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Risk and Return Analysis of SelectedSecurities in Kotak Securities PvtLimited, Hyderabad

Ch. Akshaya[1], Dr. S. Narender[2]

[1]II MBA, Department of MBA, Malla Reddy Engineering College (Autonomous) Hyderabad, Email: akshayareddy8125@gmail.com
[2]Professor, Department of MBA, Malla Reddy Engineering College [Autonomous] Hyderabad, Email: narendercommerce@gmail.com
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ABSTRACT

This study focuses on the risk and return analysis of selected securities offered by Kotak Securities in Hyderabad, focusing on the application of the Markowitz model. The primary objective is to construct optimal portfolios that balance risk and return through rigorous analysis of individual securities' correlations, standard deviations, and optimal asset allocations. The research aims to understand the investment patterns of Kotak Securities and assess the associated risks and returns. By utilizing quantitative techniques, including correlation analysis and standard deviation calculations, the study identifies how to allocate funds effectively among different securities to achieve optimal portfolio performance. Furthermore, the study compares the risk of the constructed portfolios against the individual risks of the constituent securities to ascertain whether portfolio diversification effectively reduces overall risk. It also evaluates the consistency and adequacy of returns generated by the selected portfolios to determine their suitability for investors. Ultimately, this research contributes to enhancing decision-making in portfolio management by providing insights into constructing portfolios that offer optimal returns relative to the risk undertaken, thereby aiding investors in making informed investment choices.

KEYWORDS: *Risk Management, Portfolio Diversification, Decision Making, Investment.*

1. INTRODUCTION

Risk-Return Analysis opens the door to a groundbreaking four-book series giving readers a privileged look at the personal reflections and current strategies of a luminary in finance. This first volume is Markowitz's response to what he calls the "Great Confusion" that spread when investors lost faith in the diversification benefits of MPT during the financial crisis of 2008. It demonstrates why MPT never became ineffective during the crisis, and how you can continue to reap the rewards of managed diversification into the future. Economists and financial advisors will benefit from the potent balance of theory and hard data on mean-variance analysis aimed at improving decision-making skills.

Investors are risk averse; i.e., given the same expected return, they will choose the investment for which that return is more certain. Therefore, investors demand a higher expected return for riskier assets. Note that a higher expected return does not guarantee a higher realized return. Because by definition returns on risky assets are uncertain, an investment may not earn its expected return. Although the charts in Figure 1 show historical (realized) returns rather than expected (future) returns, they are useful to demonstrate the relationship between risk and return. Note that the mean (average) annual return increases as the dispersion of returns increases. A portfolio is a collection of assets. The assets may be physical or financial like Shares, Bonds, Debentures, Preference Shares, etc.

2. NEED OF THE STUDY

A risk-Return analysis has emerged as a separate academic discipline in India. Portfolio theory that deals with the rational investment decision-making process has now become an integral part of financial literature. Investing in securities such as shares, debentures & bonds is profitable well as exciting. It is indeed rewarding but involves a great deal of risk & need artistic skill. Investing in financial securities is now considered to be one of the most risky avenues of investment. It is rare to find investors investing their entire savings in a single security. Instead, they tend to invest in a group of securities

3. SCOPE OF THE STUDY

This study covers the Markowitz model. The study covers the calculation of correlations between the different securities in order to find out at what percentage funds should be invested among the companies in the portfolio. Also the study includes the calculation of individual Standard Deviation of

securities and ends at the calculation of weights of individual securities involved in the portfolio. These percentages help in allocating the funds available for investment based on risky portfolios.

4. OBJECTIVES OF THE STUDY

- To identify and select a diversified portfolio of securities offered by Kotak Securities for detailed risk and return analysis.
- To assess and quantify the inherent risks associated with each selected security, including market risk, liquidity risk, and specific company risks.
- To analyze historical returns and performance metrics (e.g., annualized return, volatility) of the selected securities to understand their profitability and performance relative to benchmarks.
- To conduct a comparative analysis of risk-adjusted returns across the selected securities to identify outliers and top performers.

5. REVIEW OF LITERATURE

Dr. P. Subramanyam, and Dr.NallaBala Kalyan. (2018) observed that reforms of public sector and reforms of financial sector, the economy has been opened up and many developments have been taking place in the Indian money market and Capital market. **Chandana et. al (2018)**examined that provides an opportunity to gain relevant knowledge and skills prior to starting out in a particular career field to understand the business operations being performed by the companies. **PM Muiruri (2014)** sought that to investigate the effects of estimating of Systematic risk in equity stocks of the various sectors of the Nairobi Securities Exchange (NSE. The study will be of benefit to both policy makers and investors to identify thespecific factors affecting stock prices. To the investors it will provide useful and adequateinformation an understanding on the relationship between risk and return as a key piece in building ones investment philosophy. **DM Mwaniki (2015)**concluded that establish the relationship between risk and return of stocks listed at the Nairobi Securities Exchange during the period 1st January 2009 to 6th June 2014. The research findings revealed the existence of a statistically significant weak negative relationship between risk and return for stocks listed on the Nairobi Securities Exchange. These findings go against the fundamentals of finance that the higher the risk the higher the return.

6. RESEARCH METHODOLOGY

Secondary collection methods:

The secondary collection methods includes the lectures of the superintend of the department of market operations and so on., also the data collected from the news, magazines and different books issues of this study Superintend.

Period of the study: The study covered period of 5 years i.e from 2018-19 to 2022-23.

7.LIMITATIONS OF THE STUDY

- Construction of Portfolio is restricted to two companies based on Markowitz model.
- Very few and randomly selected scripts / companies are analyzed from BSE listings.
- Data collection was strictly confined to secondary source. No primary data is associated with the project.
- Detailed study of the topic was not possible due to limited size of the project.
- There was a constraint with regard to time allocation for the research study i.e. for a period of two months.

8. DATA ANALYSIS AND INTERPRETATION

CALCULATION OF RETURN OF CIPLA

Year	**Beginning price (Rs)**	**Ending price (Rs)**	**Dividend (Rs)**
2018-2019	898.00	1771.05	10.00
2019-2020	1734.00	321.8	3.00
2020-2021	320.00	448	3.50

2021-2022	447.95	251.35	2.00
2022-2023	251.5	216.65	2.00

$$Return = \frac{Dividend + (Ending\ Price - Beginning\ Price)}{Beginning\ Price} * 100$$

Return (2019) = $\frac{10.00+(1775.05-898.00)}{898.00} * 100$ = 54.23%

Return (2020) = $\frac{3.00+(321.8-1734.00)}{1734} * 100$ = -75.95%

Return (2021) = $\frac{3.50+(448-320.00)}{320} * 100$ = 41.09%

Return (2022) = $\frac{2.00+(251.35-447.95)}{447.95} * 100$ = -43.44%

Return (2023) = $\frac{2.00+(216.65-251.5)}{251.5} * 100$ = -18.65%

Interpretation

The above return for the company CIPLA for the year 2019 and 2021 is 54.23% and 41.09% which has a positive impact on return and for 2020, 2022, and 2023 has a negative impact on returns

CALCULATION OF RETURN OF RANBAXY

Year	**Beginning price(Rs)**	**Ending price(Rs)**	**Dividend(Rs)**
2018-2019	598.45	1095.25	19.00
2019-2020	1109.00	1651.19	21.00
2020-2021	1668	362.75	18.50
2021-2022	363	391.8	8.50
2022-2023	391	425.5	8.50

$$Return = \frac{Dividend + (Ending\ Price - Beginning\ Price)}{Beginning\ Price} * 100$$

Return (2019) = $\frac{19.00+(1095.25-598.45)}{598.45} * 100$ = 85.52%

Return (2020) = $\frac{21.00+(1651.19-1109.00)}{1109} * 100$ = 18.35%

Return (2021) = $\frac{4.50+(362.75-1668.00)}{1668.00} * 100$ = -70.24%

Return (2022) = $\frac{8.50+(391.8-363)}{363} * 100$ = 10.27%

Return (2023) = $\frac{8.50+(425.5-391.00)}{391.00} * 100 = 10.99\%$

Interpretation

The above return of the company RANBAXY for the year 2019,2020,2022 and 2023 has a positive impact on returns and in the year 2021 has a -70.24% negative impact on returns.

CALCULATION OF RETURN OF MAHENDRA & MAHENDRA

Year	Beginning price (Rs.)	Ending price (Rs.)	Dividend (Rs.)
2018-2019	117.45	388.8	5.50
2019-2020	392.55	545.45	9.00
2020-2021	547.10	511.6	17.00
2021-2022	518.80	908.45	10.00
2022-2023	917.00	861.95	11.50

$$Return = \frac{Dividend + (Ending\,Price - Beginning\,Price)}{Beginning\,Price} * 100$$

Return (2019) = $\frac{5.50+(388.8-117.45)}{117.45} * 100 = 247.55\%$

Return (2020) = $\frac{9.00+(545.45-392.55)}{392.55} * 100 = 41.24\%$

Return (2021) = $\frac{17.00+(511.6-547.10)}{547.10} * 100 = -4.11\%$

Return (2022) = $\frac{10.00+(908.45-518.80)}{518.50} * 100 = 78.41\%$

Return (2023) = $\frac{11.50+(861.95-917.00)}{917.00} * 100 = -4.3\%$

Interpretation:

The above return of the company MAHENDRA for year 2019,2020 and 2022 has a positive impact on the returns. It shows negative impact in the year 2021 and 2023.

CALCULATION OF RETURN OF BAJAJ AUTO

Year	Beginning price (Rs)	Ending price (Rs)	Dividend (Rs)
2018-2019	502	1176.3	18.00
2019-2020	1165.05	1171.2	25.00
2020-2021	1189.00	2001.1	25.00
2021-2022	2022.00	2619.19	40.00

2022-2023	2648.65	2627.9	40.00

$$Return = \frac{Dividend + (Ending\,Price - Beginning\,Price)}{Beginning\,Price} * 100$$

Return (2019) = 18.00+(1176.3 -502) * 100 = 169.18%

502

Return (2020) = 25.00+(1171.2-1165.05)* 100 = 2.77%

1165.05

Return (2021) = 25.00+(2001.1-1189.00) * 100 = -76.34%

1189.00

Return (2022) = 40.00+(2619.19-2022.00)* 100 = 31.9%

2022.00

Return (2023) = 40.00+(2627.9-2648.65)* 100 = 0.726%

2648.65

Interpretation:

The returns of Bajaj auto ltd for the year 2019, 2020, 2022 and 2023 shows positive returns. And return of 2021 shows negative return.

CALCULATION OF STANDARD DEVIATION OF CIPLA

Year	Return (R)	$\overline{R}$	$R - \overline{R}$	$\left(R - \overline{R}\right)^2$
2018-2019	54.23	-7.744	61.974	3840
2019-2020	-75.95	-7.744	-68.206	4652
2020-2021	41.09	-7.744	48.834	2384
2021-2022	-43.44	-7.744	-35.696	1674
2022-2023	-18.65	-7.744	-6.906	47.692
	-38.72			16197.692

$$\text{Average Return} = \frac{\Sigma \overline{R}}{N}$$ N= number of years

$$= \frac{-38.72}{5} = -7.744$$

$$\text{Variance} = \frac{1}{N-1}\Sigma\left(R - \overline{R}\right)^2$$

$$Standard\,Deviation = \sqrt{Variance} = \sqrt{\frac{1}{N-1}\Sigma\left(R - \overline{R}\right)^2}$$

$$= \sqrt{\frac{1}{5-1}(12197.692)}$$

= **55.22**

Interpretation:

The above table represents the standard deviation of return of CIPLA from the calculations returns is -7.744 and standard deviation is 55.2.

CALCULATION OF STANDARD DEVIATION OF RANBAXY

Year	Return (R)	$\overline{R}$	$R-\overline{R}$	$\left(R-\overline{R}\right)^2$
2018-2019	85.52	10.21	75.34	5676
2019-2020	18.35	10.21	4.21	21.39
2020-2021	-70.24	10.21	-80.42	6467
2021-2022	10.27	10.21	0.09	0.0081
2022-2023	10.99	10.21	0.81	0.6561
	50.89			16201

$$\text{Average Return} = \frac{\Sigma\overline{R}}{N}$$ N= number of years

$$= \frac{50.89}{5} = 10.18$$

$$\text{Variance} = \frac{1}{N-1}\Sigma\left(R-\overline{R}\right)^2$$

$$Standard\ Deviation = \sqrt{Variance} = \sqrt{\frac{1}{N-1}\Sigma\left(R-\overline{R}\right)^2}$$

$$= \sqrt{\frac{1}{5-1}(12161)}$$

= 55.17

Interpretation:

The above table represents the standard deviation of returns of RANBAXY from the calculations average returns is 10.21% and standard deviation is 55.16%

Calculation of standard deviation of MAHENDRA&MAHENDRA

Year	Return (R)	$\overline{R}$	$R-\overline{R}$	$\left(R-\overline{R}\right)^2$
2018-2019	247.45	71.758	218.79	30902.8
2019-2020	41.24	71.758	-30.52	931.47
2020-2021	-4.11	71.758	-75.868	5755.95
2021-2022	78.41	71.758	6.652	44.25
2022-2023	-4.3	71.758	-76.058	5784.82

	358.79			43419.3

$$\text{Average Return} = \frac{\Sigma \overline{R}}{N}$$ N= number of years

$$= \frac{358.79}{5} = 71.758$$

$$\text{Variance} = \frac{1}{N-1}\Sigma\left(R-\overline{R}\right)^2$$

$$S\tan dard\ Deviation = \sqrt{Variance} = \sqrt{\frac{1}{N-1}\Sigma\left(R-\overline{R}\right)^2}$$

$$= \sqrt{\frac{1}{5-1}(43419.3)}$$

= 104.219

Interpretation:

The above table represents the standard deviation of MAHENDRA&Mahendra from the calculations average returns is 71.58% and standard deviation is 104.219

CALCULATION OF STANDARD DEVIATION OF BAJAJAUTO

Year	Return (R)	$\overline{R}$	$R-\overline{R}$	$\left(R-\overline{R}\right)^2$
2018-2019	169.18	48.218	80.965	6555.3
2019-2020	2.77	48.218	-45.405	2061.6
2020-2021	76.34	48.218	28.205	793.3
2021-2022	31.9	48.218	-20.275	264.9
2022-2023	0.726	48.218	-47.449	2251.4
	240.876			11926.5

$$\text{Average Return} = \frac{\Sigma \overline{R}}{N}$$ N= number of years

$$= \frac{240.876}{5} = 48.175$$

$$\text{Variance} = \frac{1}{N-1}\Sigma\left(R-\overline{R}\right)^2$$

$$S\tan dard\ Deviation = \sqrt{Variance} = \sqrt{\frac{1}{N-1}\Sigma\left(R-\overline{R}\right)^2}$$

$$= \sqrt{\frac{1}{5-1}(11926.5)}$$

= **54.6**

Interpretation:

The above table represents the standard deviation of BAJAJ AUTO LTD from the calculation average returns is 48.205% and standard deviation is 54.6%

CORRELATION BETWEEN CIPLA & RANBAXI

Year	DEVIATION OF CIPLA (R_{CIPLA} - $\overline{R}_{CIPLA}$)	DEVIATION OF RANBAXI (R_{RBX}- $\overline{R}_{RBX}$)	COMBINED DEVIATION (R_{CIPLA} - $\overline{R}_{CIPLA}$) (R_{RBX}- $\overline{R}_{RBX}$)
2018-2019	61.974	75.34	4669.16
2019-2020	-68.206	4.21	-284.42
2020-2021	48.834	-80.42	-3927.23
2021-2022	-35.696	0.09	-3.217
2022-2023	-6.906	0.81	-5.59
			448.667

Covariance of CIPLA& RANBAXI = $\frac{1}{N}\sum (R_{CIPLA} - \overline{R}_{CIPLA})(R_{RBX} - \overline{R}_{RBX})$

$$= \frac{1}{5}(448.667)$$

= 89.7334

Correlation – Coefficient CIPLA& RANBAXI =

$$\rho_{CIPLA,\ RBX} = \frac{COV_{CIPLA,RBX}}{[\sigma_{CIPLA}][\sigma_{RBX}]}$$

$$= \frac{89.7334}{(55.22)(55.13)}$$

= 0.0295

Interpretation:

The above table represents the calculation of correlation between CIPLA & RANBAXY. There is a positive correlation between the two companies i.e0.0295.

CORRELATION BETWEEN BAJAJ AUTO AND M& M

Year	Deviation of Bajaj Auto (R_{BJ} - $\overline{R}_{BJ}$)	Deviation Of Mahendra&Mahendra ($R_{M\&M}$ - $\overline{R}_{M\&M}$)	COMBINED DEVIATION (R_{BJ} - $\overline{R}_{BJ}$) ($R_{M\&M}$ - $\overline{R}_{M\&M}$)
2018-2019	80.965	218.79	18232.84
2019-2020	-45.405	-30.52	1785.76

2020-2021	28.205	-75.868	-1909.22
2021-2022	-20.275	6.652	-108.26
2022-2023	-47.449	-76.058	3608.87
			21210

Covariance of Bajaj Auto and Mahindra & Mahindra =

$$\frac{1}{N}\sum (R_{BJ} - \overline{R}_{BJ})(R_{M\&M} - \overline{R}_{M\&M})$$

$$= \frac{1}{5}(17210)$$

= 3442

Correlation – Coefficient Bajaj Auto and Mahindra & Mahindra =

$$\rho_{BJ,\ M\&M} = \frac{COV_{BJ,M\&M}}{[\sigma_{BJ}][\sigma_{M\&M}]}$$

$$= \frac{3442}{(54.60)(104.586)}$$

= 0.605

Interpretation:

The above table represents the calculation of correlation between BAJAJ and MAHENDRA & MAHENDRA there is a positive correlation between the two companies i.e 0.605.

CORRELATION BETWEEN CIPLA&BAJAJ

Year	DEVIATION OF CIPLA (R_{CIPLA}- $\overline{R}_{CIPLA}$)	DEVIATION OF BAJAJ (R_{BJ} - $\overline{R}_{BJ}$)	COMBINED DEVIATION (R_{CIPLA}- $\overline{R}_{CIPLA}$) (R_{BJ} - $\overline{R}_{BJ}$)
2018-2019	61.974	80.965	5021.72
2019-2020	-68.206	-45.405	3096.90
2020-2021	48.834	28.205	1775.41
2021-2022	-35.696	-20.275	580.95
2022-2023	-6.906	-47.449	327.68
			10398.70

Covariance of CIPLA& BAJAJ=

$$\frac{1}{N}\sum (R_{CIPLA} - \overline{R}_{CIPLA})(R_{BJ} - \overline{R}_{BJ})$$

$$= \frac{1}{5}(10398.70)$$

= 2079.74

Correlation – Coefficient CIPLA& BAJAJ =

$$\rho_{CIPLA,\ BJ} = \frac{COV_{CIPLA,BJ}}{[\sigma_{CIPLA}][\sigma_{BJ}]}$$

$$= \frac{2079.74}{(55.22)(54.60)}$$

= 0.690

Interpretation:

The above table represents the calculation of correlation between CIPLA & BAJAJ. There is a positive correlation between the two companies i.e 0.690.

8. FINDINGS:

- The combination of CIPLA and RANBAXY gives the proportion of investment is 0.49920 and 0.50084 for CIPLA and RANBAXY, based on the standard deviations The standard deviation for CIPLA is 55.22 and for RANBAXY is 55.17. When compared to both the risk is almost same, hence the risk is same when invested in either of the security.
- The combination of M&M and BAJAJ AUTO gives the proportion of investment is 1.6206 and 0.6206 for M&M and BAJAJ AUTO, based on the standard deviations The standard deviation for M&M is 104. 219 and for BAJAJ AUTO is 54.6.
- Hence the investor should invest their funds more in BAJAJ AUTO when compared to M&M as the risk involved in BAJAJ AUTO is less than M&M as the standard deviation of BAJAJ AUTO is less than that of M&M.

9. SUGGESTIONS

- Investor would be able to achieve when the returns of shares and debentures Resultant portfolio would be known as diversified portfolio. Thus portfolio construction would address itself to three major via. Selectivity, timing and diversification.
- In case of portfolio management, negatively correlated assets are most profitable. Correlation between the BAJAJ are negatively correlated which means both the combinations of portfolios are at good position to gain in future.
- Investors may invest their money for long run, as both the combinations are most suitable portfolios. A rational investor would constantly examine his chosen portfolio both for average return and risk.

10. CONCLUSION

Portfolio management is believed to be the leading strategy in the success of the modern companies. Adopting these strategies as discussed above enables the company to provide confidence to stakeholders (shareholders, customers, employees, and suppliers). . Additionally, embracing technology helps the company to lower down the cost of running the projects as well as improving reducing the payback period. In an effort to improve portfolio management, the company should embrace a culture of promoting the management of the portfolio by ensuring that the process is deeply rooted throughout the company.

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