per Share and Dividend Pay-out ratio has a positive and significant relationship with the market price whereas Size is negatively related with the market price of a share.

(Murthy, 1994) studies the relationship between macroeconomic factors and market price of shares and found out that there is a negative relationship between inflation and interest rate. (Sen., 1996) examined the impact of GDP growth, changes in interest rates, changes in exchange rates, flow of foreign capital on share prices in the market and found that there is a significant relationship between stock prices and foreign capital flows. Rao and Jose also tried to examine the effect of small savings of government current and non-current account and Index of industrial Production, Wholesale Price Index, Foreign exchange reserves, deposits with banks, interbank call money rate and found significant relationship with the market price.

Naka. A., Mukherjee, T & Tufte, D (1998). Macroeconomic variables and performance of Indian stock market. Department of Economics and Finance Working papers, University of New Orleans.

Naka and Mukherjee, and Tufte (1998) tries to study the impact of domestic inflation, output growth, Industrial production on the market price of a share and found that inflation is negatively related to stock prices, industrial production is positively related to stock prices and output growth has been a predominant driving force.

(Pethe, 2000) Studied the impact of exchange rate, money supply, Index of Industrial Production on Sensex and Nifty and found that Sensex and Nifty is affected by Index of Industrial Production only.

(R c., 2001) Examined the relationship between FII and stock market returns. The impact of FII proved to be significantly positive towards the stock returns only during the period of Pre Asian crisis.

(B, 2007) investigated the impact of foreign exchange reserves, claims on private sector, Wholesale Price Index, call money rate, Index of Industrial Production, exchange rate and broad money on Sensex during the period of April 1986 to March 2005. He

found that only interest rate and Wholesale Price Index showed less influence and all other variable exhibited significant influence on the Sensex.

(L.R Nair, 2008) Nair (2008) studied the impact of interest rate, real income and its growth on Indian stock market and found that interest rate has a negative influence where as Foreign Institutional investment, exchange rate and inflation has no impact on the stock Market.

(R.P. K., 2011) analysed the long term relationship between Indian capital market and macro factors like interest rates, inflation rate, Exchange rate and gross Domestic savings. The results showed that there is long term relationship between these variables and the market indices Sensex and Nifty during the period 1995 to 1998 and also found that that inflation had a significant impact on both the Sensex and Nifty.

(Karla, 2012) examined the impact of macro-economic variables such as forex rate, CRR, reverse Repo rate, gold prices, wholesale price index, oil rate, inflation rate and GDP on Indian stock market .and found out that there is appositive association forex rate, inflation rate and gold prices on the movement of Sensex. Followed by (Singh, 2012) observed the influence of exchange rate, interest rate, index of industrial production and Foreign Institutional investment which is proved to be significantly positive on Sensex and the same test is carried by Trivedi and Behera's including Morgan Stanley's International Index (MSCI) along with all the above variables and found to be significant with BSE Sensex.

RESEARCH METHODOLOGY

Sources of Data Collection: Sources of data deals with the methods and instruments used in the process of gathering of data required to carry on research activities. In the present study, secondary data is collected from various sources for review of literature from Journals, Magazines, Academic text books, Newspapers and Databases like EBSCO, SAGE, SPRINGLER, EMERALD INSIGHT, JSTOR etc. Information on company's performance from CMIE Databases like PROWESS, CAPITAL LINE ECONOMIC OUTLOOK. Etc. Data on Indian Economy has been obtained from WORLDBANK DATA, IMF and RBI.

Statistical tools and Techniques

Factor Analysis is one of the data reduction techniques which is helpful in reduction of number of variables. Factor analysis reduces the n number of variables in to a set of factors depending on the strength of correlation between the variables in the study. Multiple Regression is a technique of analysing the impact of one or more independent variables on one dependent variable. Multiple Regression results will be accurate on absence of multicollinearity and when the data is normally distributed.

RESEARCH VARIABLES

Table 1
Independent and Dependent Variables

<i>Variable</i>	<i>Type of Variable</i>	<i>Symbol used</i>	<i>Theory</i>	<i>Formula</i>	<i>Hypothesised relation with share price</i>
Market Price of a share	Dependent	MP	Average Share Price	(Opening + Closing)/2	-
Return on Equity	Independent	ROE	DuPont Analysis	$\frac{\text{Earnings Per Share}}{\text{Book value Per Share}}$	Positive
Dividend	Independent	DPR	Gordon Dividend	$P = \frac{E(1-b)}{r - (k * b)}$	Negative
Pay-out ratio			Discount Theory		

(Source: Theoretical Framework)

MODEL SPECIFICATION

The present study specifies the model to be tested by using multiple regression

$$MP = a + \beta_1 \log (ROE) + \beta_2 \log (DPR)$$

Where,

MP= Market Price of an Equity Share

$\beta_1, \beta_2, \beta_3$ = slope of the Regression equation

a = Consonant

RESEARCH HYPOTHESIS

The present study seeks to test the following which have been based on the literature undertaken to identify the factors influencing stock prices in different stock markets.

1. There is a positive relationship between Return on equity and Market price of a Share.

The theory on return on equity can be traced in the model DuPont analysis which decomposes a firm’s return on equity in to three ratios of Profit Margin, Asset Turnover and Leverage. Return on equity derived from the financial statements is positively related to Market price of a share. (Mark. T. Soliman, 2008).

$$ROE = \left[\frac{NI}{Sales} * \frac{Sales}{Assets} * \frac{Assets}{Equity} \right] \tag{1}$$

2. There is a negative relationship between Dividend Pay-out and Market Price of a Share.

Dividend pay-out shows the percentage share of the net profits after taxes and preference dividend paid out as dividend to equity shareholders. Linter (1956) linked dividend changes to earning while Shapiro valuation model (1962) showed dividend streams discounted by the difference in discount rate and growth in dividend should be equal to share price. This predicts direct relation between pay-out ratio and the price- earnings multiple. Conversely it means that there is an inverse relation between pay-out ratio and share price changes.

$$\text{Divident Payout} = \frac{\text{Dividend Per Share}}{\text{Earnings Per Share}} * 100 \quad (2)$$

EMPIRICAL ANALYSIS

Factor Analysis: In present study, Kaiser-Meyer-Oilskin (KMO) Measure is 0.731 which indicates that the sample is adequate for factor analysis and it is also evident that Bartlett's test of Sphericity is highly significant at 5% level of significance. Rotated Component matrix shows the reduction in number of factors on which variables under the study have high loadings. Basing on Review of the theoretical framework, the variables loaded in the first factor represents the book values of the firm and named as Return on equity and the variables loaded in the second factor represents the dividend pay-out ratio

Table 2
Factor Analysis: Rotated Component Matrix

	<i>Component</i>	
	1	2
Book value	.981	
Earnings per share	.980	-.108
Inflation	.971	
GDP	.967	.128
Market Capitalisation	.948	.135
Beta	.906	.302
Net Profit Margin	.741	.319
Exchange rate	.696	-.519
Foreign Institutional Investors	.563	.125
Price to book	.129	.927
Price earnings	.367	.821
Dividend Yield	-.583	-.729
Bank Rate	.372	-.695

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

(Source: Author)

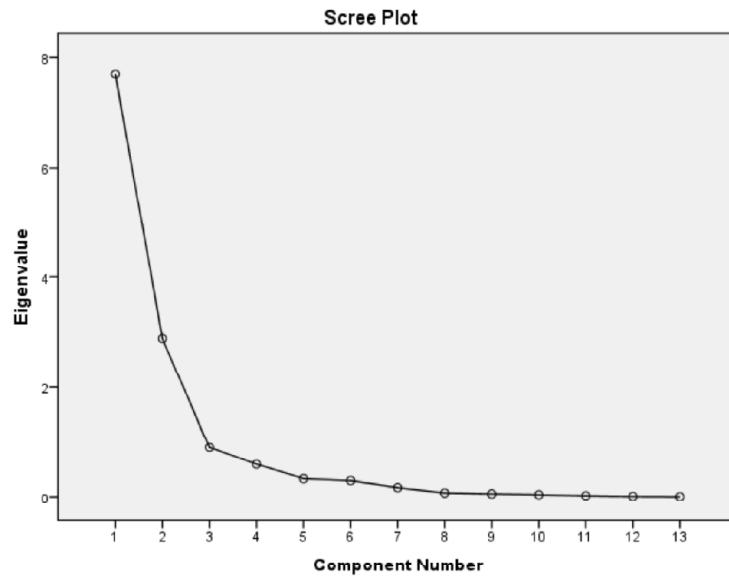


Figure No: 5.1.1: Screen Plot

Normality of the Data

In order to perform regression analysis, the data must be normally distributed which one of the important assumption of parametric test. Skew ness shows a value of 1.22 which indicates that it is moderately skewed and the value of kurtosis is 0.99 which is

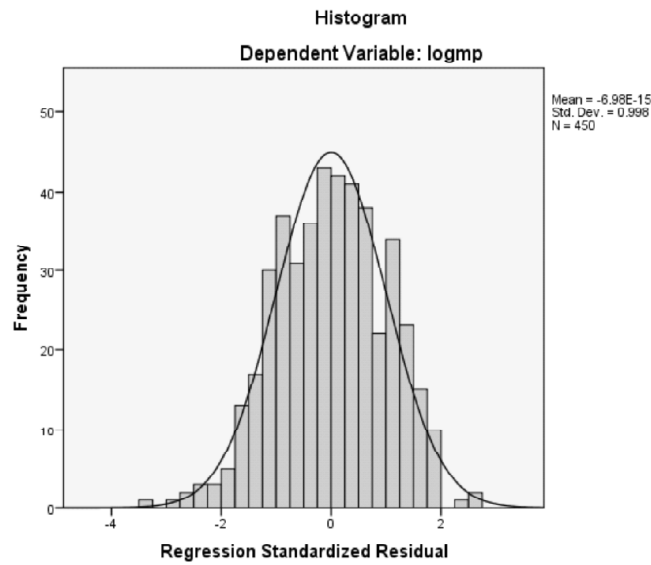


Figure No: 1: Normality – Regression Residuals

less than the value of normal distribution and it is termed as Platykurtic distribution. Shapiro Wilk's Test is one which is used to check the principle of normality which indicates that test is insignificant which implies null hypothesis is accepted which means that data is normally distributed.

Durbin-Watson statistic is a test statistic used to detect the presence of autocorrelation in the residuals (prediction errors) from a regression analysis which is 0.598 which is less than 3 of the tabulated value at 5% level of Significance which indicates that there is no autocorrelation.

Multiple Regression Analysis

Multiple regression analysis tries to study the impact of return on equity and dividend pay-out ratio on market price of a share.

Table 3
Model Summary of Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.352 ^a	.124	.120	.41526	.124	31.583	2	447	.000	.598

a. Predictors: (Constant), LOGDPR, LOGROE

b. Dependent Variable: LOGMP

(Source: Author)

The data is plotted on the scatter plot and the trend appears to be a Nonlinear and various methods like Linear, Logarithmic, Exponential, Power, and Polynomial were applied and the R square value is higher only in case of log linear model so the model is fitted in to the data. The above table represents an R Square of 12.4% which indicates that any change in the return on equity and divided pay-out ratio is will have an impact of 12.5% change in the market price of a share.

Table 4
Correlations

		LOGMP	LOGROE	LOGDPR
LOGMP	Pearson Correlation	1	.297**	-.172**
	Sig. (2-tailed)		.000	.000
	N	450	450	450
LOGROE	Pearson Correlation	.297**	1	0.056
	Sig. (2-tailed)	.000		0.235
	N	450	450	450
LOGDPR	Pearson Correlation	-.172**	0.056	1
	Sig. (2-tailed)	.000	0.235	
	N	450	450	450

** . Correlation is significant at the 0.01 level (2-tailed).

(Source: Author)

In the below graph it is clear that return on equity and dividend pay-out is significantly positive at 1% level of significance. The Correlation between return on equity and dividend pay-out is 0.056 which is highly insignificant and ensures that there is no multicollinearity between independent variables.

Table 5
ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.892	2	5.446	31.583	.000 ^b
	Residual	77.081	447	.172		
	Total	87.973	449			

a. Dependent Variable: LOGMP

b. Predictors: (Constant), LOGDPR, LOGROE

(Source: Author)

From the F test with a value of 31.583 where $p < 0.05$ indicates that it is significant and states that market price of a share is jointly affected return on Equity and Dividend Pay-out ratio.

Table 6
Regression Beta Coefficients

Model		Unstandardized		Standardized		Sig.	Collinearity	
		Coefficients		Coefficients			Statistics	
		B	Std. Error	Beta	t		Tolerance	VIF
1	(Constant)	2.825	.056		50.300	.000		
	LOGROE	.401	.058	.308	6.940	.000	.997	1.003
	LOGDPR	-.300	.070	-.189	-4.257	.000	.997	1.003

a. Dependent Variable: LOGMP

(Source: Author)

From the above table it is evident that Dividend Pay-out have a negative impact on the market price of share at a 100% level of significance hence H_0 is rejected which means that dividend pay-out ratio has a negative impact on the market price of a share. Return on Equity shows a positive significant relation with market price at 100% level of Significance and hence H_0 is rejected which implies that return on equity has a positive impact on market price of a share.

RESULTS AND DISCUSSIONS

- (a) Dividend Pay-out have a negative impact on the market price of share which implies that when the company declares low dividend pay-out, investors will start buying the share with an intention that the company has more investment opportunities in the future and so the company decides to pay less and retain more and expects that the company will pay a higher rate of return on its reinvestment for next year which makes the market price of a share to increase

and when it declares high dividend pay-out, investors start selling the shares with an intention at the company has no further opportunities for investment in the future and it cannot generate a higher rate of return. This theory of negative relationship between dividend pay-out and Market price in the light of investment opportunities is found consistent with the findings of (Gordon, 1959) and (Walter, 1963) which is also supported by (Rozeff M. , 1982) , (Easterbrook, 1984), (Jensen, 1986)and (Gul, 1999).

- (b) Return on equity have positive significant relation with market price implies that higher sales leads to higher profits and increase the optimum utilisation of assets and thus ensures efficiency in operations and makes the market price of a share to increase. Return on Equity (ROE) which showed a positive relationship with the market price of a share at 10% level of significance is found consistent with the findings of (T.Soliman, 2008) (Khan, 2009) (Ahmed, 2012) (Masum, 2014) (Nimalathasan, 2014) (Mushure, 2014)
- (c) The equation of the regression line is

$$MP = 2.825 - (0.189) DPR + 0.308(ROE)$$

- (d) The beta value of the Dividend pay-out ratio (DPR) indicates that if there is a decrease of 1% of DPR then there will be increase of 18.9% in the market price of a share. This sign and beta value is also found to be consistent with the studies indicated that dividend pay-out in light of growth opportunities generate negative sign with the market price of a share and found that beta values lie in the range of 0.002 to 0.726.
- (e) The beta value of the Return on Equity (ROE) indicates that if there is an increase of 1% of ROE then there will be increase in 0.308 in the market price of a share. This sign and beta value is also found to be consistent with the studies indicated that return on equity generate positive sign with the market price of a share and found that beta values lie in the range of 0.012 to 0.310.

CONCLUSION

The present concludes that dividend pay-out ratio is one of the important variable to be considered in the light of growth opportunities before making investment by the investors and return on equity is to be considered when investors look at the book values for making investment.

LIMITATIONS OF THE STUDY

Following are the limitations of the study:

1. The study is limited only to 30 companies of Sensex.
2. The study period is limited to only to 15 years depending upon the availability of data.

3. The results of the study cannot be generalised.
4. The value of R Square is low but have statistically significant predictors where one can still draw important conclusions about how changes in the predictor values are associated with changes in the response value. Even a small R square can signal economically significant predictability. A theoretical Sound model with lower r squared will still win out.

SCOPE OF FURTHER RESEARCH

The present research covers only the companies listed on BSE Sensex but further research on same variables may be applied to different indices covering a variety of companies relating to different sectors.

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