

STOCK MARKET PREDICTABILITY: DOES TRADITIONAL CAPM MODEL HOLDS GOOD IN RECENT TIMES ON INDIAN COMPANIES

Shubhra Johri¹, Ms. Taru Maheshwari², Ms. Purwa Srivastva³,

^{1,2} Sr. Asst. Professor, ³ Asst. Professor, MBA Deptt ABES-EC, Gzbd, AKTU

ABSTRACT

Stock market these days has turned out to be a major source of wealth creation for a number of players in the economy. For those who know the pulse of the market and are aware of the gaming tactics, Price movements in the market are influenced by a number of factors both macro and micro economic, a few being: firm's policies, economic conditions, investor expectation and psychology, political events etc. A capability to predict accurately stock values beforehand by even a few seconds can do wonders as far as making money is concerned. Stock market prediction thus has become one of the hottest fields as far as financial researches are concerned. But a basic question that arises is: Can the stock market be predicted? A number of theories and models have been developed in an attempt to predict the unpredictable. But do these theories work in practice? CAPM model has been one of the landmark paper achievements in this regard. This research focuses on the basic issues in stock market prediction and analyzing the validity of CAPM in predicting the unknown. Research Analysis comprises of various Indian Companies from different sectors. Z Test, Regression & Co-relation is used to test the predictability.

Keywords: Beta, Market Return, Asset Return, Risk free return

I. INTRODUCTION

Stock market prediction is very important from the investor point of view. Stock market can offer real attractive benefits. Such investments though they offer incredible opportunities to earn but still are very risky ventures and hence require a thorough understanding of the market trends on part of the investor. Stock market by nature is a very complex and volatile one. There is innumerable number of players striking the stock floor in anticipation of making big money but not everyone is able to strike the right chord. While some gain the others even loose. What makes the difference is the capability to judge the appropriate time to buy, hold or sell. Forecasting price movements in the stock market has been a major challenge for investors, businesses, brokers, and speculators. While people spend a lot of time, money and effort but still are not able to figure out why the stock market acts the way it does. Though there are a number of theories trying to predict the uncertainty but there is only one thing that we can be sure of while predicting the stock market, that nothing is certain. This research aims at testing the predictability of stock market with CAPM Model

II. LITERATURE REVIEW

Predicting stock market returns have been one of the favorite topic for researchers trying to tap the enormous returns that the stock market has to offer. A number of studies have been done in this regard. A number of theories have been developed and still researches are going on to bring about improvements in the already existing theories. Ronald J. Balver, Thomas F. Cosimano, Bill McDonald in their paper Predicting Stock Returns in an Efficient Market (2012) examined the empirical relationship between financial asset return and movements in aggregate output. They suggested that stock returns can be predicted based on rational forecasts of output. They concluded that stock returns are a predictable function of aggregate output and also support the accompanying implications of the inter temporal general equilibrium model. Donald B. Keim and Robert F. Stambaugh tried to relate returns on stocks and bonds with previous levels of asset prices and found seasonality in several conditional risk measures. They concluded that returns on small –firm stocks and low grade bonds had high level of seasonal correlation with previous levels of asset prices. Poterba and Summers (1988) were of the opinion that there was a weak degree of predictability of stock returns based on historical values. A few even attributed a number of variables which can predict future market behavior. Campbell (1991) examined the same for short term interest rates. Many researchers like Valkanov(2003), Ferson, Sarkissian and SImin (2003), Ang and Bekaert (2003), and Goyal and Welch (2003) criticized predictability factor

In an attempt to explain better the price behavior of securities in a security market Sharpe(1964), Lintner (1965) and Mossin (1966) came up with a pioneering work in the form of a formalized model called CAPM. Since then a lot of work has been done to empirically prove its validity and to bring about improvements in this direction. The CAPM predicted that the excess returns of a stock are proportional to the market premium. Proportionality factor being a measure of systematic risk i.e. beta. While there were a lot of studies which were supportive of the implications of this model there were even some studies which casted a doubt on its validity. Douglas (1969) was the first to cast doubt on the empirical content of the model. HE argued that unlike the conclusions of the CAPM model non-systematic risk did seem to explain average returns he even argued that the intercept of SML was greater than R_f as supposed by the original model. In 1972 Miller and Scholars figured out some statistical problems that hinder a straightforward test as that used by Douglas. Later researchers like Black et al. (1972), Fama and MacBeth(1973) even tried to provide a positive evidence on the validity of CAPM. Levy (1977) even tried to relate beta values with time horizon used for research. He concluded that if analysts used a shorter time horizon then the beta estimates were biased. To further his effort Fama(1980) came up with a postulate that the power of macro economic variables in explaining the stock prices increases with the increase in time horizon. Again studies made by Roll suggested that since the true market portfolio can never be observed, the CAPM is necessarily un testable. Even researchers like Banz (1981), Reinganum (1981), Gibbons (1982), Shanken (1985) highlighted the dangers of focusing exclusively on mean – beta space. Then came the work of Fama and French (1990) which claimed that once you control for a set of widely followed characteristics of the firm, such as the ratio of market value to book value, the firm's beta does not contribute anything to the prediction of future returns. While talking exclusively for Indian markets Amheshwari & Vanjara (1989), Madhusoodanan (1997),

Sehgal (1997), Vipul (a998) and a lot others found CAPM was not suitable for describing Indian Market. In global context Grigoris Michailidis, Stavros Tsoopoglou, DEmetrios Papanastasiou (2006) even studied CAPM for Greek stock market their findings were supportive of the fact that relationship between firms beta and return is a non-linear one. Even studies by AdityaY JAvid & Eatzaz Ahmad (2008) at Karachi stock exchange do not support CAPM model .Jonali Sharma and Pranita Sharma (2008) studied stability of stock betas on BSE and concluded that betas are unstable over time Sromon Das (2007) tested beta stability at NSE using two different methods and concluded that in the first method 85% stocks had stable betas while under the second method 65% stocks exhibited beta stability . Despite a large body of evidence in the academic literature in favour of the Fama and French model, for estimation of portfolio returns, practitioners seem to prefer CAPM for estimating cost of equity :Bruner, Eades, Harris, & Higgins, 1998; Graham & Harvey, 2001.

The basic limitation of CAPM – the unrealistic assumptions and lack of empirical evidence – paved way to the development of the APT model (Ross 1977).

Berry et al (1998), propounded that APT model is better in comparison to CAPM in explaining equity returns .Josev et al. (2001) concluded for Australian industry equity portfolios in favour of the APT model .A Study on Indian markets by Dhankar (2005) was strongly of the opinion that APT provides a better warning of asset risk and estimates of required rate of return. GurHuberman et. Al (2005) , Paavola (2006) & Devinaga Rasiah et. Al (2011) advocated the supremacy of APT over CAPM .Morel (2001) advocated that the biggest limitation of APT is that it does not identify the common factors. Gilles and LeRoy (1990) were of the opinion that APT contains no useful information on prices and assumed APT to be a very generalized model.

Furter efforts in the direction of stock market prediction include that of Md. Rafiul Hassan and Baikunth Nath .They used Hidden Markov Models (HMM) approach for forecasting stock price for interrelated markets. There are many other methods such as neural networks etc, for predicting stock market returns.. but we are not reserving review of the same in our thesis rather than in the synopsis as the methods are more complicated for a retail investor

III. RESEARCH OBJECTIVES

- To analyze whether an accurate prediction of stock market is possible or not.
- To find out the various models that have been developed to predict the stock market.
- To gain an insight into whether these models hold well given the volatile nature of the stock market.
- To find use of CAPM as a model of prediction.
- To study whether there is proof that Indian stocks are valued according to systematic risks with the market
- To study whether there are other factors that determine the value of stocks and to determine the relative importance of these factors.

IV. RESEARCH METHODOLOGY

Data:

Data is collected from various financial websites like yahoo finance for index prices of BSE and NSE. Both the indices have a collection of diversified stocks from multiple industries which we assume will give a generalized representation of the overall Indian market.

Sample size and Selection Process:

A sample of 50 companies is selected for the purpose of our study .Out of the 50 companies selected: 10 companies are from FMCG sector, 10 is from IT sector, 10 from Pharma , 10 from Telecom Sector and 10 from Auto sector. The basic intention behind making such a choice is that all these sectors represent major chunk of the market and contribute to GDP.

Period of study:

The period of study chosen is 10 years from 2003 – 2012. This period is good for study as it an all exhaustive one covering almost all phases of business cycle. This phase has witnessed prosperity, boom, recession, depression and recovery and hence will cover the whole dynamics of economic environment in which the companies are operating.

CAPM model will be tested for the chosen 50 companies for the above mentioned period and a comparative study vis-à-vis other models will be done. Results will tested using rigorous significance tests at 0.01 and 0.05 level of significance Z test is used to test the hypothesis .We will do the activity for both Sensex and Nifty.

V. HYPOTHESIS TESTED

The following hypotheses have been set and tested.

1. H0: The relationship between asset return & corresponding β value as posed by CAPM is valid in Indian context
2. H0: Stock β are stable over time

Data Analysis:

- An analysis has been done on FMCG, IT, Pharma & Telecom sector to analysis whether expected return from CAPM Model prove correct when compared to actual return gained by share prices on the stock market.
- For this Repo Rate has been taken as risk free return . Beta is calculated through Regression Analysis and CAGR is the difference between expected and actual return.
- After calculation of beta expected return is calculated using CAPM Model:
$$E(r) = R_f + \beta (R_m - R_f)$$
$$R_m = \frac{R_{m2} - R_{m1}}{R_{m1}} * 100$$
- Next step was to calculate actual return of the stock
$$A_r = \frac{R_2 - R_1}{R_1} * 100$$
- CAGR is the difference between expected and actual return.

4th International Conference on Science, Technology and Management

India International Centre, New Delhi

15th May 2016, www.conferenceworld.in

(ICSTM-16)

ISBN: 978-81-932074-8-2

- Then Z test is applied to check mean difference between A(r) and E(r) and the following table shows the data so derived:

Sectors	Beta	CAR	Z
FMCG			
Emami	0.079805448	16.2846846	-122.90415
Nestle	0.089689158	0.1000868	-2.1140339
p&g	0.075422479	0.07091591	-130.37562
PAMOLIVE	0.079805448	0.07049647	-123.35948
Dabur	0.144061322	0.06548075	-65.082228
HMT	0.073010466	0.00002131	-0.545669
Nestle	0.089689158	0.00008679	-114
HUL	0.165500022	0.06367938	-79.288334
ITC	0.990834803	-0.10085412	4.5054687
J&J	0.018354252	-0.10052256	3.1612041
IT			
Tech			
Mahindra	0.230525203	0.05751657	5.751657
Wipro	0.070502625	0.07206126	-69.927473
BajajHint	0.408005928	0.01158071	2.7036064
Dell	0.143490036	0.01092679	5.2188701
HCL	0.19579505	0.06068591	3.0024
HP	0.223113749	0.10165044	2.679238
IBM	0.000140027	0.33334264-	8.510595
TCS	-0.00061303	0.15397574	5.569417
Accenture	0.000130027	-0.03434264	8.410595
Infosysis	0.071502625	0.07306126	-79.927473
Pharma			
Pfizer	-0.05428619	0.08049561	-143.22665
Cipla	-0.06429619	0.09049561	-86.878665
Nector	0.388776108	0.01123153	6.8586
Arti Drugs	-0.16675086	0.08668692	-50.0405
Aurobindo	0.283485823	0.05341055	-34.922301

4th International Conference on Science, Technology and Management

India International Centre, New Delhi

15th May 2016, www.conferenceworld.in

(ICSTM-16)

ISBN: 978-81-932074-8-2

GTL	0.050137157	0.00267618	-1.7029511
Lupin	0.986467204	0.10057315	-9.35921
Mphasis	0.135678207	0.10044168	-4.118975
Nelco	0.041837366	0.00073084	-4.307618
Surya Pharm	0.941320656	0.01111339	-4.3619552
Telecom			
Reliance	0.058085141	-0.10032417	3.5399051
Airtel	0.98598401	0.10172864	2.0030558
Gemini	-0.000001	0.52338496	7.2370206
Idea	0.008073808	0.07618584	1.236E-141
ITI	-0.05336485	-0.00052287	7.5940416
MTNL	0.073841106	0.10155398	3.6430703
Relington	0.111872176	0.10037373	7.4573965
Tata	0.209762697	0.00063192	6.3599802
Videocone	0.024522438	-0.10011716	9.284874
BSNL	0.072741106	0.10146398	3.653307
Auto			
Kinetic	0.198820519	0.06327259	-32.820106
Toyota	-0.01125616	0.07739326	-85.520309
Bajaj	0.072928067	0.07117514	7.212E-171
Honda	-0.16495127	0.09019676	1.364E-188
Tata	0.119452755	0.0690453	2.264E-117
Bajaj			
Hindustan	0.408005928	0.10158071	6.5104608
Furiford	-0.13604353	0.086727	1.434E-126
Hero	-0.2773258	-0.00036504	4.6102257
Mahindra	0.043021195	0.07275052	2.917E-187
Maruti	-0.04106552	0.07984593	6.5159391

Z Test is used to test the hypothesis . The companies having value lies outside 1.98 to -1.98 which proves that the relationship between asset return & corresponding β value as posed by CAPM is invalid in Indian context and also beta is not stable over a period of time as represented by the above table.

VI. CONCLUSION

The problem under investigation holds a lot of importance given the volatile nature of the stock market. Of the various theories developed so far CAPM has been one of the major achievements and hence the research aims at analyzing the validity of CAPM given the unpredictable and volatile conditions proves insignificant and predicts that stock market is unpredictable .

REFERENCES

1. Abhyankar, A., Copeland, L. S., & Wong, W. (1997). Uncovering nonlinear structure in real-time stock market indexes: The S&P 500, the DAX, the Nikkei 225, and the FTSE-100. *Journal of Business & Economic Statistics*
2. Fama, Eugene (1970), "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance*.
3. Goutam Dutta, Pankaj Jha, Arnab Kumar Laha and Neeraj Mohan Artificial Neural Network Models for Forecasting Stock Price Index in the Bombay Stock Exchange *Journal of Emerging Market Finance*
4. X. Li, C. Wang, J. Dong, F. Wang, X. Deng, and S. Zhu. Improving stock market prediction by integrating both market news and stock prices.
5. R. Schumaker and H. Chen. . *ACM Transactions on Information Systems (TOIS)*, 2009.
6. Textual analysis of stock market prediction using breaking financial news: The AZFin text system Fama, E.F. and French, K.R. (2004), *The Capital Asset Pricing Model: Theory and Evidence*
7. Banz, R.(1981), *The Relationships between Returns and Market Value and Return for NYSE*
8. *Common Stock: Further Evidence?*. *Journal of Financial Economics*
9. Eugene Fama and James MacBeth.1973. Risk, Return and Equilibrium: Empirical Tests. *Journal of Political Economy*
10. Fama, E., & French, K. 1993.Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*
11. Jan.B. & Paula Peare.2005. Estimation of Expected Return: CAPM vs Fama and French. *International Review of Financial Analysis*
12. Lintner, J., 1965. The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economic Statistics*
13. Mossin, J., 1966. Equilibrium in a capital asset market, *Econometrica*
14. Sharpe, w., 1964. Capital asset prices: a theory of market equilibrium under conditions of risk. *Journal of Finance*
15. Fama and French (1996). CAPM wanted dead or alive. *The journal of finance*
16. Groenewold and Fraser, (1997). Share prices and macroeconomic factors. *Journal of Business Finance and Accounting*, Vol. 24
17. Ammann M, Verhofen M (2007). Testing conditional asset pricing models using a Markov chain Monte Carlo approach.

4th International Conference on Science, Technology and Management

India International Centre, New Delhi

15th May 2016, www.conferenceworld.in

(ICSTM-16)

ISBN: 978-81-932074-8-2

18. Ross SA (1976). The arbitrage theory of capital asset pricing. J. Econ. Theory
19. Sharpe W (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. J. Finance
20. Roll R (1977). A critique of the asset pricing theory's tests: Part I: On the past and potential testability of the theory. J. Finance & Economics.
21. Mossin J (1966). Equilibrium in a Capital Asset Market. Econometrica.
22. Lintner J (1965). The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. Rev. Econ. Stat.