An Empirical study on Portfolio performance

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Abstract

In this article, we considered a risk-adjusted performance measure which benefits from a large success among the portfolio management community. Namely, Sharpe ratio, Jenson ratio and Treynor ratio. We calculated returns and risk-adjusted ratios: the Treynor's ratio, the Sharpe's ratio and the Jensen's ratio. From the results we identified the best 10 performing stock out of sample companies. The empirical study found that investing on government under taking companies like STATE BANK OF INDIA, NMDC will provide risk free returns

Key Words: risk-adjusted performance, Sharpe ratio, Jensen's ratio, Treynor's ratio

Introduction

Individuals throughout their life earn money and spend it to meet their desires. Sometimes if current income exceeds then person will go for investing in stock market based upon their objectives. Mainly investment is expected on maximum return and minimum risk in line with time. Hence investment in one or two security rather than invest in mixture of securities so that expected return with less risk can be achieved. A bunch of securities include different sectors like shares of PSU's , MNC's, Banks and different companies, which provides different return based upon their performance and demand in the market. This in turn provides a positive and expected return. Portfolio management is an art of making decisions about investing mix, policy, objectives and asset allocation on different institutions or an individual and also balancing risk against the performance. In simple term it is an art of managing investor's money by portfolio manager. Portfolio can be rebalanced by portfolio managers every day. Portfolio can be done through with the guidance of portfolio manager. There are 3 portfolio managements. Those are given below

1. Discretionary portfolio management: Where portfolio manager will authorize to deal investors all fund, paper works.
2. Non discretionary portfolio management: Portfolio manager suggesting ideas to investor for decision making but execution done by portfolio manager only.
3. Advisory portfolio management: Suggesting investment ideas by portfolio manager but decision and execution done by investors.

Literature Review

Khedkar (2014) analysed on portfolio investment on commercial banks in India with in the period of 2000-2010,data collection from annual reports of bank SBI, PNB, Canara bank, ICICI bank , Citi bank and RBI published bulletin, trend analysis on correlation, regression, analysis of variance (ANOVA),the research shows that the commercial banks role in securuty market develops the financial market in to inclination. Vasantha, Uma Maheswari and

Subashini, (2013), Evaluating the Performance of some chose open finished value enhanced Mutual reserve in Indian common store Industry. The goal of the exploration paper is to assess the execution of particular open finished value enhanced Mutual store in the Indian value advertise. Reason for existing is to direct this investigation over the time of 60 months information which is from January 2008 to December 2012 on HDFC top 200 store (g).Reliance top 200(g) ICICI prudential best 200(g). Canara Robeco value differentiated reserve (g).Birla Sun Life bleeding edge value (g) shared assets. The examination has been made based on Sharpe, Treynor ratio and Jenson alpha**.** Zahir and Sharma (1982) evaluated on the performance on commercial banks with nationalized banks and also comparison with interbank with intra bank level, duration 1970-79 by bank annual reports, area sampling method is applied on investment, result shows that performing branch of commercial banks provided growth in the economy. Hilsted (2012) provided review on active portfolio management and portfolio construction-implementation an investment strategy. Providing risk reduction and acquiring high return on combining assets in to single asset investment. From January 1992 to December 2011. Data have been extracted from DataStream, MSCI Barra and Statistikbanken. CAPM model and Markowitz mean,varience portfolio model is used for analysis, this result shows fixed systematic risk crosses the benchmark risk then portfolio return is positive significant. Carlsen (1970) researched on the risk balanced execution and underscored. The conclusions drawn from figuring of profit depends for the day and age yearly information for 82 regular stock supports over the 1948-67 periods, sort of store and the decision of benchmark. Recalculated the Jensen and Shape comes about. The outcomes repudiated both Sharpe and Jensen measures. Prajapati and Patel (2012) assessed Comparative Study On Performance Evaluation of Mutual Fund Schemes Of Indian Companies. The investigation term is first January 2007 to 31st December, 2011. Execution assessment of Indian common assets is helped out through relative execution list, hazard return investigation, Treynor's proportion, Sharp's proportion, Sharp's measure, Jensen's measure, and Fama's measure. Research procedure is utilizing on information utilized is every day shutting NAVs. The wellspring of information is site of Association of Mutual Funds in India (AMFI). The aftereffects of execution measures positive return. C.Yadav and Hemanth (2014), have assessed on Performance of Selected Equity Growth Mutual Funds in India. Concentrate amid first June 2010 to 31st May 2013. The investigation assesses execution of chose development value subsidizes in India, utilizing portfolio execution assessment strategies, for example, Sharpe and Treynor measure. Information gathered from S&P CNX NIFTY has taken as the benchmark utilizing 15 value development Schemes (NAV) were taken from top 10 AMCs. At long last presumed that exceptional yield saw from definite outcome. Klemosky (1973) broke down venture execution of 40 stores in view of quarterly returns. Study has been finished amid the period 1966-71.Study recognized predispositions in Sharpe, Treynor, and Jensen's measures and expelled by utilizing mean supreme deviation and semi-standard deviation as hazard contrasted with the composite measures got from the CAPM (Capital Asset Pricing Model). Gupta (1974) inspected the execution of common reserve industry. Span of the investigation began 1962-1971.Research had been utilizing Sharpe, Treynor and Jensen models. Assets had picked in this examination beat the market without considering of market list. Accepting return per unit of hazard which fluctuated with the level of unpredictability and reasoned that assets with higher instability displayed

predominant execution. At long last outcomes demonstrated that indistinguishable outcomes gave by all the three models. Shah (2015) investigated that construction of optimal portfolio using Sharpe index model and CAPM model, descriptive research is done during 2000-2015,datas are collected from monthly data on BSE top 15 securities on market capitalization, tools used are standard deviation, expected return, variance, Sharpe model and also using CAPM model, Sharpe Model suggests the portfolio of equities but CAPM indicates individual securities, hence in portfolio, if some securities returns are negative then investor can cover his loss from other securities included in his portfolio. James R.F. Fellow (1978) analyzed the risk balanced execution of UK venture trusts through the use of Sharpe and Jensen measures. The examination reasons that no trust had shown better execution analyzed than the London Stock Exchange Index. Fama (1972) built up an approach for assessing speculation execution of oversaw portfolios and recommended that the general execution could be separated into a few components. George argon and Wayne E Ferson (2006) investigated on portfolio performance evaluation on monthly return during 1963-2000 for Sharpe ratio and 1990-2000 for Jensen ratio. Performance is perfectly matched with benchmark hence added for the benefit to the investor. Gupta and Ramesh (1993) examined an examination on "Portfolio Management for an Individual Investor". Had experienced the significance of people interests in portfolio administration. By examining an Individual investors' situation of their own attributes, for example, age, well being condition, family obligation, business or expert circumstance and assessment status. Every one of these variables influence the financial specialist's ability to go out on a risk. Rajarajan (2002) looked into with 54 articles on "Determinants of Portfolio Choice of individual Investors" in the midst of the season of 2001-2005. The examination reveals an outcome of luckiness, possibility and fate et cetera, in this way theorists with cut down expected rate of return, cut down risk bearing cutoff and incident avoiding conduct slant toward the portfolio with a more noteworthy measure of settled assets likewise the money related pros with high expected rate of return, high danger bearing point of confinement and less of hardship avoidance lead support a portfolio with a more noteworthy measure of perilous assets. In this way from the result it has assumed that the examiners slant toward a portfolio with a more prominent measure of dangerous asset. Seth, Deepika (2013) analyzed the performance of portfolio management on asset management companies asset management company's in India, explored on investors interest on investment during the period of 2006-2011 through descriptive and explanatory research and data's are collected from SEBI, companies annual reports and other government agencies and fund managers, concluded with the result that an efficient financial investment with minimum risk can be achieved through portfolio management. Lamba (2014) has completed a printed material on Portfolio Management in India. The reason for the investigation is to dissect the extension and significance of portfolio administration in India. Printed material additionally demonstrates that the sorts and ventures of portfolio administration and which speculation should taken by a portfolio chief to give most extreme returns and least hazard to his customers for their speculations. Mahajan, Mahesh (2012) examined the management of portfolio research study of investor in Mumbai city, with an objective of maximizing wealth with respective individual needs and risk preference, duration of the study from July 2011 to January 2012,descriptive and casual research had been designed for the relative questionnaire and data's were taken from journals, magazines and websites. Finally results shows that

investor in Mumbai are highly educated hence depending upon their objectives, investing in different investment. In order to get wealth maximizing, tax savings, life insurance, mutual funds, post office schemes and real estate, gold and silver investment avenues. Vandell and Finn (1982) investigated on the article "Portfolio Objective: Win big, lose little!" was published on the Journal of Portfolio Management, concluded that systematically the market does not appear for risk-taking, hence it is a game of full of opportunities for "those investor who have sufficient skills of trading in stock market." Jensen (1968) assessed a composite portfolio assessment system principally on risk balanced returns. Amid the period 1945-66 assessed 115 store chiefs in choosing the securities and net returns of 39 reserves had better than expected returns however 76 finances anomalous poor returns. In any case, in net returns 48 stores were better than expected outcomes and 67 supports underneath the normal. Consequently Jensen inferred that, 22 reserves perform essentially superior to anything other expected by support administrators and they were not able figure securities value developments in stock exchange.

Statement of the problem

Portfolio keeps up culminate negative connection between's the securities, henceforth continually holding at least two stocks superior to one. Portfolio gives better lucidity to put subsidize in right extent in right stock to get greatest come back with least hazard. A financial specialist faces with the issue of browsing among expansive number of securities to dispense subsidizes over various gathering of securities. Subsequently Sharpe, Treynor, Jensen proportions gives the lucidity among the expansive securities to put and furthermore supportive in maintaining a strategic distance from time cost and information contributing. Since from decade Indian economy is growing simultaneously various sector also growing in tremendous manner. therefore it is an opportunity for investment with proper analysis is to be done by investor for the better return, hence the purpose is made an attempt to select the company which will give the better return with minimal risk, therefore the study is entitled on "study on portfolio management on BSE using Sharpe, Treynor, Jensen ratio"- A study of the 100 stocks that are listed on BSE.

Objectives of the Study

Objective of the project is to identifying the stocks which provide maximum return and minimizing risk by portfolio diversification.

1. To examine the return and risk of different securities.

2. To examine the performance of the company by using Sharpe ratio, Treynor ratio and Jensen alpha.

Sample Data and Methodology

The data is collected from BSE 100 listed companies. The closing prices of the sample companies is collected from 2008-2017 from the https://www.bseindia.com/. Sharpe, Treynor, Jensen ratios are used to see the performance of sample companies.

The Sharpe Ratio is calculated as follows:

Sharpe measure = (Ri-Rf) / σp

Where
Ri- Expected return of portfolio Rf- Risk free rate of return.
σp - Standard deviation of portfolio.

The Treynor ratio is calculated as follows
Treynor measure = (Ri-Rf) / β

 Where
Ri – investment return.
Rf- risk free rate of return like treasury bills. β - Beta of portfolio.

The Jenson ratio is calculated as follows

α = Rp – [Rf +βp (Rm-Rf)]
Where
Rp - Expected total return of portfolio
Rm- Expected market return Rf - Risk free return
βp – Beta of portfolio

Analysis and Interpretation

In this section data analysis is done using three different Ratios

Table 1: Sharpe Ratios of Sample companies	
COMPANY NAME	**SHARPE RATIO**
VAKRANGEE	-0.289
VEDANTA	-0.31
TITAN COMPANY	-0.311
JSW	-0.365
BAJAJ FINANCE	-0.371
BHART ELECTRICAL	-0.377
NMDC	-0.38
STATE BANK OF INDIA	-0.396
TATA GLOBAL BREVARAGE	-0.397

ASIAN PAINTS	-0.397
TATAPOWER	-0.4
AUROBINDO	-0.439
YES BANK	-0.447
TATA MOTOR	-0.46
ADANI	-0.474
AXIS	-0.48
FEDARAL BANK	-0.48
MAHINDRA & MAHINDRA FIN	-0.48
BHARAT HEAVY EARTH	-0.485
BANK OF BARODA	-0.487
PUNJAB NATIONAL BANK	-0.495
CADILA HEALTH	-0.505
LUPIN	-0.516
TECH MAHINDRA	-0.529
OIL AND NATURAL GAS	-0.558
BRITANICA	-0.579
TVS MOTOR COMPANY	-0.583
MOTHERSON	-0.619
BHARAT PETROLEIUM	-0.626
KOTAKA MAHINDRA	-0.627
POWER FINANCE	-0.637
MAHINDRA MAHINDRA	-0.653
UPL	-0.653
ASHOKA	-0.654
RURAL ELECTRIFICATION	-0.656
BAJAJ HOLDING	-0.662
BHARAT FORGE	-0.672
INDIAN OIL	-0.683
RELIANCE INDUSTRIES	-0.689
PETRONET	-0.7
ZEE ENT	-0.702
TATA STEEL	-0.703
L&T	-0.704
SIEMENS	-0.705
INDUSIAND	-0.707
INFOSYS	-0.712
WIPRO	-0.746

BARATI AIRTEL	-0.77
APOLLO	-0.778
INDIABULLS	-0.778
BAJAJ AUTO	-0.78
PIDILITE INDUSTRY	-0.783
TCS	-0.791
MARICO	-0.799
SHRIRAM TRANSPORT	-0.812
ITC	-0.825
CONTAINER	-0.827
PIRAMAL	-0.832
MRF	-0.836
DABUR INDIA	-0.87
ABB	-0.873
TATA CHEMICAL	-0.874
CROMPTON	-0.878
CUMMIN	-0.908
AMBUJA	-0.917
COLGATE	-0.922
MARUTI SUZUKI	-0.939
ULTRATECH CEMENT	-0.977
IDFC	-0.984
ACC	-1.025
POWER GRID	-1.054
NTPC	-1.062
CIPLA	-1.091
COAL INDIA	-1.123
BOSCH	-1.198
NESTLE	-1.271
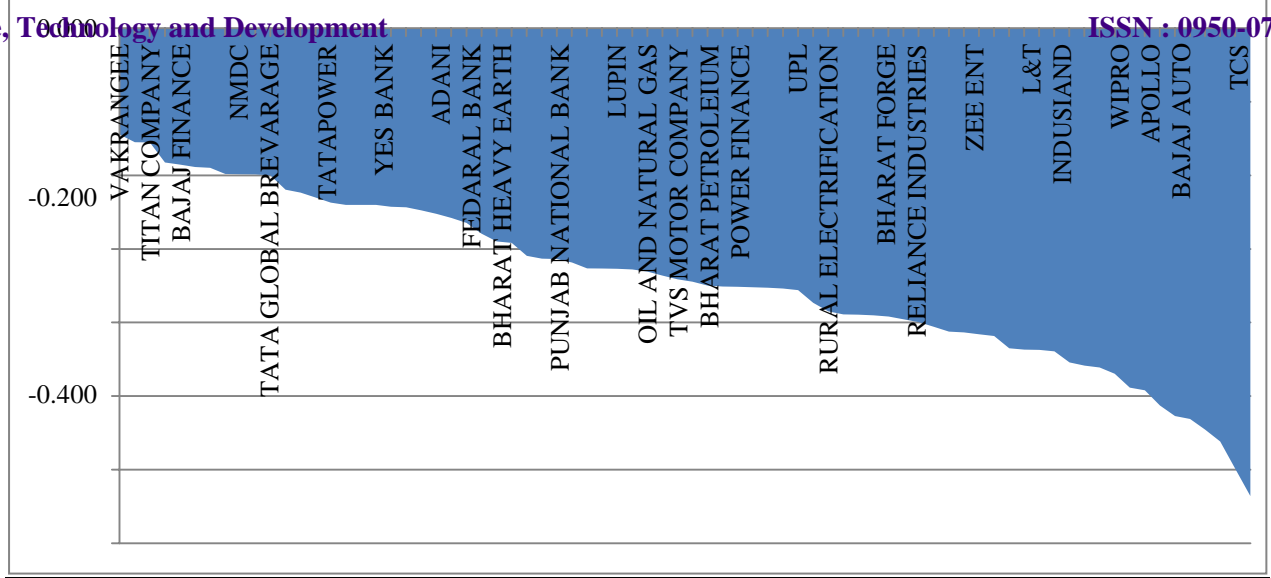
SHARPE RATIO

From the above table it is clear that the sample companies providing negative return, because risk less companies performing better in bear market condition. Negative return on Sharpe ratio represents that riskless assets perform better than others. Negative return is quite common in bear market and also indicates long market down turn.

TREYNOR RATIO:

$$\text{Treynor measure} = \frac{\text{Average rate of return} - \text{Average rate of return on risk free on portfolio Investment}}{\text{Beta of portfolio}}$$

Table 2: Treynor Ratios of Sample Companies	
COMPANY NAME	TREYNOR RATIO
VAKRANGEE	-0.021
VEDANTA	-0.017
TITAN COMPANY	-0.024
JSW	-0.015
BAJAJ FINANCE	-0.023
BHART ELECTRICAL	-0.035
NMDC	-0.023
STATE BANK OF INDIA	-0.019
TATA GLOBAL BREVARAGE	-0.03
ASIAN PAINTS	-0.042
TATAPOWER	-0.02
AUROBINDO	-0.021

YES BANK	-0.014
TATA MOTOR	-0.015
ADANI	-0.02
AXIS	-0.014
FEDARAL BANK	-0.021
MAHINDRA & MAHINDRA FIN	-0.033
BHARAT HEAVY EARTH	-0.018
BANK OF BARODA	-0.019
PUNJAB NATIONAL BANK	-0.019
CADILA HEALTH	-0.052
LUPIN	-0.037
TECH MAHINDRA	-0.023
OIL AND NATURAL GAS	-0.026
BRITANICA	-0.058
TVS MOTOR COMPANY	-0.019
MOTHERSON	-0.032
BHARAT PETROLEIUM	-0.03
KOTAKA MAHINDRA	-0.016
POWER FINANCE	-0.018
MAHINDRA MAHINDRA	-0.02
UPL	-0.022
ASHOKA	-0.019
RURAL ELECTRIFICATION	-0.032
BAJAJ HOLDING	-0.036
BHARAT FORGE	-0.02
INDIAN OIL	-0.032
RELIANCE INDUSTRIES	-0.017
PETRONET	-0.021
ZEE ENT	-0.025
TATA STEEL	-0.014
L&T	-0.017
SIEMENS	-0.018
INDUSIAND	-0.015
INFOSYS	-0.029
WIPRO	-0.026
BARATI AIRTEL	-0.025
APOLLO	-0.043
INDIABULLS	-0.015

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BAJAJ AUTO	-0.026
PIDILITE INDUSTRY	-0.035
TCS	-0.325
MARICO	-0.042
SHRIRAM TRANSPORT	-0.031
ITC	-0.032
CONTAINER	-0.058
PIRAMAL	-0.04
MRF	-0.023
DABUR INDIA	0.042
ABB	-0.023
TATA CHEMICAL	-0.021
CROMPTON	-0.024
CUMMIN	-0.032
AMBUJA	-0.024
COLGATE	-0.057
MARUTI SUZUKI	-0.025
ULTRATECH CEMENT	-0.026
IDFC	-0.016
ACC	-0.025
POWER GRID	-0.025
NTPC	-0.025
CIPLA	-0.036
COAL INDIA	-0.028
BOSCH	-0.047
NESTLE	-0.08
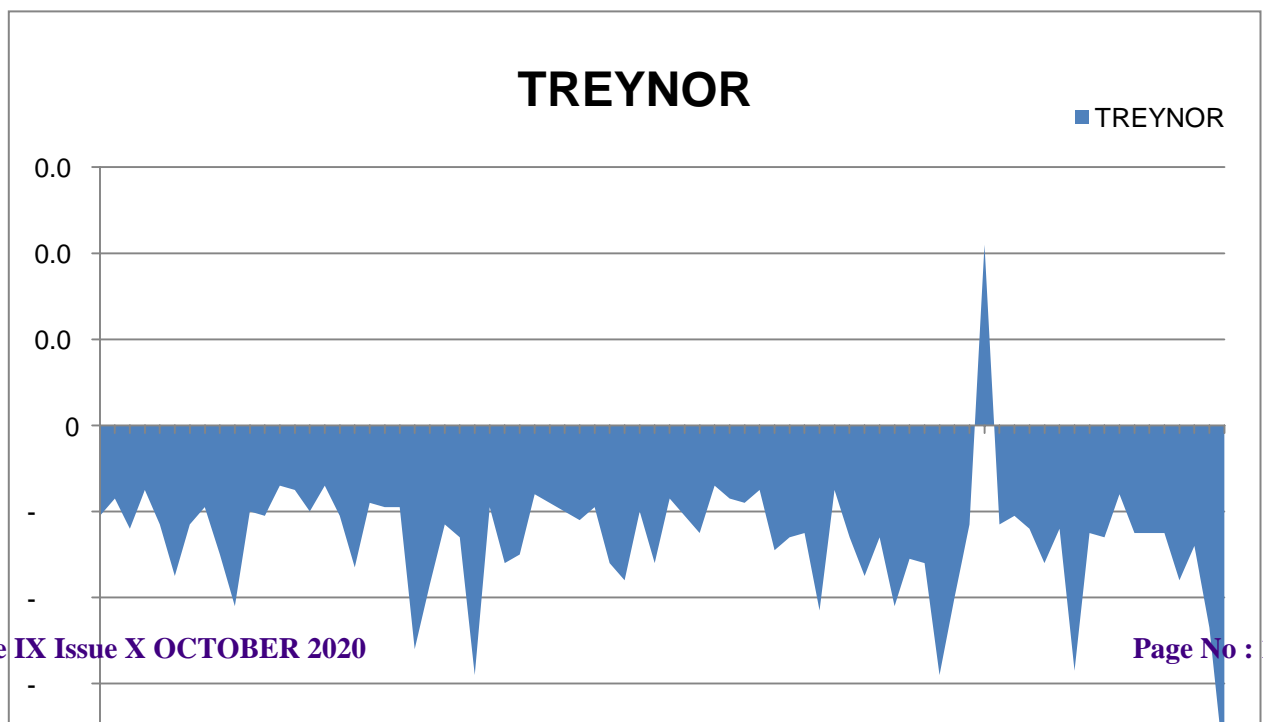
Returns of all companies listed are less than risk-free rate but fund's beta remains positive this indicates that the fund took on systematic risk and didn't exceed the risk-free rate. As Dabur India Company having positive return means for each market risk company generated positive return.

Table 3: Jensen Ratios of Sample Companies	
COMPANY NAME	**JENSEN RATIO**
VAKRANGEE	0.923
VEDANTA	1.246
TITAN COMPANY	0.82
JSW	1.367
BAJAJ FINANCE	0.815
BHART ELECTRICAL	0.576
NMDC	0.93
STATE BANK OF INDIA	1.074
TATA GLOBAL BREVARAGE	0.672
ASIAN PAINTS	0.461
TATAPOWER	1.039
AUROBINDO	0.91
YES BANK	1.444
TATA MOTOR	1.309
ADANI	1.026
AXIS	1.38
FEDARAL BANK	0.954
MAHINDRA & MAHINDRA FIN	0.574
BHARAT HEAVY EARTH	1.159

BANK OF BARODA	1.053
PUNJAB NATIONAL BANK	1.045
CADILA HEALTH	0.364
LUPIN	0.52
TECH MAHINDRA	0.866
OIL AND NATURAL GAS	0.786
BRITANICA	0.317
TVS MOTOR COMPANY	0.973
MOTHERSON	0.583
BHARAT PETROLEUM	0.647
KOTAKA MAHINDRA	1.275
POWER FINANCE	1.128
MAHINDRA MAHINDRA	0.959
UPL	0.886
ASHOKA	1.022
RURAL ELECTRIFICATION	0.601
BAJAJ HOLDING	0.528
BHARAT FORGE	0.983
INDIAN OIL	0.615
RELIANCE INDUSTRIES	1.153
PETRONET	0.9
ZEE ENT	0.776
TATA STEEL	1.416
L&T	1.164
SIEMENS	1.074
INDUSIAND	1.228
INFOSYS	0.669
WIPRO	0.752
BARATI AIRTEL	0.78
APOLLO	0.439
INDIABULLS	1.219
BAJAJ AUTO	0.718
PIDILITE INDUSTRY	0.533
TCS	0.737
MARICO	0.442
SHRIRAM TRANSPORT	0.601
ITC	0.596
CONTAINER	0.326

PIRAMAL	0.463
MRF	0.803
DABUR INDIA	0.448
ABB	0.85
TATA CHEMICAL	0.937
CROMPTON	0.732
CUMMIN	0.585
AMBUJA	0.817
COLGATE	0.323
MARUTI SUZUKI	0.743
ULTRATECH CEMENT	0.716
IDFC	1.28
ACC	0.762
POWER GRID	0.79
NTPC	0.786
CIPLA	0.53
COAL INDIA	0.706
BOSCH	0.392
NESTLE	-0.014

JENSEN RATIO
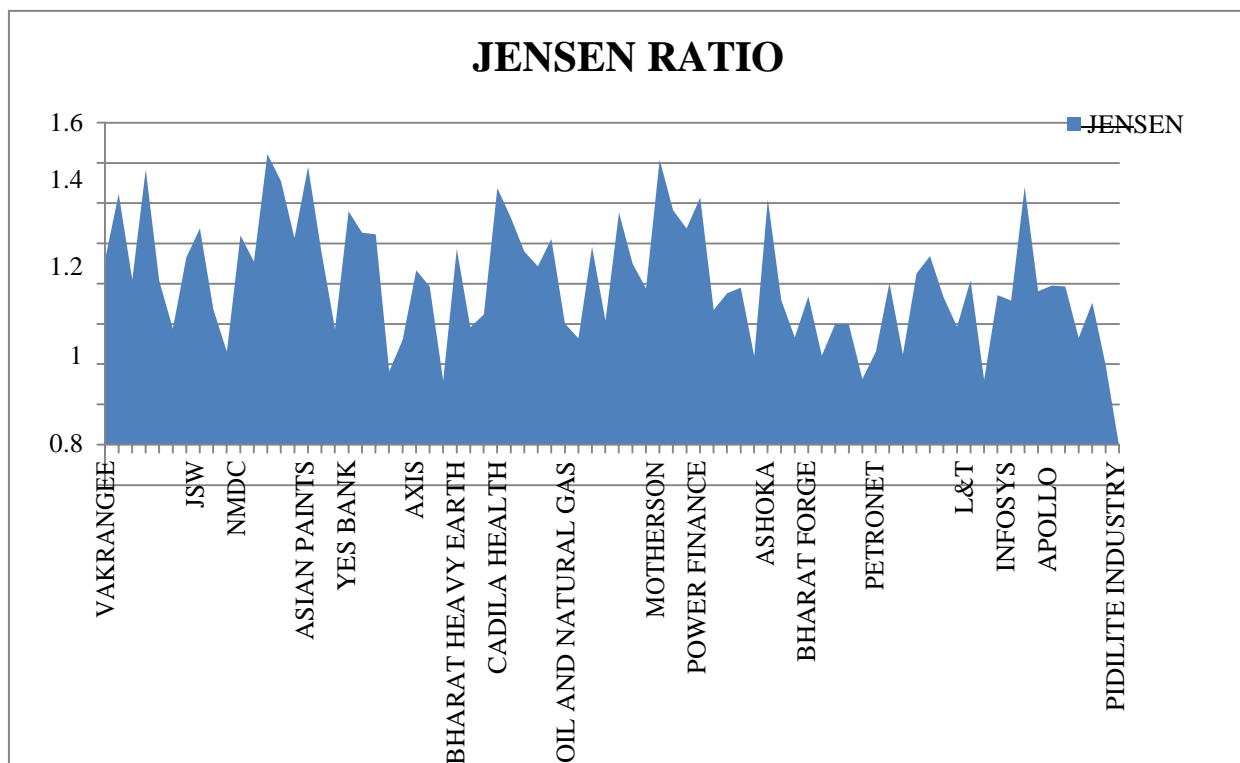
The results show positive return because of beta value. Positive return of all companies indicates companies earned required rate of return, as it was expected by portfolio managers. Hence positive return indicates good indication for the investment.

Table 4: Best performing portfolio			
COMPANY NAME	**SHARPE RATIO**	**TREYNOR RATIO**	**JENSEN RATIO**
VAKRANGEE	-0.289	-0.021	0.923
VEDANTA	-0.31	-0.017	1.246
TITAN COMPANY	-0.311	-0.024	0.82
JSW	-0.365	-0.015	1.367
BAJAJ FINANCE	-0.371	-0.023	0.815
BHART ELECTRICAL	-0.377	-0.035	0.576
NMDC	-0.38	-0.023	0.93
STATE BANK OF INDIA	-0.396	-0.019	1.074
TATA GLOBAL BREVARAGE	-0.397	-0.03	0.672
ASIAN PAINTS	-0.397	-0.042	0.461

According to above graph, Sharpe ratio return have negative return, but in Treynor ratio VEDANTA,JSW STATE BANK OF INDIA,VAKRANGEE are less negative return similarly Jenson alpha ratio VEDANTA, JSW, STATE BANK OF INDIA, VAKRANGEE, NMDC companies are having highest positive return. Hence in order to get better return and minimize the risk by investing according to priority of investor objective, characteristics invest in VEDANTA, JSW, STATE BANKOF INDIA, VAKRANGEE, NMDC companies. Combination or mixture of theses sector will result higher return and stable in market fluctuation and also in inflation.

Conclusion

The above empirical study found that investing on government under taking companies like STATE BANK OF INDIA, NMDC will provide risk free returns. Similarly if country is much more leading for infrastructure and manufacturing sector then investing in companies like VEDANTA,VAKRANGEES, JSW is advisable. As portfolio management is favorable comparing to other class of assets, hence it provides positive return. Portfolio has to improve over time to time and also Selection of right process and suitable technology will better results. It also provides decision making capability in trading.

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