An analysis of Stock Market Index Prediction using Valuation Ratios and Market Capitalization

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ABSTRACT

The study hypothesizes that PB Ratio along with Market Size has no significant impact on Market Index i.e. Bombay Stock Exchange benchmark Index, (SENSEX) that PE Ratio along with Market Size has no significant impact on Market Index and that PB Ratio, PE Ratio along with Market Size has no significant impact on Market Index. The data is collected for 19 years from 2000 to 2019 from RBI (India) and BSE benchmark SENSEX Index and three econometric models are constructed separately to find the interactions of PB Ratio, PE Ratio and Market Capitalization on Market Index Values. Our econometric models are strong and robust findings suggest that PB ratio and PE ratio impact the index negatively, whereas market capitalization impacts index very strongly and in positive direction.

Keywords : SENSEX, PB Ratio, PE Ratio, Market Capitalization

I. INTRODUCTION

The primary aim of financial reports is to offer insight on the financial situation and results of businesses. Users of this information look closely for the numbers reported in financial statements and have long been considered those numbers as a reference for their decisions. To assess and predict the productivity, stock growth, cash flow and dividends of the economic and eventual actions of companies, the consumers of accounting information rely heavily on data arising from financial statements or their components. Financial reporting figures may impact investor trust in the financial markets. Investor are searching for opportunities to invest additional money in the most productive capital markets and is one of the key reasons why each investor needs to pay special attention to stock prices.

Financial ratios are considered to be the oldest and simplest functional methods in evaluating and preparing the success of businesses. They emerged in the mid nineteenth century, and the accountants and financial experts still use them. Consumers of information have used financial ratios to make their economic choices; including expenditure decisions and management decisions along with whether to invest or otherwise.

A great deal of labour has been put into understanding stock returns' cross-sectional behaviour. The work of Fama and French (1992) is basically is based on price to book (PBR) and price to earnings (PER) ratios and cross-sectional returns on

the US domestic market. Ferson and Harvey (1997) also report similar relationships (that of PBR and PER with stock returns) for established foreign markets, and also for sample emerging stock markets. Claessens, Dasgupta, and Glen (1998) also find that PBR and PER are substantially associated with stock returns for number of emerging markets. More recently, during a data panel of 19 emerging stock markets, Aydogan and Gursoy (2000) report significant relationships between PBR and PER and stock returns.

The motivations for this paper laze in the pursuit for predictability of stock index in an emerging economy. The brief literature mentioned above suggests that PB ratio, PE Ratio and Market Capitalisation have been significant in predicting stock returns . Thus we investigate how PB and PE ratios, alongside market capitalisation can predict stock market index in Indian markets. The empirical documentation provides some insight into whether these markets have evolved to the extent that the elemental factors associated with equity return performance in additional established emerging stock markets also are operational in these newer markets. To those engaged in investment decisions within the world, such facts are going to be of practical use.

The main contribution of this paper is the prediction of stock index at an emerging market (India for this context) using indicators such as PB Ratio and PE Ratio along with market capitalization. The research illustrates how market capitalization, PB ratio market, and PE ratio market work with each other and independently to affect the Market Index. The findings reinforce the idea that the stock level is greatly influenced by market capitalisation. Our equations also articulate that PB Ratio and PE Ratio have a negative rather than positive impact on stocks. Review of Literature

Various studies have reported a connection among returns and in this way the relative book-to-showcase value esteems (BM) and income to-value

proportions (EP) of firms. Basu (1977, 1981), for example, discovers proof that normal returns are higher for low cost to-income proportions after alteration for assessed betas. Rosenberg, Reid, and Lanstein (1985) report a positive connection between normal returns and book-to-advertise value esteem proportions, and Lakonishok, Shleifer, and Vishny (1994) give evidence that normal returns are decidedly connected with book-to-market and profit to-value proportions.

Chan, Hamao, and Lakonishok (1991) additionally give proof that the market-to-book proportion might be a critical consider clarifying normal returns in Japan, while Capaul, Rowley, and Sharpe (1993) give comparable worldwide discoveries to a more extensive arrangement of created securities exchanges. the principal conspicuous ongoing include this territory is by Fama and French (1992), who record a major connection between book-to-market and profit to-value proportions and cross-sectional returns inside the local U.S. showcase.

Comparable discoveries are accounted for by Fama and French (1998) for progressively created universal markets, additionally as clearly rising securities exchanges. All the more explicitly, Fama and French (1998) archive higher yearly returns for 12 of 13 created global markets (counting the U.S. showcase) for higher BM and EP portfolios over the 1975-1995 period. Yearly returns likewise are accounted for to be higher for higher BM proportions in 12 of 16 developing markets and better for higher EP proportions in 10 of the 16 nations.

Claessens, Dasgupta, and Glen (1998) find that PER proportions are emphatically connected with month to month stock returns in 14 of the 19 developing markets that they look at, while their discoveries propose a positive connection between PBR proportions and month to month stock returns in 9 of the 19 markets. They really utilize the converse of the PBR proportion or the market-to-book proportion,

and locate a negative connection among returns and hence the PBR proportion in nine markets.

II. Research Methodology Data

The data is collected from Reserve Bank of India and Bombay Stock Exchange's benchmark Sensex Index. The Annual Data for Index closure in the month of March every year from 2000 to 2019 is considered for data analysis. Similarly, the Market Capitalization, PB Ratio and PE Ratio of the exchange for 19 years (2000 to 2019) are collected from Reserve Bank of India.

Hypotheses

H0:1 – PB Ratio along with Market Size has no significant impact on Market Index.

H0:2 – PE Ratio along with Market Size has no significant impact on Market Index.

H0:3– PB Ratio, PE Ratio along with Market Size has no significant impact on Market Index.

Regression Model

Model 1 - Index = α + $\beta1$ PB ratio + $\beta2$ Market Capitalization + $\mu1$ (1)

Model 2 -Index = α + $\gamma1$ PE Ratio + $\gamma2$ Market Capitalization + $\mu2$ (2)

Model 3 -Index = α + $\delta1$ PB ratio + $\delta2$ PE Ratio + $\delta3$ Market Capitalization + $\mu3$ (3)

Index – BSE's Sensex Closing Prices

Results, Analysis and Findings Model 01-

Table 01, show the regression results along with Durbin-Watson values for Model-01. The model is based on econometric model as in equation no. 01. The only significant determinant of market index in Model 01 is Market Capitalization. The Durbin-Watson value is 2.68 which determine a robust model. The value of R-squared is 0.89 which is again robust.

Table01- Model 01

lnmarketindex	Coef.	St.Err.	t-value	p-value	(95% Conf	Interval)	Sig
PBRatio	-0.084	0.073	-1.15	0.267	-0.240	0.072	
lnmarketcap	0.651	0.060	10.82	0.000	0.523	0.779	***
Constant	0.026	0.912	0.03	0.978	-1.918	1.969	
Durbin-Watson d-statistic(3, 18) = 2.673521							
Mean dependent var		9.704	SD dependent var			0.683	
R-squared		0.887	Number of obs			18.000	
F-test		58.852	Prob> F			0.000	
Akaike crit. (AIC)		3.095	Bayesian crit. (BIC)			5.766	

*** p<0.01, ** p<0.05, * p<0.1
Lnmarketind

Figure 1: Regression Curve Fitting for Independent Variables for Model 01
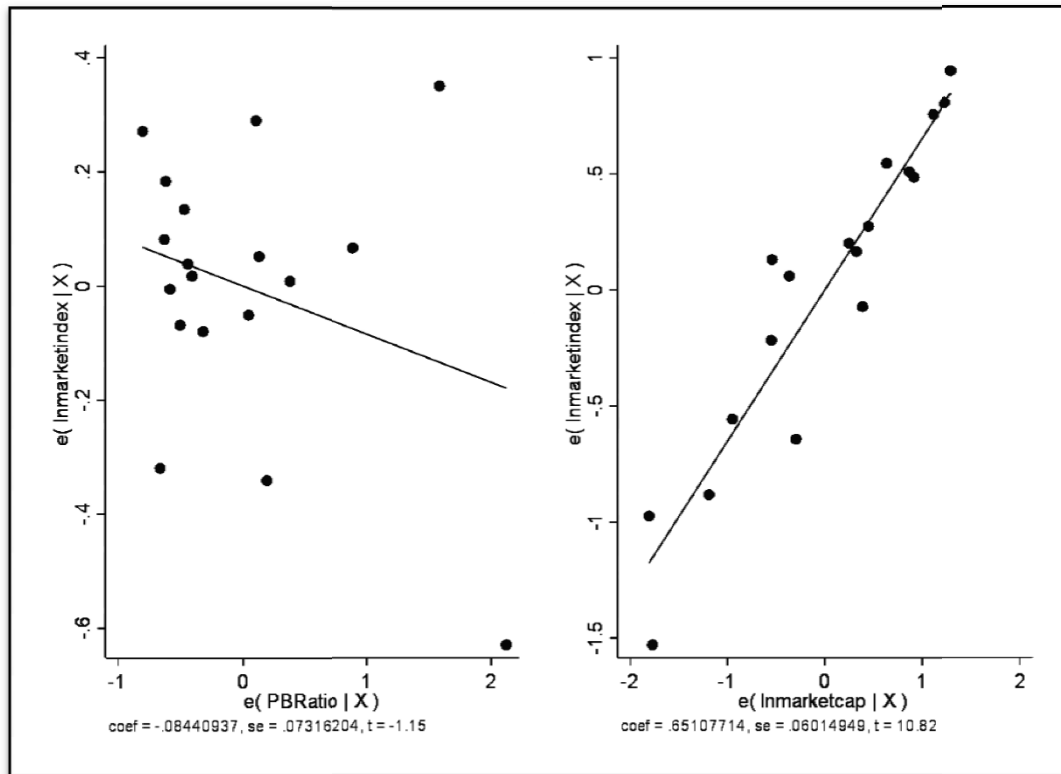

Figure 01, show the regression curve fitting for the independent variables in Model 01. Market Capitalization has significant positive linear relation with market index. The PB Ratio although not significant, shows a negative relationship with market index.

Model 02-

Table 02, show the regression results along with Durbin-Watson values for Model-02. The model is based on econometric model as in equation no. 02. The significant determinants of market index in Model 02 are Market Capitalization (at p value 0.01) and PE Ratio (at p value 0.1). The Durbin-Watson value is 2.54 which determine a robust model. The value of R-squared is 0.9 which is again robust.

Table 02- Model 02

lnmarketindex	Coef.	St.Err.	t-value	p-value	(95% Conf	Interval)	Sig
PERatio	-0.055	0.030	-1.88	0.080	-0.118	0.008	*
lnmarketcap	0.755	0.083	9.08	0.000	0.578	0.932	***
Constant	-0.793	0.935	-0.85	0.410	-2.786	1.201	

Durbin-Watson d-statistic(3,   18) = 2.54661

Mean dependent var	9.704	SD dependent var	0.683
R-squared	0.900	Number of obs	18.000
F-test	67.758	Prob> F	0.000
Akaike crit. (AIC)	0.828	Bayesian crit. (BIC)	3.499

*** p<0.01, ** p<0.05, * p<0.1

lnmarketindex – log of index closing on annual basis; lnmarketcap- log of market capitalization

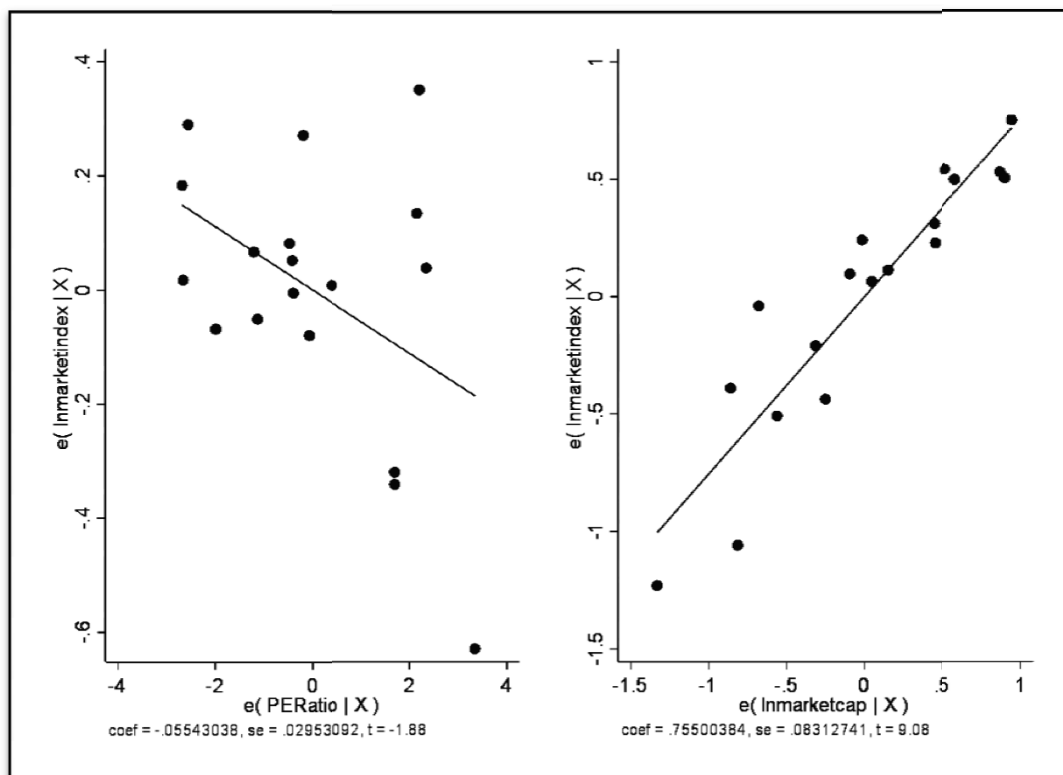**Figure 2: Regression Curve Fitting for Independent Variables for Model 02**

Figure 02, show the regression curve fitting for the independent variables in Model 02. Market Capitalization has significant positive linear relation with market index. The PE Ratio on the other hand shows a negative relationship with market index.

Model-03

Table 03, show the regression results along with Durbin-Watson values for Model-03. The model is based on econometric model as in equation no. 03. The significant determinants of market index in Model 03 is Market Capitalization (at p value 0.01). The Durbin-Watson value is 2.51 which determine a robust model. The value of R-squared is 0.902 which is again robust.

Table03- Model 03

Lnmarketindex	Coef.	St.Err.	t-value	p-value	(95% Conf	Interval)	Sig
PBRatio	-0.037	0.078	-0.47	0.645	-0.203	0.130	
PERatio	-0.049	0.033	-1.46	0.166	-0.120	0.023	
Lnmarketcap	0.746	0.087	8.55	0.000	0.559	0.934	***
Constant	-0.664	0.998	-0.67	0.517	-2.806	1.477	
Durbin-Watson d-statistic(4, 18) = 2.51863							
Mean dependent var		9.704	SD dependent var			0.683	
R-squared		0.902	Number of obs			18.000	
F-test		42.904	Prob> F			0.000	
Akaike crit. (AIC)		2.545	Bayesian crit. (BIC)			6.106	

*** p<0.01, ** p<0.05, * p<0.1

lnmarketindex – log of index closing on annual basis; lnmarketcap- log of market capitalization

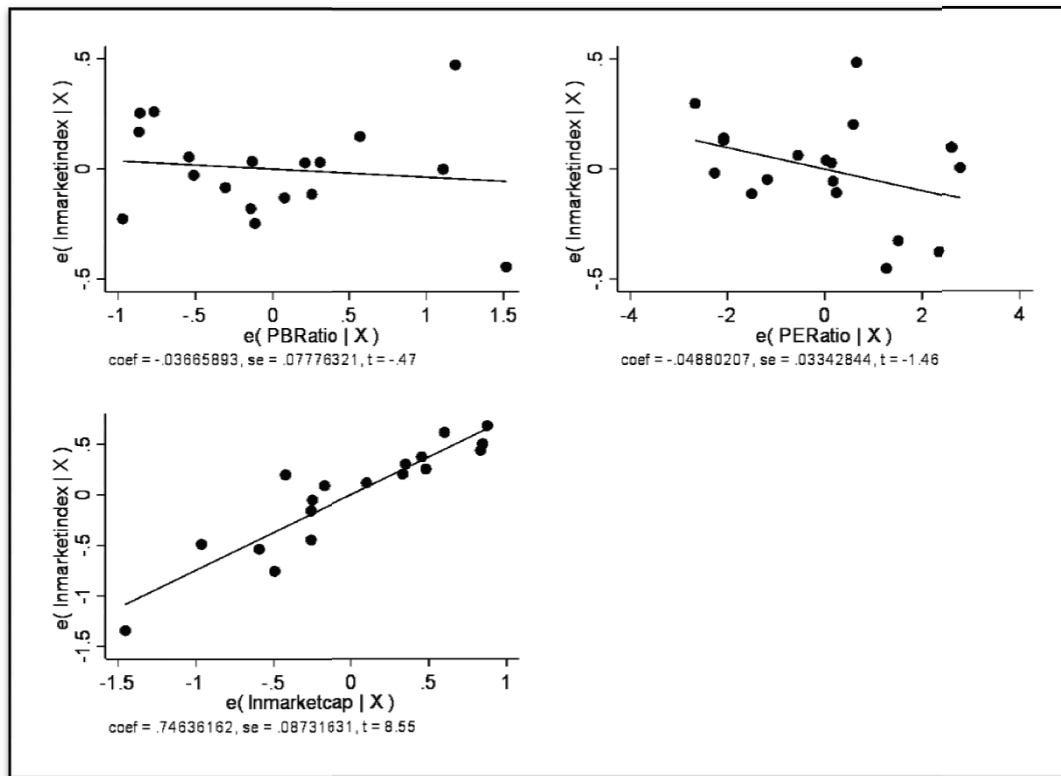**Figure 3: Regression Curve Fitting for Independent Variables for Model 03**

Figure 03, show the regression curve fitting for the independent variables in Model 03. Market Capitalization has significant positive linear relation with market index. The PB Ratio and PE Ratio, although not significant, show a negative relationship with market index.

III. Validation of Hypotheses

1) Market Capitalization (sig. at p value 0.01) solely taken in unison with PB Ratio (non- sig.) is a significant predictor of Market Index. Thus we reject the null hypothesis 'H0:1

– PB Ratio along with Market Size has no significant impact on Market Index'.

2) Market Capitalization (at p value 0.01) and PE Ratio (at p value 0.1) taken in unison

together are a significant predictor of Market Index; thus we reject the null hypothesis 'H0:2 – PE Ratio along with Market Size has no significant impact on Market Index'.

3) Market Capitalization (sig at p value 0.01) taken in unison with PB Ratio (non-sig.) and PE Ratio (non-sig.) is a predictor of Market Index; thus we reject the null hypothesis 'H0:3– PB Ratio, PE Ratio along with Market Size has no significant impact on Market Index' .

IV. Conclusion and Discussion

Our work affirms that with each financial and operating result of companies and for making assessments, the top management, the financial analysts and the investors may rely on a specified collection of financial ratios in their appraisal. To carry out a financial review procedure in an effective and price-desired way for

investors and analysts, it needs the application of several metrics to assess achievement and compare the outcomes of the same segment with others. The findings of the study show that the groups of ratios taken in unison have a significant impact on stock prices. The application of these financial ratios (Market capitalization, PB ratio and PE Ratio) increases predictability of asset prices.

In particular our study shows that how market capitalization, market PB Ratio and market PE Ratio interact together with each other and individually to impact the Market Index. The results support the hypothesis that market capitalization significantly affects the market index. Also our models suggest that PB Ratio and PE Ratio effect markets in negative way rather than positive way. The important finding of this study concludes that whenever market capitalization increases, the market indices will rise. If the PB ratio and PE Ratio of the market is higher than market indices will decrease. The important finding and conclusion of this study suggests a stock market strategy that higher PB Ratios and higher PE Ratios result in fall in market index, and an increase in market capitalization in the market will lead to rise in market indices.

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