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A STUDY ON PORTFOLIO EVALUATION AND INVESTMENT DECISIONS WITH REFERENCE TO BANKING INDUSTRY IN INDIA

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Abstract: The Stock exchange provides not only free transferability of shares but also makes incessant evaluation of securities traded in the market. The present study is deliberate to examine the Risk & Return Analysis of Selected Stocks in India. Risk may be defined as the chance of variations in actual return. Return is defined as the gain in the value of investment. The return on an investment portfolio helps an investor to evaluate the financial performance of the investment. The main aim of this article is to study the investor to decide effective portfolio of securities. Banking sector is treated as to be in the back bone of the Indian Economy. The task of banking industry is particularly vital as one of the leading and mostly essential service sector. While the Indian economy is yet to catch strength, The Indian banking system continues to deal with improvement in asset quality, execution of sensible risk management practices and capital adequacy.

Keywords: Banking Industry, Investment Decisions, Portfolio Evaluation

1. Introduction

Stock market is a market where a number of Asia today. The Indian market now conforms to securities are traded such as equity shares, international standards in terms of operating debentures, bonds, insurance products, mutual efficiency. In this context, it would be informative funds etc. mostly the existing securities are traded to understand the origin and growth of the Indian in this market. India has one of the oldest stock stock market. The number of stock exchanges markets in Asia and this stock exchange is the virtually remained unchanged for nearly three Bombay Stock Exchange which was established in decades from 1947 to 1977, except for the 1875. It was started under the banner of “The establishment of the Bangalore Stock Exchange in Native Stock and Share Brokers Association”. The 1957. The term ‘investing’ could be associated Indian securities market has become one of the with the different activities, but the common target most dynamic and efficient securities markets in in these activities is to “employ” the money (funds)

during the time period seeking to enhance the investor's wealth. Funds to be invested come from assets already owned, borrowed money and savings. Portfolio is a combination of securities such as stocks, bonds and money market instrument. The process of blending together the broad asset classes so as to obtain optimum return with minimum risk is called portfolio construction. Diversification of investment helps to spread risk over many assets. A diversification of securities gives the assurance of obtaining the anticipated return on the portfolio. In a diversified portfolio, some securities may not perform as expected, but others may exceed the expectation and making the actual return of the portfolio reasonably close to the anticipated one. Keeping a portfolio of single security may lead to greater likelihood of the actual return somewhat different from that of the expected return. Hence, it is a common practice to diversify securities in the portfolio. A portfolio is a combination of securities. The portfolio is constructed in such a manner to meet the investor's goals and objectives.

2. Objectives of the Study

1. To help the investor to decide effective portfolio of securities
2. To identify the best portfolio of securities
3. To clearly defining the portfolio selection process
4. To find out the risk and return of selected equity scrips

3. Statement of the Problem

Every security is underlying with a risk factor. This study is undertaken to calculate return and risk associated with different shares of banking industry listed in Indian stock market (NSE). The risk and return has an inverse relationship. When the expected return is high, the risk associated with such

return is also high. With the understanding of risk and return characteristics one can make rational decision regarding the investment in which company one can invest.

4. Data Analysis and Interpretation

NIFTY Market Index Returns

Table 1

Calculation of Rate of Return

$$\text{Rate of Return} = (\text{closing price} - \text{opening price}) / \text{Closing price} \times 100$$

Opening Year	Opening Price	Closing year	Closing Price	Returns
2014	6537.25	2015	8712.05	24.96313
2015	8712.05	2016	7531.8	-15.6702
2016	7531.8	2017	8927	15.62899
2017	8927	2018	10242.65	12.84482
2018	10242.65	2019	11035.4	7.1837

1. YES BANK

Table 2

Calculation of Rate of Return

$$\text{Rate of return} = (\text{closing price} - \text{opening price}) / \text{closing price} \times 100$$

Opening Year	Opening Price	Closing Year	Closing Price	Returns
2014	76.38	2015	165.52	53.85452
2015	165.52	2016	158.26	-4.58739
2016	158.26	2017	296.27	46.58251
2017	296.27	2018	303.25	2.301731
2018	303.25	2019	232.3	-30.5424
				$\Sigma R = 67.61$

Interpretation: Average rate of return per year of 5 years is $\bar{R} = \Sigma R/n = 67.61/5 = 13.522$

Table 3

Calculation of Standard Deviation

Opening Year	Opening Price	Closing Year	Closing Price	Returns	$R - \bar{R}$	$(R - \bar{R})^2$
2014	76.38	2015	165.52	53.85452	40.328	1626.348
2015	165.52	2016	158.26	-4.58739	-18.102	327.6824
2016	158.26	2017	296.27	46.58251	33.058	1092.831
2017	296.27	2018	303.25	2.301731	-11.222	125.9333
2018	303.25	2019	232.3	-30.5424	-44.062	1941.46
				$\Sigma R = 67.61$		
				$\bar{R} = 13.522$		5114.254

$$\Sigma R = 67.61, \bar{R} = \frac{\Sigma R}{n} = \frac{67.61}{5} = 13.522$$

$$\text{Standard deviation} = \sqrt{\Sigma(R - \bar{R})^2 / n} = \sqrt{5114.254} = 71.513$$

Table 4
Calculation of Beta (β)

Year	Market returns(x)	(X- \bar{X})	(X- \bar{X}) ²	Security returns(y)	(Y- \bar{Y})	(Y- \bar{Y}) ²	(X- \bar{X})(Y- \bar{Y})
2014-2015	24.96	15.974	255.1687	53.85	40.328	1626.348	644.1995
2015-2016	-15.67	24.656	607.9183	-4.58	-18.102	327.6824	446.3229
2016-2017	15.62	6.634	44.00996	46.58	33.058	1092.831	219.3068
2017-2018	12.84	3.854	14.85332	2.3	-11.222	125.9333	-43.2496
2018-2019	7.18	-1.806	3.261636	-30.54	-44.062	1941.46	79.57597
	$\Sigma X = 44.9$		$\Sigma X^2 = 925.2119$	$\Sigma Y = 67.61$		$\Sigma Y^2 = 5114.254$	$\Sigma XY = 1346.156$
	$\bar{X} = 8.986$			$\bar{Y} = 13.522$			

Beta (β) = CO-Variance/Variance = $\Sigma(X-\bar{X})(Y-\bar{Y}) / \Sigma(X-\bar{X})^2 = 1346.156 / 925.2119 = 1.45$

Sharpe Ratio: $S.R. = \bar{R}_p - R_f / SD$ Average return = 13.522

Standard deviation = 71.513

Risk free = 6.3299

Calculation: $S.R. = 13.522 - 6.3299 / 71.513 = 0.1$

Interpretation: The Sharpe's ratio is 0.1 for 5 stocks.

2. AXIS BANK

Table 5

Calculation of Rate of Return

Rate of return = (closing price - opening price) / closing price × 100

Opening Year	Opening Price	Closing Year	Closing Price	Returns
2014	285.31	2015	591.6	51.77
2015	591.6	2016	413	-43.24
2016	413	2017	515	19.8
2017	515	2018	505	-1.98
2018	505	2019	733.4	31.14
				$\Sigma R = 57.5$
				$\bar{R} = 11.5$

Interpretation: Average rate of return per year of 5 years is $\bar{R} = \Sigma R / n = 57.5 / 5 = 11.5$

Table 6

Calculation of Standard Deviation

Opening year	Opening Price	Closing Year	Closing Price	Returns	(R- \bar{R})	(R- \bar{R}) ²
2014	285.31	2015	591.6	51.77	40.27	1621.673
2015	591.6	2016	413	-43.24	-54.74	2996.468
2016	413	2017	515	19.8	8.3	68.89
2017	515	2018	505	-1.98	-13.48	181.7104
2018	505	2019	733.4	31.14	19.64	385.7296
				57.5		5254.471

$\Sigma R = 2315.5968, \bar{R} = 463.0994$

Standard deviation = $\sqrt{(\Sigma(R-\bar{R})^2) / n} = \sqrt{5254.471 / 5} = \sqrt{1050.8942} = 32.4172$

Interpretation: The Sharpe ratio is 0.15 for 5 stocks

Table 7

Calculation of Beta (β)

Year	Market Returns(x)	(x- \bar{x})	(x- \bar{x}) ²	Security Returns(y)	(y- \bar{y})	(y- \bar{y}) ²	(x- \bar{x})(y- \bar{y})
2014-2015	24.96	15.976	255.1687	51.77	40.27	1621.673	643.3535
2015-2016	-15.67	-24.656	607.9183	-43.24	-54.74	2996.468	1349.669
2016-2017	15.62	6.635	44.00996	19.8	8.3	68.89	55.0705
2017-2018	12.84	3.854	14.85332	-1.98	-13.48	181.7104	-51.9519
2018-2019	7.18	-1.806	3.261636	31.14	19.64	385.7296	-35.4698
	$\Sigma X = 44.93$		$\Sigma X^2 = 925.2616$	$\Sigma Y = 67.61$		$\Sigma Y^2 = 5254.471$	$\Sigma XY = 1960.672$
	$\bar{X} = 8.986$			$\bar{Y} = 13.522$			

Beta (β) = CO-Variance/Variance = $\Sigma(x-\bar{x})(y-\bar{y}) / \Sigma(x-\bar{x})^2 = 1960.672 / 925.2616 = 2.11$

Sharpe Ratio: $S.R. = \bar{R}_p - R_f / SD$

Average Return = 11.5

Standard Deviation = 32.4172

Risk free = 6.3299

Calculation: $S.R. = 11.5 - 6.3299 / 32.4172 = 0.15$

Interpretation: The Sharpe ratio is 0.15 for 5 stocks

3. SBI BANK

Table 8

Calculation of Rate of Return

Rate of return = (closing price - opening price) / closing price × 100

Opening year	Opening Price	Closing Year	Closing Price	Returns
2014	169.22	2015	290.65	41.77877
2015	290.65	2016	183.4	-58.4787
2016	183.4	2017	296.9	38.2283
2017	269.9	2018	253.25	-6.5745
2018	253.25	2019	281.2	9.939545
				$\Sigma R = 24.89342$
				$\bar{R} = 4.97$

$\Sigma R = 830.2612, \bar{R} = \Sigma R / n = 24.89342 / 5 = 4.97$

Interpretation: Average rate of return per year for 5 years is $\bar{R} = 4.97$

Table 9
Calculation of Standard Deviation

Opening Year	Opening Price	Closing Year	Closing Price	Returns	(R- \bar{R})	(R- \bar{R}) ²
2014	169.22	2015	290.65	41.77877	36.8001	1354.253
2015	290.65	2016	183.4	-58.4787	-63.4573	4026.829
2016	183.4	2017	296.9	38.2283	33.2497	1105.543
2017	269.9	2018	253.25	-6.5745	-11.5531	133.4741
2018	253.25	2019	281.2	9.939545	4.96094	24.61098
				$\Sigma R = 24.892$		$\Sigma(R-\bar{R})^2 = 6644.709$
				$\bar{R} = 4.97$		$\Sigma(R-\bar{R})^2 / n = 1328.94$

$\Sigma R = 830.2612, \bar{R} = \Sigma R / n = 830.2612 / 5 = 166.05$

Standard deviation = $\sqrt{(\Sigma(R-\bar{R})^2) / n} = \sqrt{6644.709 / 5} = \sqrt{1328.94} = 36.45$

Table 10

Beta Calculation for SBI bank

Year	Market returns(x)	(x- \bar{x})	(x- \bar{x}) ²	Security returns(y)	(y- \bar{y})	(y- \bar{y}) ²	(x- \bar{x})(y- \bar{y})
2014-2015	24.96	15.976	255.1687	41.77877	36.80017	1354.253	587.9195
2015-2016	-15.67	-24.656	607.9183	-58.4787	-63.4573	4026.829	1564.603
2016-2017	15.62	6.635	44.00996	38.2283	33.2497	1105.543	220.6118
2017-2018	12.84	3.854	14.85332	-6.5745	-11.5531	133.4741	-44.5256
2018-2019	7.18	-1.806	3.261636	9.939545	4.960945	24.61098	-8.95947
						$\Sigma(R-\bar{R})^2 = 6644.709$	$\Sigma(x-\bar{x})(y-\bar{y}) = 2319.649$
						$\Sigma(R-\bar{R})^2 / n = 1328.94$	
	8.986		925.2616	$\bar{R} = 4.97$			

Beta (β) = CO-Variance/Variance = $\Sigma(x-\bar{x})(y-\bar{y}) / \Sigma(x-\bar{x})^2 = 2319.649 / 925.2616 = 2.50$

Sharpe Ratio: $S.R. = \bar{R}_p - R_f / SD$

Average return = 4.97

Standard deviation = 36.45

Risk free = 6.3299

Calculation:

$S.R. = 4.97 - 6.3299 / 36.45$

S.R = -0.03

Interpretation: The Sharpe Ratio is -0.03 for 5 stocks

4. HDFC BANK

Table 11

Calculation of Rate of Return

Rate of return = (closing price-opening price) ÷ closing price × 100

Opening Year	Opening Price	Closing year	Closing Price	Returns
2014	734.45	2015	1052.55	30.22184
2015	1052.55	2016	1021.25	-3.06487
2016	1021.25	2017	1400.1	27.05878
2017	1400.1	2018	1851.05	24.3618
2018	1851.05	2019	2128.2	13.02274
				91.60029
				$\bar{R} = 18.32$

$\Sigma R = 91.60029$, $\bar{R} = \Sigma R/n = 91.60029/5 = 18.32$

Interpretation: Average rate of return per year for 5 years is $\bar{R} = 18.32$

Table 12

Standard deviation calculated for HDFC BANK

Opening Year	Opening Price	Closing Year	Closing Price	Returns	(R- \bar{R})	(R- \bar{R}) ²
2014	734.45	2015	1052.55	30.22184	30.22184	913.35
2015	1052.55	2016	1021.25	-3.06487	-3.06487	9.3934
2016	1021.25	2017	1400.1	27.05878	27.05878	732.17
2017	1400.1	2018	1851.05	24.3618	24.3618	593.45
2018	1851.05	2019	2128.2	13.02274	13.02274	169.55
				91.60029		$\Sigma(R-\bar{R})^2 = 2418$
						$\Sigma(R-\bar{R})^2/n = 483.6$

$\Sigma R = 91.60029$, $\bar{R} = \Sigma R/n = 91.60029/5 = 18.32$

Standard Deviation = $\sqrt{\Sigma(R-\bar{R})^2/n} = \sqrt{2418.02/5} = \sqrt{483.604} = 21.9$

Table 13

Beta Calculation for HDFC Bank

Year	Market returns(x)	(x- \bar{x})	(x- \bar{x}) ²	Security returns(y)	(y- \bar{y})	(y- \bar{y}) ²	(x- \bar{x})(y- \bar{y})
2014-2015	24.96	15.976	255.1687	30.22184	30.22184	913.3596	482.8241
2015-2016	-15.67	-24.656	607.9183	-3.06487	-3.06487	9.393428	75.56743
2016-2017	15.62	6.635	44.00996	27.05878	27.05878	732.1776	179.535
2017-2018	12.84	3.854	14.85332	24.3618	24.3618	593.4973	93.89038
2018-2019	7.18	-1.806	3.261636	13.02274	13.02274	169.5918	-23.5191
				91.60029		2418.02	808.2979
	8.986		925.2616				

Beta (β) = CO-variance/variance = $\Sigma(x-\bar{x})(y-\bar{y})/\Sigma(x-\bar{x})^2 = 808.2979/925.2616 = 0.873$

Sharpe Ratio: S.R = $\bar{R}_p - R_f / SD$

Average Return = 18.32

Standard Deviation = 21.9

Risk free = 6.3299

Calculation:

S.R = $18.32 - 6.3299 / 21.9$

S.R = 0.5

Interpretation: The Sharpe ratio is 0.5 for 5 stocks

5. KOTAK MAHINDRA BANK

Table 14

Calculation of Rate of Return

Rate of return = (closing price-opening price) ÷ closing price × 100

Opening Year	Opening price	Closing Year	Closing Price	Returns
2014	376.2	2015	673.9	44.1756
2015	673.9	2016	654.6	-2.9483
2016	654.6	2017	828.9	21.0278
2017	828.9	2018	1082.45	23.4237
2018	1082.45	2019	1238.9	12.6281
				$\Sigma R = 98.3069$
				$\bar{R} = 19.66$

$\Sigma R = 98.3069$, $\bar{R} = \Sigma R/n = 98.3069/5 = 19.66$

Interpretation: Average rate of return per year for 5 years is $\bar{R} = 19.66$

Table 15

Calculation of Standard Deviation

Opening Year	Opening Price	Closing Year	Closing Price	Returns	(R- \bar{R})	(R- \bar{R}) ²
2014	376.2	2015	673.9	44.1756	24.5156	601.0146
2015	673.9	2016	654.6	-2.9483	-22.6083	511.1352
2016	654.6	2017	828.9	21.0278	1.3678	1.870877
2017	828.9	2018	1082.45	23.4237	3.7637	14.16544

2018	1082.45	2019	1238.9	12.6281	-7.0319	49.44762
				$\Sigma R = 98.3069$		$\Sigma(R-\bar{R})^2 = 1177.634$
				$\bar{R} = 19.66$		$\Sigma(R-\bar{R})^2/n = 235.5268$

$\Sigma R = 98.3069$, $\bar{R} = \Sigma R/n = 98.3069/5 = 19.66$

Standard Deviation = $\sqrt{\frac{\Sigma(R-\bar{R})^2}{n}} = \sqrt{1177.634/5} = \sqrt{235.5268} = 15.34$

Table 16

Beta Calculation for Kotak Mahindra Bank

Year	Market return(x)	(x- \bar{x})	(x- \bar{x}) ²	Security returns(y)	(y- \bar{y})	(y- \bar{y}) ²	(x- \bar{x})(y- \bar{y})
2014-2015	24.96	15.976	255.1687	44.1756	24.5156	601.0146	391.6612
2015-2016	-15.67	-24.656	607.9183	-2.9483	-22.6083	511.1352	557.4302
2016-2017	15.62	6.635	44.00996	21.0278	1.3678	1.870877	9.075353
2017-2018	12.84	3.854	14.85332	23.4237	3.7637	14.16544	14.5053
2018-2019	7.18	-1.806	3.261636	12.6281	-7.0319	49.44762	12.69961
				$\Sigma R = 98.3069$		$\Sigma(R-\bar{R})^2 = 1177.634$	$\Sigma(x-\bar{x})(y-\bar{y}) = 985.3717$
				$\bar{R} = 19.66$		$\Sigma(R-\bar{R})^2/n = 235.5268$	
	8.986		925.2616				

Beta (β) = CO-variance/Variance = $\Sigma(x-\bar{x})(y-\bar{y})/\Sigma(x-\bar{x})^2 = 985.3717/925.2616 = 1.06$

Sharpe Ratio = $\bar{R}_p - R_f / SD$

Average return = 19.66

Standard deviation = 15.34

Risk free = 6.3299

Calculation: S.R = $19.66 - 6.3299 / 15.34 = 0.86$

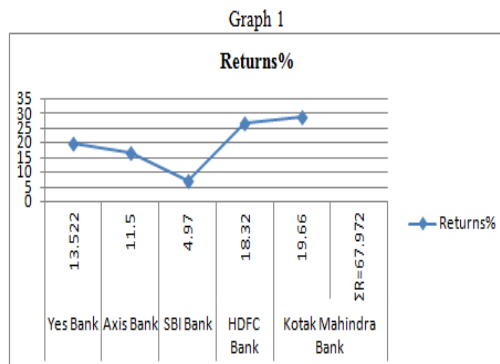
Interpretation: The Sharpe ratio is 0.86 for 5 stocks

Table 17

Calculation of Rate of Return for Portfolio 1

Stocks	Returns	Returns%
Yes Bank	13.522	19.89348555
Axis Bank	11.5	16.91873124
SBI Bank	4.97	7.311834285
HDFC Bank	18.32	26.95227447
Kotak Mahindra Bank	19.66	28.92367445
	$\Sigma R = 67.972$	

Calculation: Average rate of return = $\Sigma R / N = 67.972 / 5 = 13.59$



Interpretation: The average returns of portfolio 1 are 13.59 for 5 stocks, and better is gained by Kotak Mahindra Bank 29%.

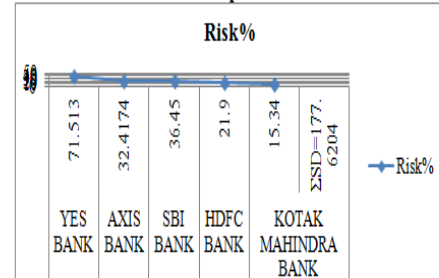
Table 18

Calculation of Standard Deviation for Portfolio 2

Stocks	Standard Deviation	Risk%
YES BANK	71.513	40.2617042
AXIS BANK	32.4174	18.2509441
SBIBANK	36.45	20.5212915
HDFC BANK	21.9	12.3296648
KOTAK MAHINDRA BANK	15.34	8.63639537
	$\Sigma SD = 177.6204$	

Calculation: Average rate SD IS = $177.6204 / 5 = 35.5240$

Graph 2



Interpretation: The average rate of standard deviation is 35.52 for 5 stocks and the highest risk facing stock is YES Bank (40%).

Table 19

Calculation of Beta (β) for Portfolio 3

Stocks	Beta(β)	Ranks
YES Bank	1.45	3
AXIS Bank	2.11	4
SBI Bank	2.50	5
HDFC Bank	1.0	1
Kotak Mahindra Bank	1.06	2

Interpretation: The average rate of Beta is referee for ranks for 5 stocks in HDFC & KOTAK Mahindra Bank are gained better rank.

Graph 3

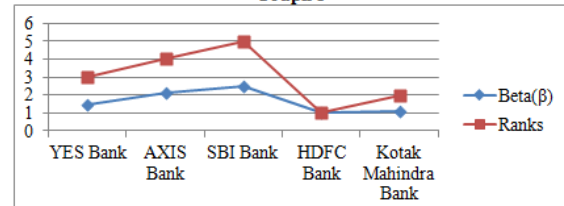
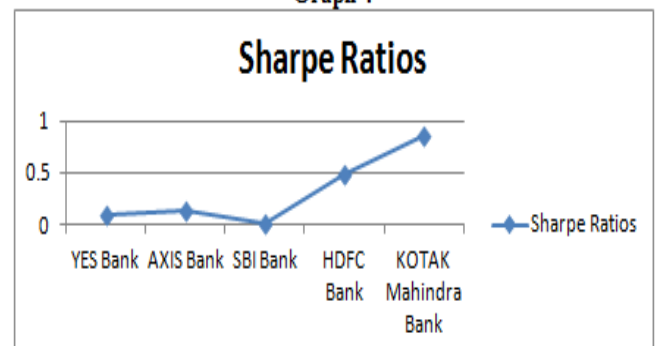


Table 20

Calculation of Sharpe Ratio Portfolio 4

Stocks	Sharpe Ratios
YES Bank	0.1
AXIS Bank	0.15
SBI Bank	0.03
HDFC Bank	0.5
KOTAK Mahindra Bank	0.86

Graph 4



Interpretation: The overall Sharpe ratio's of portfolio-4 is comparing selected stocks high risk and return bereaved the KOTAK Mahindra Bank. From the above information Kotak Mahindra Bank is the highest return and followed by YES Bank, AXIS Bank, SBI Bank and HDFC Bank. In the KOTAK Mahindra Bank highest deviation in the order, KOTAK Mahindra Bank highest systematic risk and YES Bank also because gained high return and also facing highest risk.

5. Findings

- It is definitely possible to construct an optimal portfolio using NIFTY 50 companies enlisted on NSE
- Companies move negatively with the market return as their average return is negative response.
- The Kotak Mahindra Bank has generated high percentage of return 29% among 5 stocks.
- The other 4 stocks shares suffering from losses and also not consistent in profits, investors are advised to buy and hold the Kotak Mahindra Bank equity shares.
- The YES Bank has facing high percentage of risk 40%.
- The excess beta is also determined with the ranks associated with e changes or the residual variance which affects the portfolio
- The companies with better portfolio weight are also determined through the cut-off rate.
- The performance of the stock is shown through the excess return to beta ratio and helps to exterminate those companies which are not efficient.
- For the complete 5 years of data determined the risk associated with its stock is not the

same as it differs day to day, time to time, month to month etc...

6. Suggestions

- The volatility or the fluctuations in the stock keep changing in the stocks along with their beta and variance. So eventually the investors have to observe constantly about the market.
- Stocks with relatively lower beta and higher returns have to be chosen to make investment.
- The investors can invest in Kotak Mahindra as the high returns and lower beta value and handle the risk.
- The optimal portfolio is a subject to change, because the proportion of investment changes in each security from time to time.
- Regular analysis or changes in the market has to be done as it would benefit and also minimize the consequences of incurring losses.
- Continuous evaluation of stock is necessary and the portfolio has to be updated periodically to overcome the changes.
- The awareness of the utility of securities screening the optimal portfolio construction must be made use of the investor.
- It is highly recommended or assured to invest in these 4 stocks to get a good return at the lowest possible risk and this can be repeated or has to be maintained as an ongoing exercise.
- The changes in the market can keep an investor or decision to be made against the securities based on their portfolio weights.

- Thus the study leads to understand the concept of optimal portfolio management model through analyzing the performance of the portfolio of the organizations by using Sharpe's single index model and it helps to investigate the unpredictability of different organizations stocks regarding examination with the business sector.
- The investors who take less risk with minimum returns they can go to the portfolio 1.
- The investors who take high risk with maximum returns they can go to the portfolio

7. Conclusion

The study risk return investigation helps the investor to pick up the securities based on his choice. The study of this kind provides information about the performance of various securities in the market in terms of risk and return. The study can be concluded for testing the utility of Sharpe's single index model which is conducted and as per the objective; here the portfolio is constructed with 35 selected companies out of 50 companies enlisted on NSE and it also reports the investor to decide whether he has to buy or not. This method used in the study of optimal portfolio is very effective and feasible as revision of the optimal portfolio has to be done continuously as an ongoing exercise to determine the very outcome of the market and the changes in the portfolio can be determined. The use of cut-off point describes that those securities above the cut-off point included also provides a rational outcome in returns which can be invested. The excess beta ratio also plays a major role in eliminating those companies which is not efficient for the study. Thus the construction

of optimal portfolio for the long run is suited and is found very useful in determining the causes and changes of various stocks enlisted along with the changes or volatility in the market and it also throws light on the factors that are to be considered while investing in the capital market. Thus the study concluded that portfolio 2 has high standard deviation and high returns so, that portfolio 2 is best to invest and portfolio 1 is suitable to investors who bear minimum risk.

8. References

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