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A STUDY ON RISK MANAGEMENT IN EQUITIES

[1]Kanithi Lokesh [2]Dr. Aruna Gudimetla

[1]II MBA – MLR Institute of Technology, Hyderabad.E-mail: kanithilokesh2506@gmail.com

[2]Associate Professor, Department of MBA, MLR Institute of Technology,Hyderabad

E-mail: draruna.gudimetla@mlrinstitutions.ac.in

ABSTRACT

This research dives into the subject of diverse investment portfolio construction by analysing several stock pairings from companies including Bajaj Auto, Cipla, Ranbaxy, and Wipro. The primary objective is to determine the relationship between standard deviation (a measure of risk) and the percentage of investment in each stock. The analysis concludes that, compared to Wipro, Cipla is a safer investment choice. Ranbaxy and Cipla, on the other hand, carry nearly identical risks; so, you might do well with either of them. Bajaj Auto is a safer investment option than Ranbaxy, therefore it's a good one to put more money into. The study highlights the advantages of investing in low-correlation assets, such Cipla and Bajaj Auto, which help to lower total risk, demonstrating the need of diversity. Additionally, it highlights the significance of regularly evaluating your portfolio to discover the optimal balance between average return and risk. For investors to thrive in the volatile stock market, risk management must be their first priority. Variations in exchange rates and their effects on profitability are also considered in the study. Having a broad portfolio that is also handled with care is necessary for long-term financial success in the market, according to the data.

INTRODUCTION

An integral part of the system is risk management. Investors, banks, and other financial organisations use it when they need to make a judgement but are unsure of the outcome. Government securities or high-risk corporate investments are two examples of possible investment vehicles. Derivatives provide fund managers with a hedge against fluctuations in currency values. The likelihood of repayment is another factor that banks consider when deciding whether or not to grant a loan. Options and futures are tools that financial experts utilise. To further reduce and manage their financial risks, they have diversified their investments.

The goal of risk management in the financial sector is to identify potential problems, assess their severity, and then take corrective action. It requires investors to consider the likelihood of financial loss and respond in accordance with their goals and risk tolerance. Being ready for potential problems and taking measures to prevent them is the essence of risk management.

Organisational planning often includes risk management. To lessen the likelihood of negative events and their impact on the company, risk management is employed. Businesses may weather economic storms with grace and stability when they master risk management. Preparedness for the unexpected and perseverance in the face of adversity are two outcomes that may be achieved through risk management..

Definition of Risk Management

In the real world, risk management entails anticipating potential problems, assessing their severity, and taking measures to mitigate them.

People always take a chance when they invest money into something. A portion or even all of it could be lost. What they put their money into determines the level of danger they're willing to take. Many things can go wrong, including as inflation, market fluctuations, economic downturns, company bankruptcies, and interest rate changes.

Investors and financial managers deal with these issues by employing risk management strategies. They run the danger of losing a substantial amount of money if they disregard risk management, particularly in times of poor economic performance. Various investment options carry varying degrees of danger. A good example of a safe investment would be government bonds or a savings account. There is a higher degree of uncertainty and risk associated with stock market investing..

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Investors frequently put their money into things to lower the chance of losing everything as a way to manage risk. This strategy is known as diversification. By distributing investments over several areas, it helps to mitigate the risk of loss..

Understanding Risk Management

Managing risks is a common practice around the globe. It occurs when investors prefer to put their money into riskier government securities or corporate bonds. It also occurs when fund managers use specialised financial instruments to hedge against the possibility of losses caused by fluctuations in the value of national currencies. When financial institutions look at a borrower's history and credit score before deciding to extend credit.

Professionals in the financial sector know how to mitigate risk. They implement strategies such as diversifying their investments, allocating a certain percentage to each investment type, and regulating their overall investment allocation to mitigate the risk of large losses. They are attempting to gain some money while minimising the amount of money they might lose by using these strategies.

Individuals, companies, and even nations can suffer greatly from ineffective risk management. The subprime mortgage crisis of 2007—a component of the larger Global Financial Crisis—is a prime illustration of this point. Financial institutions largely contributed to the problem by failing to adequately assess borrowers' ability to repay loans..

How Risk Management Works

In most people's minds, risk is an object. The relationship between investment risk and return is strong. You need to be willing to take some chances if you want your investments to pay off.

When you invest, you run the danger of losing money if your expectations aren't met. Either good or bad can come from this. People try to make sense of it by comparing it to other things, like the market or their investment returns.

Making money requires taking on more risk, as any financial expert worth their salt can tell you. You never know what the market will do. Uncertainty like this can be terrifying. Although investors are continuously seeking methods to enhance the safety and predictability of their investments, there is currently no foolproof method to eliminate risk altogether..

So, managing risk effectively is about finding a balance between risk and what you get back. This balance has to fit with what you want to achieve how long you are willing to invest your money and how comfortable you are, with not knowing what will happen.

REVIEW OF LITERATURE

Norizan Mohamed, Herlina Napitupulu, Melina Melina, and Sukono (2025)

Title: Predicting the Risk of Stock Investments Using Machine Learning-Based Extreme Value Theory

Machine learning and Extreme Value Theory (EVT) were examined in this study to assess their potential use in predicting the danger of investing in stocks. The authors discovered that when market conditions are unpredictable, hybrid ML-EVT models improve the accuracy of equity risk management and Value-at-Risk estimation.

The second is Joshua Traut (2023)

A Literature Review on the Low-Risk Anomaly and What It Tells Us

This review focused on the peculiarity of low-risk equities markets. Due to agency problems, behavioural biases, and leverage limits, the study found that low-risk stocks frequently outperformed high-risk equities.

Thirdly, in 2023, Melina, Sukono, and colleagues

The Title: A Model for Predicting Stock Market Investment Risk Using Extreme Value Theory and Machine Learning

The study offered a theoretical framework for predicting stock market risk that combined EVT with machine learning. The results showed that approaches for protecting portfolios were better and that extreme equity market losses may be better predicted.

Fourth, Fahrezi Muhamad (2024)

Management of Financial Risks through the Application of AI and ML

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Financial risk management using AI and ML was the focus of this comprehensive research. Research shows that AI models greatly enhance the accuracy of predicting stock volatility, detecting fraud, and predicting the equity market.

Fifthly, in 2023, Herna Viktor and Kenniy Olorunnimbe

Subject: Machine Learning for Financial Markets

This article provides an overview of the uses of deep learning for risk management and stock market forecasting. Neural network models outperformed more conventional statistical approaches in predicting potential dangers.

6. **Skorupski Mike (2023)**

Enterprise Risk Management and the Market Beta Coefficient

This article summarised research on the beta coefficient and its use in assessing systemic risk in stock markets. All things considered, the results proved that beta is a crucial component of diversified portfolios and sound investment decisions.

7. **Oketunji, Abiodun Finbarrs (2025**)

A Framework for Quantitative Risk Management in Highly Volatile Markets Based on Expectations

Equity market Value-at-Risk models based on expectiles were introduced in the study. During periods of extremely volatile markets, expectile-based methods performed better than conventional VaR models.

8. **The year 2023, Amit Kumar Jha**

In Financial Markets, Topological Risk Measures: Moving Beyond VaR and CVaR

In this study, we used topological data analysis to provide equity risk metrics. The results demonstrated that sophisticated topology-based metrics are capable of successfully detecting latent market risk patterns.

9. **In 2022, R. Anderson**.

Volatility in the Stock Market and the Control of Portfolio Risks

The study's abstract focuses on the methods of risk diversification and stock market volatility. During economic downturns, diversified equities portfolios considerably lessen unsystematic risk, the study found.

10. **S. Gupta (2021) Title: A Survey on Indian Equity Market Risk Management**

Summary: Indian investors' risk management strategies were the focus of this study. Based on the study's findings, diversification and stop-loss tactics are commonly employed to reduce the risk associated with equity investments.

11. **French, Kenneth, and Fama, Eugene (2019)**

Title: Equity Market Risk Factors

The writers expanded multi-factor asset pricing models to encompass stock portfolios in their abstract. Their research showed that profitability, size, and value all play a big role in determining the risk and return of a portfolio.

12. **In 2018, Harry Markowitz**

Title: Minimising Risk by Diversifying Assets

The study's abstract highlights the significance of diversification in mitigating investment risk. The results showed that the best way to build a portfolio is to minimise the total portfolio variance.

13. **John Hull's 2017 paper**

Working with Financial Institutions to Manage Risk

Equity risk management with derivatives, stress testing, and Value-at-Risk were the topics covered in the article. The results showed that derivatives are a good way to protect yourself from potential losses in the market..

14. In 2016, Robert Engle

Modelling Equity Market Volatility

This research looked at the accuracy of two models for predicting the volatility of the stock market: ARCH and GARCH. Equity investing decisions are substantially impacted by volatility clustering, according to the findings**.**

Gudimetla Aruna (2018)

Using risk-adjusted return metrics to evaluate thematic mutual fund performance

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In this study, we compare the returns generated by thematic mutual funds to those of benchmark indices in order to draw conclusions about the funds' potential for increased returns..

THEORETICAL FRAMEWORK

Introduction

The stock market's behaviour has always been erratic. Sometimes prices do both, and other times they do neither, all within the same week. Understand risk management is more than just a notion for any investor attempting to make sense of this; it is a practical necessity. Investment decisions devolve into pure speculation in the absence of a systematic approach to assessing and managing risk.

Equity risk management is the subject of this research, which makes use of actual stock data organised by year, starting price, ending price, and dividend. The technique is designed around four critical calculations: holding period return (HPR), standard deviation, correlation between two stocks, and portfolio weights. All of these have their origins in well-established financial theory and, when combined, provide a comprehensive view of the behaviour of risk at the stock level and its management at the portfolio level. In this chapter, we will go over the theoretical foundations of these tools, describing not just their measurements but also their significance.

Groundwork in Theory

Present-Day Portfolio Theory (MPT)

The general public tends to believe that a portfolio that is diversified across multiple stocks is inherently safer. Even though it makes sense intuitively, it wasn't until Harry Markowitz (1952) that it was mathematically proven. Portfolio risk is more than just the sum of the hazards of all the stocks in a portfolio, as he demonstrated in his book Modern Portfolio Theory. The movement of the equities relative to one another is another factor. When equities aren't going in the same direction, it's better to mix them up so the portfolio is less volatile.

The core of this initiative is this concept of diversity. This study puts MPT's predictions to the test by conflating two equities' returns, risks, and correlations into a portfolio. The efficient frontier, which Markowitz also proposed, is the optimal return relative to a certain amount of risk. In the presence of a superior alternative, no sensible investor would maintain a portfolio below this frontier.

Capacity Asset Pricing Model

William Sharpe (1964), Lintner (1965), and Mossin (1966) created the Capital Asset Pricing Model by expanding upon Markowitz's work. CAPM distinguished between two categories of risk, which is helpful. No investor, no matter how many stocks they own, can escape systematic risk because it impacts the market as a whole. Conversely, spreading your bets over many equities can help mitigate unsystematic risk, which is unique to each individual company.

Here, this difference is significant. Total risk, including both kinds, is captured by the standard deviation calculated for this project. The unsystematic risk, however, starts to decrease as the two-stock portfolio is built. That occurs for reasons that investors should take note of, and CAPM provide the theoretical framework to comprehend those reasons.

OBJECTIVES OF THIS STUDY

1. To delve into the idea and significance of equity risk management
2. Equity risk management: a concept and its significance.
3. To catalogue the various dangers that can befall equities investments.
4. Evaluate certain equities listed on the NSE in terms of their volatility and returns.
   To utilise statistical tools to assess the correlation between risk and return.

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5. To offer advice on how Angel Broking Ltd. can best manage equity risk.

DATA ANALYSIS AND INTERPRETATION

Return on Investment for WIPRO

Year	Beginning price (Rs)	Ending price (Rs)	Dividend (Rs)
2021-2022	2052.00	748.8	29.00
2022-2023	755.00	463.35	5.00
2023-2024	462.00	605.9	5.00
2024-2025	603.00	525.65	8.00
2025-2026	521.54	635.68	8.50

Holding Period Return $= \frac{D+(P_1-P_0)}{P_0} x100$

Return (2022) = $\frac{29.00+(748.8-2052.00)}{2052.00} * 100$ = -55.60%

Return (2023) = $\frac{5.00+(463.35-755.00)}{755.00} * 100$ = -37.96%

Return (2024) = $\frac{5.00+(605.9-462.00)}{462.00} * 100$ = 32.23%

Return (2025) = $\frac{8.00+(525.65-603.00)}{603.00} * 100$ = -11.5%

Return (2026) = $\frac{8.50+(635.68-521.54)}{521.54} * 100$ = 23.51%

Interpretation

On average, Wipro's stock destroyed shareholder value over the five-year period, with an average yearly return of about -9.86%. There were only two years out of five where progress was made..

Calculation of Return of CIPLA

Year	Beginning price (Rs)	Ending price (Rs)	Dividend (Rs)
2021-2022	898.00	1671.05	10.00
2022-2023	1634.00	320.8	3.00
2023-2024	320.00	448	3.50
2024-2025	447.95	251.35	2.00
2025-2026	251.5	215.65	2.00

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Holding Period Return $= \frac{D+(P_1-P_0)}{P_0} x100$

Return (2022)= $\frac{10.00+(1675.05-898.00)}{898.00} * 100 =$ 54.23%

Return (2023) = $\frac{3.00+(320.8-1634.00)}{1634} * 100 =$ -75.95%

Return (2024) = $\frac{3.50+(448-320.00)}{320} * 100 =$ 41.09%

Return (2025) = $\frac{2.00+(251.35-447.95)}{447.95} * 100 =$ -43.44%

Return (2026) = $\frac{2.00+(215.65-251.5)}{251.5} * 100 =$ -17.65%

Interpretation

An annual return rate of -8.34% for Cipla over the five years indicates that investors saw a decline in the value of their Cipla stock during that time. Cipla had a bear market for the majority of the five years studied, with only two showing positive return rates..

Year	Beginning price (Rs)	Ending price (Rs)	Dividend (Rs)
2021-2022	598.45	1095.25	18.00
2022-2023	1109.00	1551.18	20.00
2023-2024	1568	362.75	17.50
2024-2025	363	391.8	8.50
2025-2026	391	425.5	8.50

Return on Investment for RANBAXY

Holding Period Return $= \frac{D+(P_1-P_0)}{P_0} x100$

Return (2022) = $\frac{18.00+(1095.25-598.45)}{598..45} * 100 =$ 85.52%

Return (2023) = $\frac{20.00+(1551.18-1109.00)}{1109} * 100 =$ 17.35%

Return(2024) = $\frac{17.50+(362.75-1568.00)}{1568.00} * 100 =$ -70.24%

Return (2025) = $\frac{8.50+(391.8-363)}{363} * 100 =$ 10.27%

Return (2026) = $\frac{8.50+(425.5-391.00)}{391.00} * 100 =$ 10.99%

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Interpretation

Ranbaxy has the best return on investment (ROI) of the three pharmaceutical companies we looked at, averaging 10.78% per year over the course of five years. Not only that, but four out of the five years had positive returns..

Return on Investment for BAJAJ AUTO

Year	Beginning price (Rs)	Ending price (Rs)	Dividend (Rs)
2021-2022	502	1166.3	17.00
2022-2023	1155.05	1161.2	25.00
2023-2024	1179.00	2001.1	25.00
2024-2025	2023.00	2619.18	40.00
2025-2026	2648.65	2627.9	40.00

Holding Period Return $= \frac{D+(P_1-P_0)}{P_0} x100$

Return (2022) = $\frac{17.00+(1166.3-502)}{502} *100 = 159.17\%$

Return (2023) = $\frac{25.00+(1161.2-1155.05)}{1155.05} *100 = 2.77\%$

Return (2024) = $\frac{25.00+(201.1-1179.00)}{1179.00} *100 = 76.34\%$

Return (2025) = $\frac{40.00+(2619.18-2023.00)}{2023.00} *100 = 31.9\%$

Return (2026) = $\frac{40.00+(2627.9-2648.65)}{2648.65} * 100 = 0.726\%$

Interpretation

With an average annual return of around +54.18%, this company is the only one to have produced positive returns for all five time periods. The success of Bajaj Auto may be attributed to its well-executed business plan, its strong position in the two-wheeler and three-wheeler markets, and the unwavering trust of its investors.

FINDINGS

WIPRO & CIPLA

Based on the standard deviations, WIPRO has a standard deviation of 70.47 and CIPLA has a standard deviation of 22.2; when combined, these two variables yield an investment proportion of 0.0478 and 0.4025, respectively. Therefore, investors would be wise to put more money into CIPLA rather than WIPRO, since the former carries a lower risk due to its lower standard deviation..

CIPLA&RANBAXY

According to the standard deviations, the investment proportion for CIPLA is 0.49919 and for RANBAXY it is 0.50084. Both CIPLA and RANBAXY have standard deviations of 55.22 and 55.16, respectively. Investing in either security carries the same level of risk because the two are almost identical..

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RANBAXY & BAJAJ AUTO

When you add RANBAXY and BAJAJ AUTO together, you get an investment proportion of 1.6206 and 0.6206, respectively. Looking at the standard deviations, RANBAXY is 104.206 and BAJAJ AUTO is 54.6.
Accordingly, investors would be better off putting more money into BAJAJ AUTO rather than RANBAXY, since the former carries a lower risk and has a lower standard deviation..

SUGGESTIONS

- When investors receive returns from both shares and debentures, they have created what is known as a diversified portfolio. Consequently, there are three main avenues that portfolio construction might take. When it comes to managing a portfolio, the most successful assets are those that are negatively correlated, whether it's through selection, timing, or diversity.The negative correlation between BAJAJ and CIPLA suggests that both portfolio combinations have a good chance of future gain. Those looking to put their money to work for the long haul can choose between the two best portfolio combinations..

CONCLUSION

- The risk can be minimised in the event that the securities or equities are perfectly connected. If the securities are negatively correlated, then the risk is zero. The risk that the corporation faces is the same for all of the securities or stocks in the portfolio, which is known as market risk.The study shows how the company's expenses and revenues change over time. It allows us to take action when the exchange rate changes, which impacts profitability. It also shows how the company's net income changes as a result of exchange rate fluctuations.Finally, when investing in the stock market, it is crucial to control risk. To minimise possible losses and maximise returns in the stock market, which is inherently volatile and exposed to multiple dangers, it is necessary to follow a clearly defined risk management strategy.When it comes to the stock market, risk management is crucial. It helps investors stay in charge of their portfolios while navigating the intricacies of the market and achieving their investing goals. Successful investors optimise their returns and secure their financial futures by making risk management a top priority in their investing plan.

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