MAJOR RESEARCH PROJECT

A Study on Risk and Return Analysis on Selected 4 Stocks in Nifty Index

Submitted By

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Certificate

This is to certify that Mr. Abhinav Srivastava roll no 2K21/DMBA/10 has submitted the major research report on **A Study on Risk and Return Analysis on Selected 4 Stocks in Nifty Index** in partial fulfilment of Master of Business Administration (MBA) program from Delhi School of Management, Delhi Technological University, New Delhi during the academic year 2021-2023.

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Declaration

I, Abhinav Srivastava, hereby declare that the presented project report titled "**A Study on Risk and Return Analysis on selected 4 Stocks in Nifty Index**" is uniquely prepared by me in the partial fulfilment of the requirement for the degree in MBA in Finance and Operations.

I also confirm that the report is only prepared for my academic requirement, not for any other purpose. It might not be used with the interest of the opposite party of the corporation.

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Executive Summary

The topic A study on risk and return analysis of selected 4 stocks in nifty index has been selected because of lot of investors are building investments in shares of different companies of nifty index apart from other index. And the 5 companies are selected because they are the key drivers and they provide more weight for the progress of nifty index.

The importance of risk-return relationship is advocate from both investors and firms. Evaluate the relationship between expected rate of return and the risk of asset would help investors to make enhanced and more accurate decision on investing in different industries. To this reason, the evaluation has audited the risk return relationship and strategies for estimating, hypotheses and experimental review to build up an execution measures complementary distinctive industry parts. The empirical evidences were discussed within the scope of market risks and returns.

At that point, the hypotheses and open up writing recognized with Capital Asset Pricing Model (CAPM) was investigated to demonstrate the connection between expected return and efficient risk Treynor Index, Sharpe Index, and Jansen Index as performance measures were extract from CAPM model and the correlation were discussed between them. As of result, the review projected a risk return build respects to grow better execution measures for industry parts.

The project report covers company profile, industry profile, theoretical background of the study, data analysis and interpretation, and provides recommendations based on the findings and the conclusion. It also contains the financial statements of the company.

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Chapter 1- Introduction

1.1 Background

Risk and return are two important concepts in financial management. The risk of an investment refers to the probability or likelihood of loss or reduced income. The return of an investment is the income or profit generated from the investment over a period of time.

In general, investments with higher risks tend to have higher returns, while investments with lower risk tend to have lower returns. This is known as the risk-return trade off. Some examples of high-risk investments include stocks, commodities, and options, while low-risk investments include government bonds and certificates of deposit.

Investors must consider their own risk tolerance and investment goals before making investment decisions. It is important to note that past performance does not guarantee future results, and that all investments come with the risk of losing money.

Risk and return are two essential concepts that have significant implications for investing in the financial market. Investors typically seek investments with high returns, but this often involves taking on greater risks. An understanding of risk and return trade-offs is crucial in making investment decisions.

Risk refers to the probability or likelihood of loss or uncertainty of returns associated with an investment. There are different types of risks associated with investing, including market risk, credit risk, interest rate risk, inflation risk, liquidity risk, and currency risk. Market risk, also known as systematic risk, is the risk of loss due to movements in the broader financial market. Credit risk is the potential for loss arising from the default or non-payment by the issuer of debt securities. Interest rate risk refers to the risk of loss due to changes in interest rates, while inflation risk is the potential for loss of value due to inflationary pressures. Liquidity risk is the potential for loss due to the inability to sell an asset quickly, while currency risk is the risk of loss due to the fluctuation in exchange rates.

Return, on the other hand, refers to the profit or gain that an investor realizes from an investment. It is the amount of money generated by an investment and usually expressed in terms of percentage. Return is influenced by the risks assumed by investors- the higher the risk, the higher the expected

return and vice versa. There are different types of returns, including capital gains, dividends, and interest income from bonds and other fixed-income securities. Capital gains occur when an investor sells an asset at a higher price than the purchase price. Dividends are periodic payments made by companies to shareholders, and interest income is earned on the interest paid on bonds and other fixed-income securities.

Risk and return are interconnected, and investors demand higher returns to compensate for taking on greater risks. The trade-off between risk and return is a fundamental principle of finance, where investors will only invest in a high-risk investment if they expect higher returns to compensate for the risk involved. For example, stocks are generally riskier than bonds, and investors demand higher returns for investing in stocks than in bonds.

The relationship between risk and return can be measured by the investment's risk premium. The risk premium is the additional return that investors demand for taking on additional risk. It is the difference between the return on a risky investment and the risk-free rate of return. The risk-free rate of return is the return on an investment that is considered to have no risk, such as a government bond. Investors expect to earn a premium above the risk-free rate of return to compensate for taking on risk.

In summary, risk and return are fundamental concepts in investing. Investors are always looking for investments that offer high returns, but these investments typically require taking on greater risks. The risk-return trade-off is crucial in investment decision-making. Investors demand higher returns to compensate for taking on additional risks. The measure of this relationship is the risk premium, which is the additional return earned for taking on risk above the risk-free rate of return. Understanding risk and return is crucial in making well-informed investment decisions.

1.1.2 Return

Return is essential spurring power that drives venture. It refers to the reward for the activity of taking risk, Hence the evaluation of return is important to understand the profitability or the functioning of the firm.

There are two types of returns, those are:

1. Current return:- The segment regularly strikes a chord when one is contemplating return is occasional income as isolated or premium produced by the venture. Current return is measured as the intermittent return in connection to the starting cost of the venture.

2. Capital return:- The second imperative part of return is reflected in the value change called the capital return. It is basically the cost of thankfulness (or deterioration) partitioned by the starting cost of advantage.

Total return = capital return + current return

1.1.3 Risk

Chance alludes towards likelihood that the genuine result of a venture will concede from expected result. All the more particularly, most speculators are worried about the genuine result being not as much as the normal result. The more extensive scope of conceivable result is more noteworthy the risk. The different sorts of risks are

A: Systematic risk

Efficient hazard alludes to that bit of variety consequently brought about by components that influence the cost of all securities. The impact is methodical return makes the costs of all individual securities move in same bearing. This hazard is as a matter of course and can't be controlled. Efficient hazard emerges because of taking after element:

1.Market risk

Variety in costs started off because of genuine social, political and monetary occasions is alluded to as market hazard. Showcase hazard emerges out of changes popular and supply weights in the market taking after the changing stream of news or desire.

2. Interest risk

By and large costs of securities tend to move contrarily with changes in the rate of intrigue.The market movement and financial specialists recognitions are impacted by the adjustments in the loan fees which thusly rely on upon nature of instruments, securities, stocks, and so forth.

3.Risk of purchasing power

This risk refers to the type of risk where the cash flows from an investment in future will not match value of the present purchasing power of money. The main reason behind this is inflation.

4.Liquidation risk

The risk that comes with short term trading of stocks which may go wrong or opposite to the speculation of the brokers or traders. This sort of hazard is essential in some venture speculation choice yet it is talked about widely in speculation courses.

5.Foreign trade chance

Uncertainly this is the hazard related with potential changes in the remote trade estimation of money.

Unsystematic Risk

Unsystematic hazard alludes to that segment of hazard that is brought on because of elements one of a kind or identified with a firm or an industry. Unsystematic hazard emerges because of taking after components:

1.Business risk

Business hazard can be inner and in addition outside. Inside hazard is brought about because of shameful item blend, non-accessibility of materials, nonattendance of vital administration, and so forth. Outer hazard emerges because of progress in working conditions, change in business laws, universal economic situations, and so forth.

2.Financial risk

Monetary hazard is related with capital structure of the organization. An organization with no obligation financing has no budgetary hazard. The degree of money related hazard relies on upon the use of the association's capital structure.

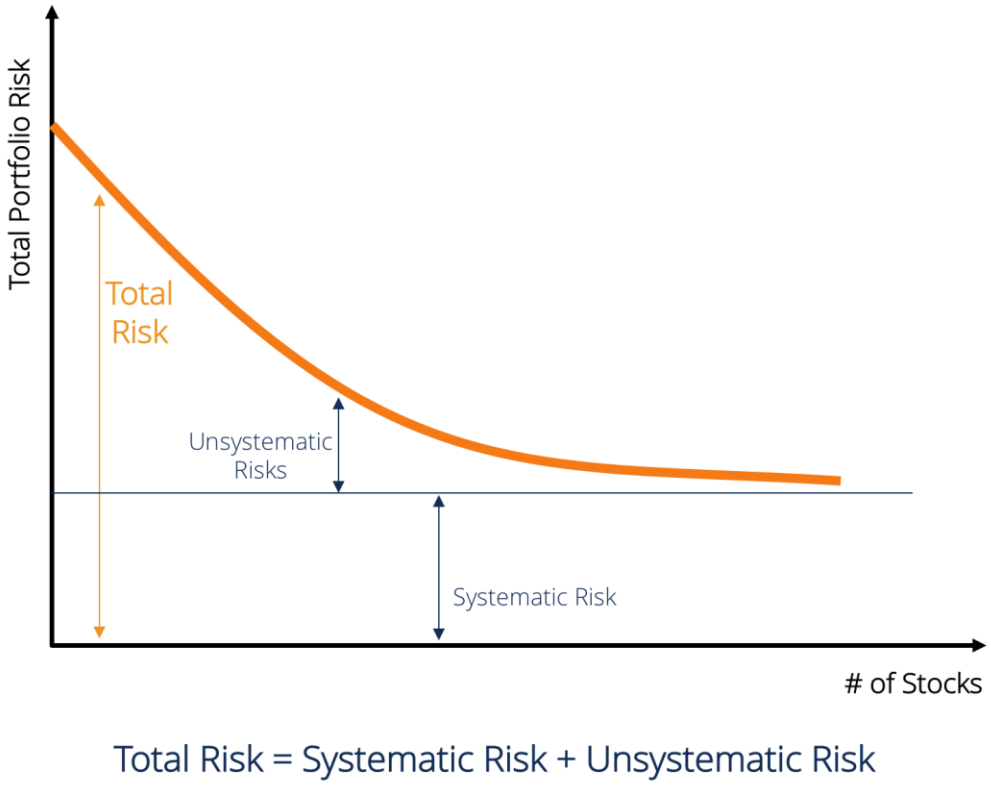


Figure: 1.1 Total Risk

1.2 Statement of Problem

Measuring return enables financial specialists to survey how well they have done, and it has an influence in the estimation of future returns. Security examination is worked around the possibility that financial specialists are worried with two essential properties intrinsic in securities: the arrival that can be normal from holding a security and the risk on that arrival that is accomplished will be not as much as the risk that was normal.

The basic role of this paper is to center upon return and exposure and how they are measured. Speculators need to expand anticipated that profits subjected would their flexibility for risk. Return is the persuade power and the rule compensate in the speculation procedure and it is the key technique accessible to speculators in looking at option venture.

VAR is calculated using two methods Historical simulation and Montecarlo simulation.

1.3 Objectives of Study

- Measure definite and ordinary returns using beta and co-efficient correlation
- Learn the instability in contrast with market.
- To identify risk levels of different stocks for investment decisions.

- Calculate Value at risk using two methods Historical simulation and Montecarlo simulation.

Measuring risk and return analysis is a vast domain, which requires new techniques and continuous research to reduce, and hedge risk, so there is always scope to calculate risk and return for an investment.

1.4 Data Collection

- Created a portfolio with 4 stocks which include ITC, HDFC BANK,TCS and ICICI.
- Secondary data collected from yahoo.com from the year 2015 to 2023.

Table:1.1 Stocks Overview

S.No	Name	Type	Industry	NSE
1	HDFC Bank	Public	Banking, Financial Services	HDFCBANK
2	ICICI	Public	Banking, Financial Services	ICICIBANK
3	TCS	Public	IT services, IT consulting	TCS
4	ITC	Public	Conglomerate	ITC

Source: Self Analysis Using excel

Chapter 2- Literature Review

In the past two decades, the banking industry has evolved from a financial intermediation between depositors and borrowers, to a "one-stop" Centre for a range of financial services like insurance, investments, and mutual funds. The advancement of information and communicative technology (ICT) is given credit for the evolution of banking services, in particular online banking. The development in ICT has not only provided vast banking opportunities previously beyond reach, but also heightens the competition and risks faced by banks in the financial system.

Risk is the deviation of the expected outcome. In one way, risk can be classified as business risk and financial risk. Business risk arises from the nature of a firm's business which relates to factors affecting the product market. Financial risk arises from possible losses in financial markets due to movements in financial variables It is usually associated with leverage with the risk that obligations and liabilities cannot be met with current assets

Another way of decomposing risk is systematic risk and unsystematic risk. Systematic risk is associated with the overall market, or the economy and it can be mitigated in a large diversified portfolio, whereas unsystematic risk is linked to a specific asset or firm and cannot be diversified though its parts can be reduced through mitigation and transferring techniques

However, some risks cannot be eliminated or transferred and must be absorbed by the banks. The first is due to the complexity of the risk and difficulty in separating it from asset. The second risk is accepted by the financial institutions as these are central to their business. These risks are accepted because the banks are specialized in dealing with them and get rewarded accordingly. The objective of financial institutions is to maximize profit and shareholder value-added by providing different financial services mainly by managing risks.

The risk of loss from adverse movement in financial market rates (interest and exchange rate) and bond, equity or commodity prices. A bank's market risk exposure is determined by both the volatility of underlying risk factors and the sensitivity of the bank's portfolio to movements in those risk factors

The risk of changes in income of the bank because of movements in market interest rates. Interest rates risk is a major concern for banks due to the nominal nature of their assets and the asset-liability maturity mismatch.

Value at risk (VaR) is one of the most widely used risk measures in finance. VaR was popularized by J.P. Morgan in the 1990s. The executives at J.P. Morgan wanted their risk managers to generate one statistic at the end of each day, which summarized the risk of the firm's entire portfolio. What they came up with was VaR.

VaR has become extremely popular in risk management. The appeal of VaR is its simplicity. Because VaR can be calculated for any portfolio, it allows us to easily compare the risk of different portfolios. Because it boils risk down to a single number, VaR provides us with a convenient way to track the risk of a portfolio over time. Finally, the concept of VaR is intuitive, even to those not versed in statistics. Because it is so popular, VaR has come under a lot of criticism. As we will see, VaR is not a perfect risk measure, but it is incredibly versatile. While some of the criticism is justified, much of the criticism is misplaced.

Regulatory guidelines

The Reserve Bank of India and the Basel 2 accord that India implemented follows key frameworks and parameters so as to manage the financial stress and shocks that banks are subject to.

Banks in the process of financial intermediation are confronted with various kinds of financial and non-financial risks viz., credit, interest rate, foreign exchange rate, liquidity, equity price, commodity price, legal, regulatory, reputational, operational, etc. These risks are highly interdependent and events that affect one area of risk can have ramifications for a range of other risk categories.

Thus, top management of banks should attach considerable importance to improve the ability to identify, measure, monitor and control the overall level of risks undertaken.

The broad parameters of risk management function should encompass:

i) organisational structure;

ii) comprehensive risk measurement approach;

iii) risk management policies approved by the Board which should be consistent with the broader business strategies, capital strength, management expertise and overall willingness to assume risk;

iv) guidelines and other parameters used to govern risk taking including detailed structure of prudential limits;

v) strong MIS for reporting, monitoring and controlling risks;

vi) well laid out procedures, effective control and comprehensive risk reporting framework;

vii) separate risk management framework independent of operational Departments and with clear delineation of levels of responsibility for management of risk; and

viii) periodical review and evaluation.

2. Risk Management Structure

2.1 A major issue in establishing an appropriate risk management organisation structure is choosing between a centralised and decentralised structure. The global trend is towards centralising risk management with integrated treasury management function to benefit from information on aggregate exposure, natural netting of exposures, economies of scale and easier reporting to top management. The primary responsibility of understanding the risks run by the bank and ensuring that the risks are appropriately managed should clearly be vested with the Board of Directors. The Board should set risk limits by assessing the bank's risk and risk bearing capacity. At organisational level, overall risk management should be assigned to an independent Risk Management Committee or Executive Committee of the top Executives that reports directly to the Board of Directors. The purpose of this top level committee is to empower one group with full responsibility of evaluating overall risks faced by the bank and determining the level of risks which will be in the best interest of the bank. At the same time, the Committee should hold the line management more accountable for the risks under their control, and the performance of the bank in that area. The functions of Risk Management Committee should essentially be to identify, monitor and measure the risk profile of the bank. The Committee should also develop policies and procedures, verify the models that are used for pricing complex products, review the risk models as development takes place in the markets and also identify new risks. The risk policies should clearly spell out the quantitative prudential limits on various segments of banks' operations.

The Committee should design stress scenarios to measure the impact of unusual 2 market conditions and monitor variance between the actual volatility of portfolio value and that predicted by the risk measures. The Committee should also monitor compliance of various risk parameters by operating Departments.

2.2 A prerequisite for establishment of an effective risk management system is the existence of a robust MIS, consistent in quality. The existing MIS, however, requires substantial upgradation and strengthening of the data collection machinery to ensure the integrity and reliability of data.

2.3 The risk management is a complex function and it requires specialised skills and expertise. Banks have been moving towards the use of sophisticated models for measuring and managing risks. Large banks and those operating in international markets should develop internal risk management models to be able to compete effectively with their competitors. As the domestic market integrates with the international markets, the banks should have necessary expertise and skill in managing various types of risks in a scientific manner. At a more sophisticated level, the core staff at Head Offices should be trained in risk modelling and analytical tools. It should, therefore, be the endeavour of all banks to upgrade the skills of staff.

2.4 Given the diversity of balance sheet profile, it is difficult to adopt a uniform framework for management of risks in India. The design of risk management functions should be bank specific, dictated by the size, complexity of functions, the level of technical expertise and the quality of MIS. The proposed guidelines only provide broad parameters and each bank may evolve their own systems compatible to their risk management architecture and expertise.

2.5 Internationally, a committee approach to risk management is being adopted. While the Asset - Liability Management Committee (ALCO) deal with different types of market risk, the Credit Policy Committee (CPC) oversees the credit /counterparty risk and country risk. Thus, market and credit risks are managed in a parallel two-track approach in banks. Banks could also set-up a single Committee for integrated management of credit and market risks. Generally, the policies and procedures for market risk are articulated in the ALM policies and credit risk is addressed in Loan Policies and Procedures.

2.6 Currently, while market variables are held constant for quantifying credit risk, credit variables are held constant in estimating market risk. The economic crises in some of the countries have revealed a strong correlation between unhedged market risk and credit risk.

Chapter 3- Research Methodology

Investors and analysts use the value-at-risk (VaR) method. VaR modeling is a statistical risk management method that quantifies a stock or portfolio's potential loss as well as the probability of that potential loss occurring. While well-known and widely utilized, the VaR method requires certain assumptions that limit its precision.

For example, it assumes that the makeup and content of the portfolio being measured are unchanged over a specified period. Though this may be acceptable for short-term horizons, it may provide less accurate measurements for long-term investments.

Beta is another relevant risk metric, as it measures the volatility or market risk of a security or portfolio in comparison to the market as a whole. It is used in the capital asset pricing model (CAPM) to calculate the expected return of an asset.

To measure market risk, the following methods can be used:

- **Value at Risk (VaR):** VaR measures the potential loss in a portfolio over a specified period at a given confidence level. It is calculated based on historical market data and simulates possible market events to estimate the maximum loss that may occur.
- **Stress testing**: Stress testing involves simulating different scenarios to determine the impact of extreme market movements on a portfolio. This helps identify potential weaknesses in the portfolio's risk management strategy.
- **Expected shortfall:** Expected shortfall measures the average loss above a certain threshold. It takes into account the probability of the portfolio losing more than a specified amount.
- **Beta:** Beta measures the sensitivity of an asset's returns to market movements. A beta of 1 indicates that the asset moves in the same direction as the market, while a beta of less than 1 indicates that the asset is less volatile than the market.
- **Historical analysis**: Historical analysis examines past market data to determine the volatility and correlation between different assets. This helps in estimating the potential losses that may occur in a future market event.

3.1 Capital Asset Pricing Model

The capital asset pricing model (CAPM) is a financial model used to determine the expected return on an asset based on the risk-free rate of return, the expected market return, and the asset's beta coefficient. It is used to estimate the required return on equity for a company's cost of capital calculation.

The formula for the CAPM is as follows:

Expected return = risk-free rate + beta (expected market return – risk-free rate)

Where:

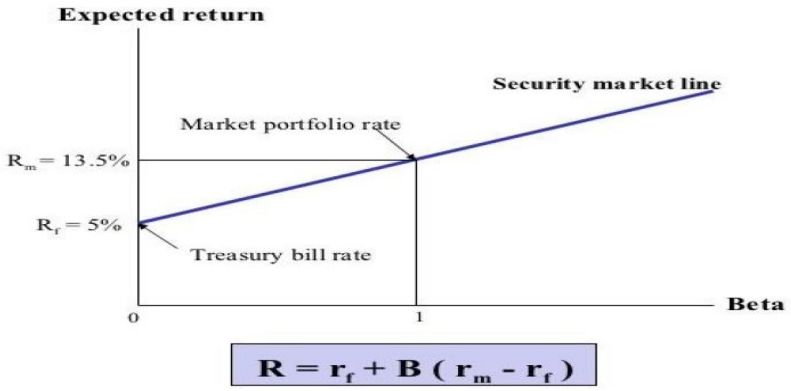
Expected return: the return investors expect to receive on an asset

Risk-free rate: the rate of return on a risk-free investment, such as government bonds

Beta: the measure of an asset's volatility relative to the market

Expected market return: the expected return on the overall market.

Figure: 3.1 Capital Asset Pricing Model



Source: https://hbr.org/1982/01/does-the-capital-asset-pricing-model-work

The idea behind the equation is that an investor needs to be compensated for taking on any additional risk beyond the risk-free rate. The beta coefficient is used to measure the additional risk of a given investment compared to the broader market. The market return is multiplied by the beta, and the result is added to the risk-free rate to arrive at the expected return.

This equation tells us that an investor's expected return should increase as the beta of the investment increases, but it also shows us that an investment with a beta greater than 1 is likely to outperform the market if the market is up but will underperform if the market is down. The opposite is true for investments with a beta less than 1. The CAPM is often criticized for its simplifying assumptions, such as the efficient market hypothesis, which is not without its limitations. However, it provides a useful framework for measuring the risk and expected returns of investments.

One of the primary applications of the CAPM is in determining the cost of capital for a company. This is because the cost of capital is based on the expected returns of the company's equity and debt, which can be determined using the CAPM. When a company raises funds from investors, it needs to provide a rate of return that is commensurate with the risk they are taking on. By using the CAPM to calculate the expected returns of investors, a company can determine the cost of capital for its operations.

Another important application of the CAPM is in portfolio management. Investment managers can use the model to construct portfolios that balance risk and return by investing in assets with different betas. A portfolio with a mix of low beta and high beta securities will have a lower expected return than a portfolio that only invests in high beta securities, but it will also have lower volatility. By using the CAPM to balance the risk and return of a portfolio, investors can minimize their exposure to risk while still achieving their investment goals.

In summary, the Capital Asset Pricing Model is a fundamental tool for understanding the relationship between risk and expected returns in finance. The theory assumes that investors are rational and risk-averse and seeks to estimate the expected returns of an investment based on its beta coefficient and the expected market return. Despite its limitations, the CAPM is widely used in finance to price securities, measure the performance of investment portfolios, and estimate the cost of capital for companies.

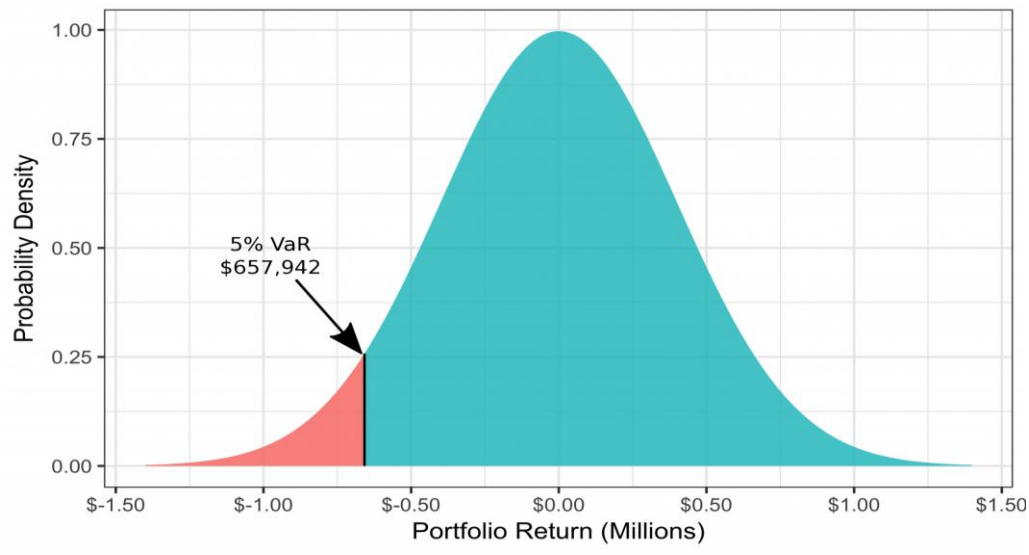
The CAPM assumes that investors are rational and risk-averse, and that they require a higher return for taking on more risk. It also assumes that the market is efficient and that all investors have access to the same information.

The CAPM has been criticized for its reliance on the efficiency of the market and its inability to account for some factors that affect asset prices, such as inflation and changes in market sentiment. However, it remains a widely used model for estimating the expected return on an asset.

3.2 VAR introduction

In its most general form, the Value at Risk measures the potential loss in value of a risky asset or portfolio over a defined period for a given confidence interval. Thus, if the VaR on an asset is $ 100 million at a one-week, 95% confidence level, there is a only a 5% chance that the value of the asset will drop more than $ 100 million over any given week. In its adapted form, the measure is sometimes defined more narrowly as the possible loss in value from "normal market risk" as opposed to all risk, requiring that we draw distinctions between normal and abnormal risk as well as between market and non-market risk.

Figure:3.2 Value at Risk



Source: https://corporatefinanceinstitute.com/resources/risk-management/value-at-risk-var/

Features of Value at Risk (VaR):

Given below are features of Traditional VaR estimate:

- VaR is probability based and allows the users to interpret possible losses for various confidence levels.
- It is a consistent measurement of financial risk as it uses the possible dollar loss metric enabling the analysts to make direct comparisons across different portfolios, assets or even business lines.
- VaR is calculated based on a common time horizon, and thus, allows for possible losses to be quantified for a particular period.

The choice of confidence level is usually based on the industry requirements or reporting norms suggested by the Regulators. Choice of time horizon will depend on the type of asset being analyzed, for example:

- On a common stock it can be estimated for any horizon depending on the frequency of trade or user requirement.
- On a portfolio VaR can be calculated for a period of turnover only; i.e. till the time portfolio holdings remain consistent, as the holding changes or in other words if a trade is recorded in the portfolio the VaR has to be calculated again. Therefore, time-horizon for a portfolio depends on the frequency of trading in its assets.
- For a business analysis it may depend on the employee evaluation periods, key decision making events etc. could provide the possible time horizons.
- Regulatory and taxation requirements
- External Quality Assessments etc.

It is important to note that VaR comparison between two portfolios, business lines or assets requires that the two variables, i.e. time horizon and confidence level, be consistent for all the portfolios being compared.

3.2.1 Methods for calculating Value at Risk (VaR)

The methods used for calculating VaR actually hold the key to the reliability of the estimate. Also various methods can be used to calculate the possible value at risk on the same time horizon, depending on the availability of the data.

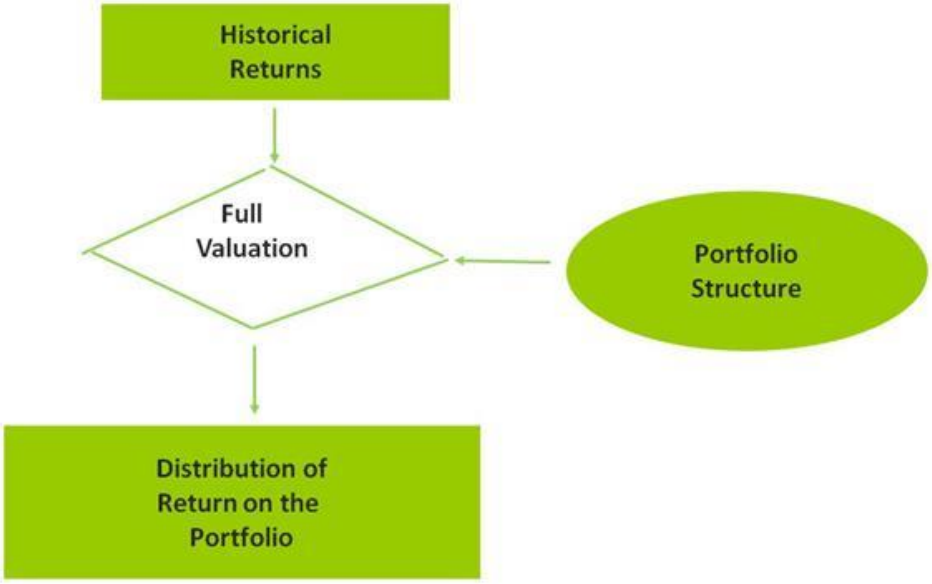
For example: If VaR is calculated for a very short horizon, say intraday, amount of data may be too small to provide a consistent or reliable answer, but it may not be possible to include additional actual data (due to trade changes or other restrictions). In such cases sample size has to be artificially increased using methods of re-sampling to create enhanced view of the current situation and increase the reliability of the VaR.

Historical Simulation Method for Value at Risk (VaR)

This approach requires fewer statistical assumptions for underlying market factors. It applies the historical (100 days) changes in price levels to current market prices to generate a hypothetical data set. Then order the data set is by the size of gains/losses. Value at Risk (VaR) is the value that is equal or exceeded the required percentage of times.

Historical simulation is a non-parametric approach of estimating VaR, i.e. the returns are not subjected to any functional distribution. Estimate VaR directly from the data without deriving parameters or making assumptions about the entire distribution of the data. This methodology is based on the premise that the pattern of historical returns is indicative of future returns.

Figure: 3.3 Historical Simulation



Source: https://www.risk.net/definition/historical-simulation

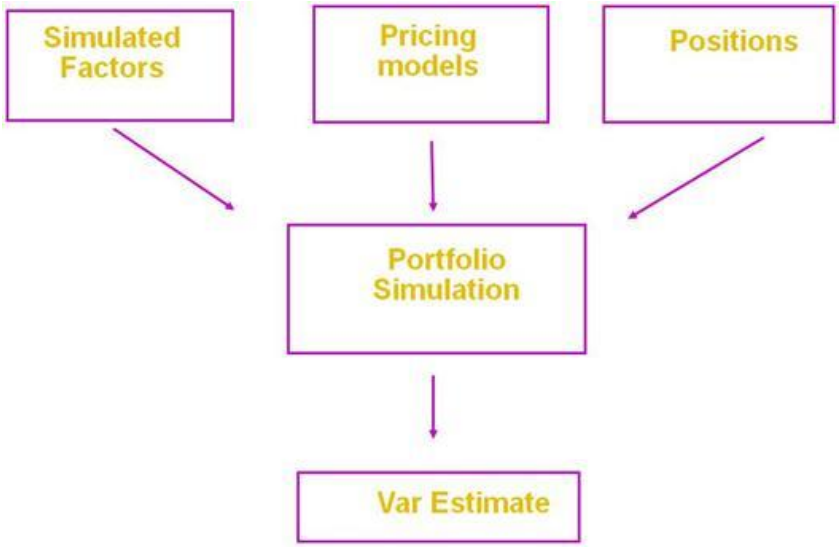
Monte Carlo Simulation for calculating Value at Risk (VaR)

The approach is similar to the Historical simulation method described above except for one big difference. The hypothetical data set used is generated by a statistical distribution rather than historical price levels. The assumption is that the selected distribution captures or reasonably approximates price behavior of the modeled securities.

A Monte Carlo simulator uses random numbers to simulate the real world. A Monte Carlo VaR model using the following sequence of steps

1. Generate randomly simulated prices
2. Calculate daily return series
3. Repeat the steps in the historical simulation method described below

Figure 3.4 Montecarlo Simulation



Source: https://www.ibm.com/topics/monte-carlo-simulation

3.3 Stress Testing

Stress testing is a type of risk assessment that measures how well a system or entity holds up under extreme or adverse conditions. The goal of stress testing is to determine the maximum amount of stress a system can handle before it breaks down or fails. This testing method is often used in finance, banking, software development, and engineering.

In financial institutions, stress testing is a method used to gauge the resilience of banks, financial systems, or portfolios against adverse economic scenarios. Financial stress tests simulate events such as an economic downturn, a stock market crash, or a bank default to determine the impact of these events on the financial system.

In the banking industry, stress tests help in identifying potential weaknesses and vulnerabilities that need to be addressed. These tests are especially important in situations where banks have made riskier and more complex investments or have a higher level of debt.

Stress testing is critical in software development and engineering, where it is called performance testing. Performance testing is the process of testing an application or system under high-demand conditions to ensure that it can handle heavy traffic or users. This type of testing determines the

system's responsiveness, stability, reliability, scalability, and speed under normal and stressful conditions.

Stress testing could also be applied in physical or biological systems, for instance, determine the maximum weight that can be supported by a bridge or to test the safety of a drug by increasing its dosage on a sample sized mammal.

Stress tests are designed to be highly realistic and to simulate a wide variety of scenarios that may lead to the failure of the system. This testing method involves pushing the system to its limits to determine its breaking point. Stress testing uncovers potential issues that would not be found in normal operating conditions, which might go unnoticed during simple user acceptance testing.

Stress tests in the banking industry are often required by regulatory agencies to assess the overall stability of financial institutions. In the wake of the 2008 global financial crisis, banking regulators began to require stress tests for banks to ensure that they had adequate capital reserves to withstand a severe economic downturn.

Stress tests in software development are typically conducted in a separate environment called a test environment, which is isolated from the live or production environment. The test environment allows developers to carry out rigorous testing without affecting the system's performance in the live environment.

There are two primary types of stress testing: quantitative and qualitative. Quantitative stress testing involves the use of mathematical and statistical models to determine the impact of a specific scenario on a system or entity. Quantitative stress tests result in numerical outputs, such as the chances of a system failing under specific conditions. These tests are often used in the banking industry to determine the level of capital that a bank needs to hold to withstand a specific scenario.

Qualitative stress testing involves the use of expert opinion and judgment to assess the impact of a specific scenario on a system or entity. Qualitative stress tests evaluate the qualitative aspects of stress testing, such as how scenarios might affect customers and how long-term or systemic issues could arise from an adverse event.

In summary, stress testing is an essential risk assessment tool used to evaluate the resilience of a system or entity under extreme or adverse conditions.

Chapter 4: Analysis and Interpretation

4.1 Beta Interpretation

Beta is measure of uncertainty, or systematic risk, of a security or a portfolio in contrast with the market all in all. Beta is utilized as a part of the capital resource estimating model (CAPM), which computes the normal return of a benefit in view of its beta and expected market returns The below table helps in analyzing the beta value and also help in interpreting beta value.

Beta Value	Interpretation	Risk
β <0:	"If the movement of stock is in opposition to the market in a backwards relationship. As the market expands, the estimation of this stock is required to diminish. While this relationship hypothetically exists, few stocks have a negative beta".	**Less Riskier**
β =0:	"The stock's profits are irrelevant to market moves".	**Less Riskier**
0< β <1:	"The stock is relied upon to move more gradually than the market. On the off chance that the market rises, this stock ought to likewise rise yet not as definitely as the market; in like manner if the market falls, this stock is required to be more unpredictable than the market"	**Less Riskier**
β =1:	"The stock ought to move in a way fundamentally the same as the market in general".	**Reasonably Riskier**
β >1:	"The stock has turned out to be more unpredictable than the market. As the market rises, this stock ought to ascend at a higher rate. In like manner, a more serious misfortune is expected in the occasion the market falls".	**More Riskier**

Table:4.1 Beta Interpretation

4.2 Correlation Interpretation

Correlation refers to the statistical relationship between two variables, indicating how closely they are related. This relationship can be positive, meaning that when one variable increases, the other variable also increases. Alternatively, it can be negative, meaning that when one variable increases, the other variable decreases. The strength of the correlation can be measured using correlation coefficients, which range from -1 to +1, with 0 indicating no correlation and a value of 1 or -1 indicating a perfect positive or negative correlation, respectively. Correlation is often used in research to explore the relationship between different variables and to make predictions about future outcomes.

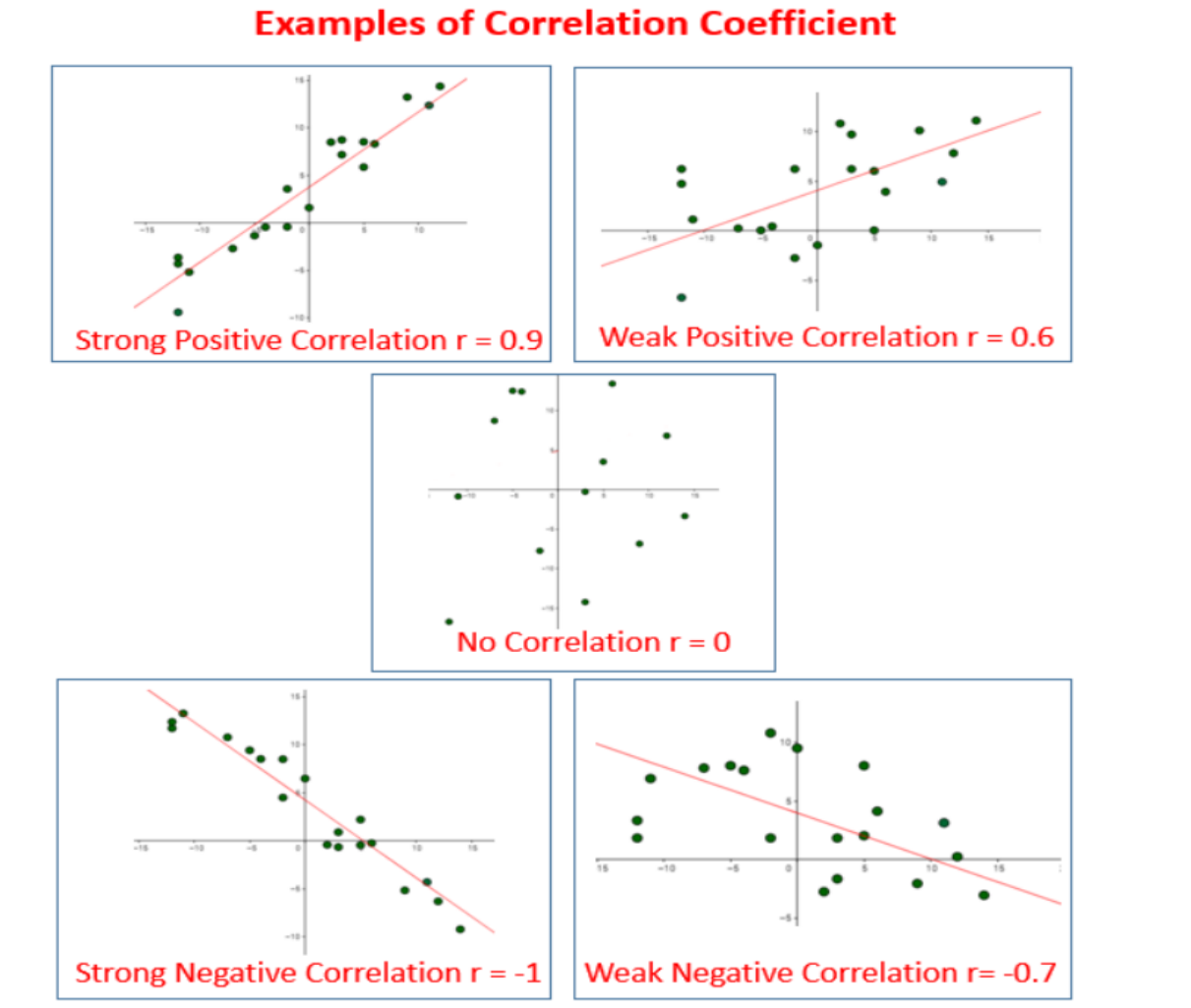


Figure:4.2 Correlation Interpretation

4.3 Nifty 50 Index Analysis

NIFTY 50

Nifty 50 is the leading stock index in India, comprising the top 50 companies listed on the National Stock Exchange (NSE). The Nifty 50 index is considered to be an important benchmark for the Indian equity market, representing the performance of the country's largest and most liquid companies across various sectors.

The Nifty 50 index was launched in April 1996 by the NSE, with a base value of 1000 points. Since then, the index has significantly grown in value to over 15000 points as of 2021. The index is widely used by investors, traders, and fund managers to track the performance of the Indian stock market, and to make investment decisions based on the index's movements.

Some of the companies included in the Nifty 50 index are Tata Consultancy Services Limited (TCS), Reliance Industries Limited, HDFC Bank Limited, Infosys Limited, ICICI Bank Limited, and Hindustan Unilever Limited, among others. These companies represent various sectors of the Indian economy, including information technology, banking and finance, consumer goods, healthcare, and energy.

The Nifty 50 index is calculated using a free float market capitalization-weighted method, where the total market value of the companies in the index is calculated based on the number of shares that are available for public trading, and the market price of these shares. This method ensures that the larger companies in the index have a greater influence on the index's movements compared to smaller companies.

The Nifty 50 index is also revised periodically to ensure that it remains representative of the market's performance. The index is rebalanced twice a year, in March and September, where companies are added or removed based on their size, liquidity, and other criteria.

Investing in the Nifty 50 index provides investors with exposure to a diversified portfolio of top-performing companies in India. This reduces the risk of having all investments in a single company or sector, as the index encompasses a wide range of sectors of the Indian economy. This also provides investors with an easy and cost-effective way to track the performance of the Indian stock market, instead of investing in individual companies.

There are several ways for investors to invest in the Nifty 50 index, including exchange-traded funds (ETFs) and index funds that track the index's performance. These funds provide investors with the

flexibility to invest in the Nifty 50 index across various investment horizons, while also being cost-effective and convenient.

The Nifty 50 index has been a significant driver of the Indian economy's growth in the last couple of decades, with Indian companies becoming more competitive globally. The index's steady growth reflects India's emergence as a major global economic powerhouse, with its vast population and significant consumer base, offering investors the potential for significant long-term growth opportunities.

In conclusion, the Nifty 50 index is a critical part of the Indian stock market, comprising the largest and most liquid companies from various sectors. It provides investors with an easy and cost-effective way to track the performance of the Indian stock market and offers significant long-term growth opportunities. Investing in the Nifty 50 index provides investors with exposure to a diverse range of top-performing companies, reducing the risk of having all investments in a single company or sector.

Sample Data:

Date	Adj Close
07-04-2015	8660.299805
08-04-2015	8714.400391
09-04-2015	8778.299805
10-04-2015	8780.349609
13-04-2015	8834
15-04-2015	7500
16-04-2015	8706.700195
17-04-2015	8606
20-04-2015	8448.099609
21-04-2015	8377.75
22-04-2015	8429.700195
23-04-2015	8398.299805
24-04-2015	8305.25
27-04-2015	8213.799805
28-04-2015	8285.599609
29-04-2015	8239.75
30-04-2015	8181.5

Table: 4.2 Nifty Index Price

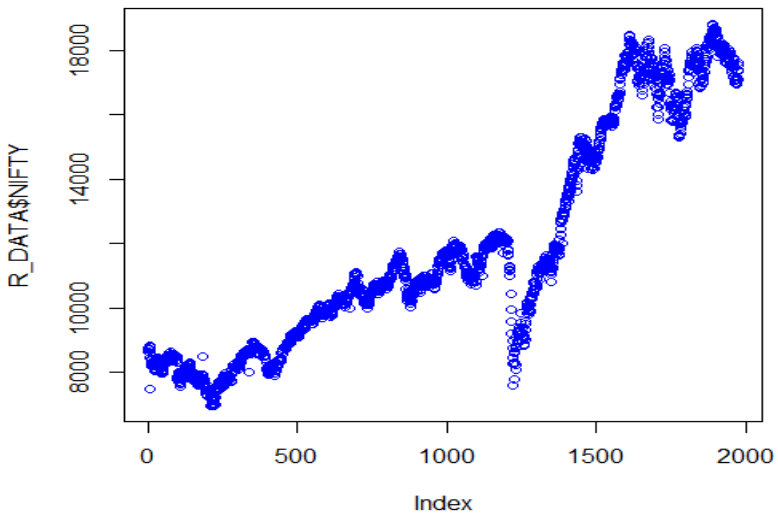
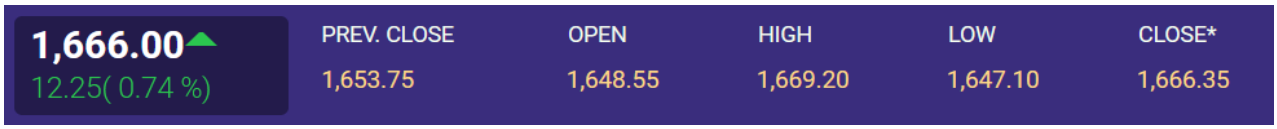


Figure: 4.3 Nifty Price Movement

4.4 HDFC BANK VAR Analysis



HDFC Bank is one of the leading private sector banks in India with its headquarters in Mumbai, Maharashtra. The bank was established in 1994 and is well-known for its wide range of financial products and services catering to the diverse needs of its customers. It offers various services including personal banking, corporate banking, and treasury services, among others.

HDFC Bank has more than 5,326 branches and over 13,000 ATMs spread across 2,768 cities and towns in India as of March 2021. The bank has a strong foothold in the Indian banking sector with a market share of about 11% in total deposits and advances, as of December 2020.

The Bank has won several awards and recognitions for its innovative services and customer-centric approach, making it one of the preferred banks for customers in India. HDFC Bank is known for its cutting-edge technology, superior customer service, and hassle-free banking experience.

Date	Adj Close	Adj Close	HDFC Return	Nifty 50 Return
07-04-2015	489.744354	8660.299805		
08-04-2015	491.072144	8714.400391	0.002707521	0.00622753
09-04-2015	500.8172	8778.299805	0.019650114	0.0073058
10-04-2015	494.439056	8780.349609	-0.012817264	0.00023348
13-04-2015	492.613403	8834	-0.003699206	0.00609168
15-04-2015	489.222687	7500	-0.006906916	-0.16370489
16-04-2015	488.274292	8706.700195	-0.001940457	0.14918984
17-04-2015	482.868256	8606	-0.011133467	-0.01163323
20-04-2015	476.632324	8448.099609	-0.01299847	-0.01851811
21-04-2015	475.636475	8377.75	-0.00209153	-0.00836213
22-04-2015	480.426025	8429.700195	0.010019408	0.00618182
23-04-2015	480.615753	8398.299805	0.000394838	-0.00373192
24-04-2015	477.272491	8305.25	-0.006980513	-0.01114143
27-04-2015	476.798279	8213.799805	-0.000994081	-0.01107220
28-04-2015	476.37149	8285.599609	-0.000895515	0.00870337
29-04-2015	470.965454	8239.75	-0.011413246	-0.00554901
30-04-2015	468.902679	8181.5	-0.004389506	-0.00709449
04-05-2015	474.664368	8331.950195	0.012212721	0.01822038
05-05-2015	468.3573	8324.799805	-0.013376494	-0.00085855

Table: 4.4 HDFC Bank and Nifty 50 Price

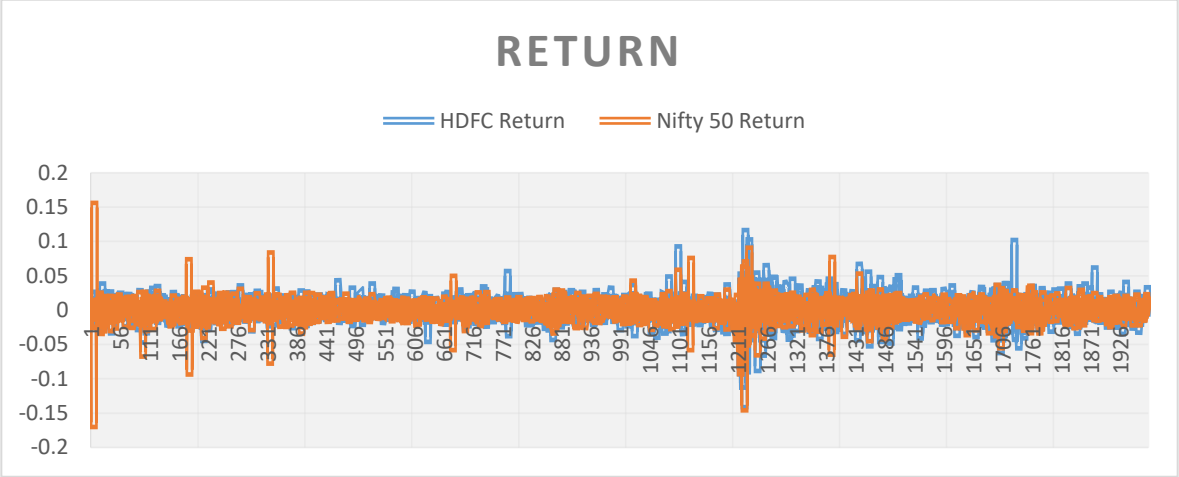


Figure: 4.4 HDFC AND NIFTY 50 Return

Beta	**0.576052**
Correlation	**0.650225**

- A beta greater than 1.0
- Suggests that the stock is more volatile than the broader market, and a beta less than 1.0 indicates a stock with lower volatility.
- Here Beta is 0.576052 which indicates HDFC BANK stock is less volatile.
- Correlation of 0.65 indicates that there is weak positive correlation between NIFTY 50 INDEX and HDFC BANK.

Historical Simulation

Historical simulation value at risk (HSVaR) is a risk measurement methodology that relies on the analysis of past market data to estimate the potential losses of a portfolio of assets over a certain time horizon.

The methodology involves the creation of a set of historical scenarios by selecting a sample of past periods that are considered representative of the current market conditions. The portfolio is then revalued under each scenario, and the worst case scenario is used to estimate the VaR.

HSVaR has the advantage of being a simple methodology that requires only historical pricing data and basic statistical analysis. However, it can also be criticized for being too reliant on the past and

not taking into account changes in the market environment, such as the impact of new regulations or the introduction of new financial instruments.

Overall, HSVaR is a useful tool for estimating the potential losses of a portfolio over a specified time horizon and can be a valuable component of a comprehensive risk management strategy.

The main advantages of using this method are:

- Simple to understand
- Easy to implement
- Intuitive
- Data driven
- No underlying distribution of the data is required
- Only a lookback window size needs to be selected.

Steps in Calculating VAR of HDFC BANK by Historical Simulation:

1) Calculate NIFTY 50 INDEX Return and HDFC BANK STOCK return by using lognormal function as this will consider TIME VALUE OF MONEY.

Ln(Present Price/Previous Price)

2) Calculate BETA between two returns to find a relation between two returns.
3) As Historical Simulation is based on fact that future will follow past so we assume past 1977 returns as our future return.
4) Multiply these index returns by BETA to find HDFC BANK stock return.
5) Then calculate GAIN/LOSS by multiplying most recent stock price.
6) For Calculating VAR Percentile function of excel has been used.

Percentile (array, 1-confidence interval)

Confidence Interval = 95%

Significance Level = 1-95% = 0.05%

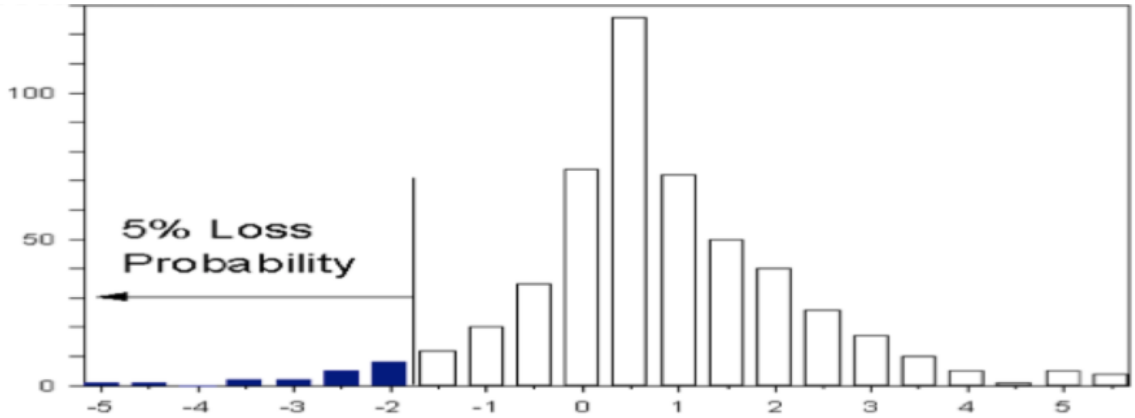


Figure:4.5 Value at Risk at 95% CI.

Historical Simulations					
	Nifty 50 Return	Stock Return	Gain/Loss		
1	0.006227533	0.003587383	5.977801	VAR	-15.7745
2	0.00730587	0.004208562	7.012895		
3	0.000233481	0.000134497	0.224118		
4	0.006091688	0.003509129	5.847403		
5	-0.163704893	-0.094302546	-157.14		
6	0.149189846	0.085941123	143.2071		
7	-0.011633232	-0.006701348	-11.1667		
8	-0.018518117	-0.0106674	-17.7755		
9	-0.008362136	-0.004817026	-8.0268		
10	0.006181825	0.003561053	5.933926		
11	-0.003731926	-0.002149784	-3.58227		
12	-0.011141436	-0.006418048	-10.6946		
13	-0.011072202	-0.006378165	-10.6282		
14	0.008703378	0.005013599	8.354361		
15	-0.005549017	-0.003196523	-5.32649		

Table:4.5 VAR Using Historical Simulation

Monte Carlo Simulation

Monte Carlo simulation is a statistical method that is used to estimate the value at risk (VaR) of an investment. VaR is a risk management tool that is used to estimate the potential losses that an investment portfolio may experience over a specified time frame.

Monte Carlo simulation involves the generation of many random scenarios that pertain to the investment portfolio. These scenarios are generated using various statistical methods, such as normal or lognormal distributions, to simulate the returns of various assets. The results of these simulations are then used to estimate the likelihood of different loss scenarios occurring within the investment portfolio.

For example, if we run a Monte Carlo simulation for an investment portfolio of $1,000,000 over a one-year period and find that there is a 5% chance of losing $50,000 or more, then the VaR for this portfolio is $50,000.

Monte Carlo simulation is a powerful tool for estimating VaR, as it takes into account the potential impact of multiple variables and scenarios that may affect the investment portfolio. It is, however, important to note that Monte Carlo simulation results are based on statistical probabilities and are not a guarantee of future performance.

Steps in Calculating VAR of HDFC BANK by Monte Carlo Simulation:

1) **Calculate Mean and Standard Deviation of NIFTY 50 Index.**
2) **Generate 1977 random numbers (probability) using RAND() function in excel.**
3) **Calculate return by using NORMINV function.**

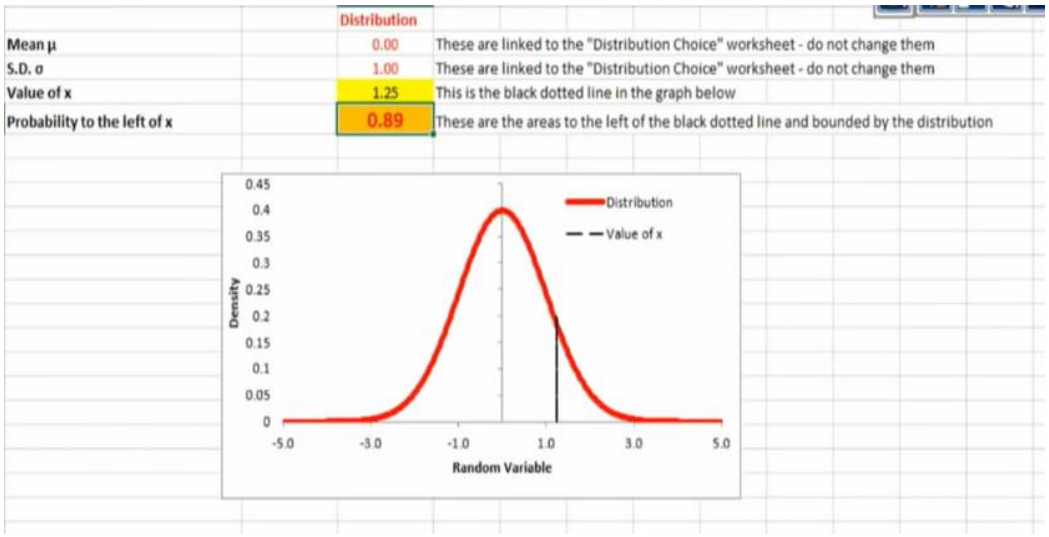


Figure:4.6 Normal Distribution Curve

Montecarlo Simulation						
Mean	**0.000359**	**SD**	**0.012992**	**Gain/loss**		
1	0.882067	0.015759	0.009078	15.12704	**VAR**	**-20.3422**
2	0.515435	0.000861	0.000496	0.826914		
3	0.875506	0.015336	0.008834	14.72083		
4	0.722459	0.008026	0.004623	7.704127		
5	0.388873	-0.00331	-0.00191	-3.17571		
6	0.574136	0.002787	0.001605	2.675283		
7	0.214857	-0.0099	-0.0057	-9.50373		
8	0.219598	-0.00969	-0.00558	-9.30256		
9	0.483071	-0.00019	-0.00011	-0.18508		
10	0.174248	-0.01182	-0.00681	-11.3473		
11	0.843337	0.013458	0.007752	12.91828		
12	0.656778	0.005603	0.003228	5.378587		
13	0.92984	0.019516	0.011243	18.73385		

Table:4.6 VAR using Montecarlo Simulation

Result and Findings:

						VAR	
S.No	Name	Type	Industry	NSE	BETA	Historical	Monte Carlo
1	HDFC Bank	Public	Banking, Financial Services	HDFCBANK	0.58	-15.77	-20.53
2	ICICI	Public	Banking, Financial Services	ICICIBANK	0.38	-5.51	-6.87
3	TCS	Public	IT services, IT consulting	TCS	0.35	-18.85	-24.62
4	ITC	Public	Conglomerate	ITC	0.33	-96.69	-127.96

Table: 4.7 Overall Result

CORRELATION TABLE

	Nifty 50 Return	HDFC Return	ICICI RETURN	TCS RETURN	ITC Return
Nifty 50 Return	1				
HDFC Return	0.650225195	1			
ICICI RETURN	0.624475832	0.530728303	1		
TCS RETURN	0.406444162	0.269274436	0.217499215	1	
ITC Return	0.422402368	0.317848134	0.309234553	0.193308092	1

Table:4.8 Correlation Table

- Beta of Bank Nifty and HDFC Bank is 0.58 which means when Nifty 50 increase by 1 unit HDFC Bank increases by 0.58.
- The Maximum possible loss on HDFC Bank that can happen tomorrow at 95% Confidence interval is 15.77 using historical simulation and 20.53 using monte carlo simulation.
- HDFC Bank has highest correlation among selected stocks.

Chapter 5 - Conclusion

Understanding risk and return is crucial for investors to make informed investment decisions. A thorough understanding of these concepts helps investors evaluate the potential risks associated with different investments and determine whether the reward is worth the risk.

Risk and return are interconnected, and investors demand higher returns to compensate for taking on greater risks. The trade-off between risk and return is a fundamental principle of finance, where investors will only invest in a high-risk investment if they expect higher returns to compensate for the risk involved. For example, stocks are generally riskier than bonds, and investors demand higher returns for investing in stocks than in bonds.

Investors use various tools, such as risk-adjusted returns, to assess the risk and return profiles of different investments. Risk-adjusted returns help investors compare the performance of different investments while taking into account the risk levels associated with each.

In summary, risk and return are crucial concepts that underpin the investment decision-making process. By understanding the relationship between these two variables, investors can make informed decisions that balance their desired level of risk with their potential rewards.

Among the 4 selected stocks HDFC BANK, TCS, ICICI, ITC we can see that Beta of HDFC is more than other by which we can say that HDFC BANK return somewhat can be predicted by NIFTY 50 index movement.

Correlation table shows that HDFC BANK and ICICI have higher correlation in comparison to others which shows their movement in price can be predicted by index movement.

Value at Risk is a statistical measure that provides a quantifiable estimate of the potential loss that an investment portfolio may incur within a specific time period. VaR is a function of three main components, namely the portfolio's standard deviation, the time horizon, and the confidence level. VaR can be calculated using different methods, including historical simulation, and Monte Carlo simulation. In this project VAR has been calculated for all 4 stock at 95% confidence interval to know what is the maximum loss an investor can face tomorrow.

Limitations

- Dataset contains Covid – 19 period which is abnormal condition.
- VAR works only when dataset is normally distributed that is under normal condition.
- The estimation methods used for standard VaR models have problems for measuring extreme price movements.
- They assume that the asset returns follow a normal distribution. So they disregard the fat-tailed properties of actual returns, and underestimate the likelihood of extreme price movements.
- On the other hand, the concept of VaR as a risk measure has problems for measuring extreme price movements. By definition, VaR only measures the distribution quantile, and disregards extreme losses beyond VAR.

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Annexure

Date	Adj Close	Adj Close	HDFC Return	Nifty 50 Return
07-04-2015	489.744354	8660.299805		
08-04-2015	491.072144	8714.400391	0.002707521	0.006227533
09-04-2015	500.8172	8778.299805	0.019650114	0.00730587
10-04-2015	494.439056	8780.349609	-0.012817264	0.000233481
13-04-2015	492.613403	8834	-0.003699206	0.006091688
15-04-2015	489.222687	7500	-0.006906916	-0.163704893
16-04-2015	488.274292	8706.700195	-0.001940457	0.149189846
17-04-2015	482.868256	8606	-0.011133467	-0.011633232
20-04-2015	476.632324	8448.099609	-0.01299847	-0.018518117
21-04-2015	475.636475	8377.75	-0.00209153	-0.008362136
22-04-2015	480.426025	8429.700195	0.010019408	0.006181825
23-04-2015	480.615753	8398.299805	0.000394838	-0.003731926
24-04-2015	477.272491	8305.25	-0.006980513	-0.011141436
27-04-2015	476.798279	8213.799805	-0.000994081	-0.011072202
28-04-2015	476.37149	8285.599609	-0.000895515	0.008703378
29-04-2015	470.965454	8239.75	-0.011413246	-0.005549017
30-04-2015	468.902679	8181.5	-0.004389506	-0.007094496
04-05-2015	474.664368	8331.950195	0.012212721	0.018222038
05-05-2015	468.3573	8324.799805	-0.013376494	-0.000858558
06-05-2015	460.271912	8097	-0.017414038	-0.027745365
07-05-2015	451.119568	8057.299805	-0.020085006	-0.004915134
08-05-2015	465.677979	8191.5	0.031761941	0.016518543
11-05-2015	469.613953	8325.25	0.008416618	0.016196034

12-05-2015	460.91217	8126.950195	-0.018703476	-0.024107342
13-05-2015	469.590271	8235.450195	0.018653046	0.013262307
14-05-2015	469.969574	8224.200195	0.000807406	-0.001366979
15-05-2015	469.519073	8262.349609	-0.000959035	0.004627952
18-05-2015	478.884796	8373.650391	0.019751137	0.013380914
19-05-2015	477.794128	8365.650391	-0.002280114	-0.000955835
20-05-2015	485.618744	8423.25	0.016243894	0.006861657
21-05-2015	485.92688	8421	0.000634321	-0.000267153
22-05-2015	485.737244	8458.950195	-0.000390332	0.004496489
25-05-2015	485.381561	8370.25	-0.000732522	-0.010541323
26-05-2015	487.207306	8339.349609	0.003754407	-0.003698524
27-05-2015	492.305115	8334.599609	0.010408965	-0.000569751
28-05-2015	488.155731	8319	-0.008464201	-0.001873422
29-05-2015	498.185364	8433.650391	0.020337749	0.013687647
01-06-2015	491.380371	8433.400391	-0.01375371	-2.96436E-05
02-06-2015	478.386871	8236.450195	-0.026798756	-0.023630609
03-06-2015	476.845703	8135.100098	-0.003226794	-0.012381404
04-06-2015	481.303345	8130.649902	0.009304761	-0.000547186
05-06-2015	479.785889	8114.700195	-0.003157786	-0.001963603
08-06-2015	475.849884	8044.149902	-0.008237505	-0.008732149
09-06-2015	475.091125	8022.399902	-0.001595807	-0.00270749
10-06-2015	481.611572	8124.450195	0.013631294	0.012640441
11-06-2015	474.308685	7965.350098	-0.015279578	-0.019777161
12-06-2015	478.552917	7982.899902	0.00890845	0.002200845
15-06-2015	476.679749	8013.899902	-0.003921914	0.00387578
16-06-2015	478.197296	8047.299805	0.003178521	0.004159085

17-06-2015	476.442596	8091.549805	-0.003676155	0.005483676
18-06-2015	483.508392	8174.600098	0.014721426	0.010211515
19-06-2015	488.677368	8224.950195	0.010633821	0.006140443
22-06-2015	496.573029	8353.099609	0.016028068	0.015460439
23-06-2015	498.92041	8381.549805	0.004716024	0.003400158
24-06-2015	495.932831	8360.849609	-0.006006088	-0.002472789
25-06-2015	505.03775	8398	0.018192683	0.004433532
26-06-2015	504.018097	8381.099609	-0.002021005	-0.002014458
29-06-2015	501.078033	8318.400391	-0.005850331	-0.007509148
30-06-2015	506.057343	8368.5	0.009888146	0.006004681
01-07-2015	508.523254	8453.049805	0.004860956	0.010052643
02-07-2015	505.584808	8444.900391	-0.00579515	-0.000964545
03-07-2015	513.253174	8484.900391	0.015053445	0.004725404
06-07-2015	517.672729	8522.150391	0.008574005	0.004380543
07-07-2015	519.273254	8510.799805	0.003087	-0.00133278
08-07-2015	510.673218	8363.049805	-0.016700355	-0.017512753
09-07-2015	513.157776	8328.549805	0.004853463	-0.004133822
10-07-2015	521.136597	8360.549805	0.015428836	0.003834843
13-07-2015	523.716675	8459.650391	0.004938652	0.011783657
14-07-2015	521.662109	8454.099609	-0.003930764	-0.000656363
15-07-2015	523.979309	8523.799805	0.004432119	0.008210743
16-07-2015	532.579285	8608.049805	0.016279582	0.009835561
17-07-2015	530.596558	8609.849609	-0.003729824	0.000209062
20-07-2015	532.842102	8603.450195	0.004223182	-0.000743543
21-07-2015	524.62439	8529.450195	-0.015542577	-0.008638404
22-07-2015	532.436035	8633.5	0.014780209	0.012125081

23-07-2015	529.330444	8589.799805	-0.005849874	-0.005074555
24-07-2015	529.306519	8521.549805	-4.51996E-05	-0.007977204
27-07-2015	523.573242	8361	-0.010890766	-0.019020189
28-07-2015	529.617126	8337	0.011477413	-0.002874598
29-07-2015	529.54541	8375.049805	-0.00013542	0.004553585
30-07-2015	530.596558	8421.799805	0.001983033	0.005566534
31-07-2015	531.122131	8532.849609	0.000990042	0.013099816
03-08-2015	523.358215	8543.049805	-0.014725844	0.001194689
04-08-2015	519.082031	8516.900391	-0.008204227	-0.003065593
05-08-2015	521.829285	8567.950195	0.005278568	0.005976049
06-08-2015	523.620972	8588.650391	0.003427593	0.002413089
07-08-2015	522.044373	8564.599609	-0.003015497	-0.002804226
10-08-2015	522.999878	8525.599609	0.001828641	-0.004564027
11-08-2015	523.023804	8462.349609	4.57466E-05	-0.007446489
12-08-2015	511.437592	8349.450195	-0.022401409	-0.013431175
13-08-2015	514.829834	8355.849609	0.006610858	0.000766154
14-08-2015	526.416016	8518.549805	0.022255378	0.01928427
17-08-2015	521.494934	8477.299805	-0.009392245	-0.004854136
18-08-2015	519.034302	8466.549805	-0.004729587	-0.001268897
19-08-2015	516.884277	8495.150391	-0.00415096	0.003372376
20-08-2015	513.46814	8372.75	-0.006631031	-0.014513074
21-08-2015	507.06601	8299.950195	-0.01254679	-0.008732871
24-08-2015	486.879852	7809	-0.04062381	-0.0609726
25-08-2015	486.593201	7880.700195	-0.000588924	0.009139842
26-08-2015	484.22821	7791.850098	-0.004872154	-0.011338429
27-08-2015	488.337036	7948.950195	0.008449511	0.019961541

28-08-2015	491.13208	8001.950195	0.005707279	0.006645417
31-08-2015	490.893188	7971.299805	-0.000486529	-0.00383772
01-09-2015	477.825958	7785.850098	-0.026980003	-0.02353957
02-09-2015	475.460968	7717	-0.004961769	-0.008882309
03-09-2015	482.69928	7823	0.015109059	0.013642425
04-09-2015	475.8909	7655.049805	-0.014205225	-0.021702577
07-09-2015	470.348694	7558.799805	-0.011714305	-0.012653114
08-09-2015	479.713165	7688.25	0.019714031	0.016980768
09-09-2015	485.565948	7818.600098	0.012126761	0.016812334
10-09-2015	483.033752	7788.100098	-0.005228583	-0.003908583
11-09-2015	482.79483	7789.299805	-0.00049475	0.000154032
14-09-2015	487.190369	7872.25	0.009063167	0.010592945
15-09-2015	484.060944	7829.100098	-0.006444132	-0.005496344
16-09-2015	488.934296	7899.149902	0.0100173	0.008907573
18-09-2015	501.547638	7981.899902	0.025470477	0.01042132
21-09-2015	503.076538	7977.100098	0.003043728	-0.000601517
22-09-2015	492.422119	7812	-0.021406007	-0.020913936
23-09-2015	501.284821	7845.950195	0.01783813	0.004336487
24-09-2015	502.335968	7868.5	0.00209471	0.002869947
28-09-2015	499.947083	7795.700195	-0.004766896	-0.009295122
29-09-2015	508.738159	7843.299805	0.017431203	0.006087315
30-09-2015	510.649292	7948.899902	0.003749576	0.013373903

	Historical Simulations					
	Nifty 50 Return	Stock Return	Gain/Loss			
1	0.006227533	0.003587383	5.977801		VAR	-15.7745
2	0.00730587	0.004208562	7.012895			
3	0.000233481	0.000134497	0.224118			
4	0.006091688	0.003509129	5.847403			
5	-0.163704893	-0.094302546	-157.14			
6	0.149189846	0.085941123	143.2071			
7	-0.011633232	-0.006701348	-11.1667			
8	-0.018518117	-0.0106674	-17.7755			
9	-0.008362136	-0.004817026	-8.0268			
10	0.006181825	0.003561053	5.933926			
11	-0.003731926	-0.002149784	-3.58227			
12	-0.011141436	-0.006418048	-10.6946			
13	-0.011072202	-0.006378165	-10.6282			
14	0.008703378	0.005013599	8.354361			
15	-0.005549017	-0.003196523	-5.32649			
16	-0.007094496	-0.004086799	-6.81			
17	0.018222038	0.010496843	17.49131			
18	-0.000858558	-0.000494574	-0.82413			
19	-0.027745365	-0.015982776	-26.6327			
20	-0.004915134	-0.002831373	-4.71803			
21	0.016518543	0.009515541	15.85613			
22	0.016196034	0.009329759	15.54655			
23	-0.024107342	-0.013887085	-23.1406			
24	0.013262307	0.00763978	12.73047			
25	-0.001366979	-0.000787451	-1.31216			
26	0.004627952	0.002665942	4.442365			
27	0.013380914	0.007708103	12.84432			
28	-0.000955835	-0.00055061	-0.9175			

Montecarlo Simulation						
Mean	**0.000359**	**SD**	**0.012992**	**Gain/loss**		
1	0.65393	0.005503	0.00317	5.282155		**-21.5862**
2	0.755895	0.009364	0.005394	8.988582		
3	0.105554	-0.01589	-0.00915	-15.2508		
4	0.002846	-0.03556	-0.02049	-34.1384		
5	0.835589	0.013045	0.007515	12.52194		
6	0.997859	0.037471	0.021585	35.96872		
7	0.335038	-0.00518	-0.00298	-4.96885		
8	0.112213	-0.01542	-0.00889	-14.8058		
9	0.919738	0.01859	0.010709	17.84479		
10	0.363704	-0.00417	-0.0024	-4.00273		
11	0.599811	0.003644	0.002099	3.497663		
12	0.431058	-0.0019	-0.00109	-1.82166		
13	0.022432	-0.0257	-0.01481	-24.6714		
14	0.031511	-0.02379	-0.01371	-22.8395		
15	0.993572	0.032679	0.018825	31.36881		
16	0.208127	-0.0102	-0.00588	-9.79373		
17	0.33225	-0.00528	-0.00304	-5.06443		
18	0.752468	0.009223	0.005313	8.852897		
19	0.991774	0.031523	0.018159	30.25852		
20	0.680115	0.006439	0.003709	6.180912		
21	0.311926	-0.00601	-0.00346	-5.7714		
22	0.22637	-0.0094	-0.00541	-9.01951		
23	0.437542	-0.00168	-0.00097	-1.61617		
24	0.210675	-0.01009	-0.00581	-9.68331		
25	0.822838	0.012392	0.007139	11.89526		
26	0.993804	0.032849	0.018923	31.53143		
27	0.492389	0.000111	6.38E-05	0.106357		
28	0.474901	-0.00046	-0.00026	-0.44081		

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