



# **A LEARNING OF RISK MANAGEMENT THROUGH DIVERSIFICATION DURING UNCERTAIN MARKET CIRCUMSTANCES:**

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## **Abstract:**

The major aim of Investors and Asset managers of companies is to make better returns at a given predictable return at near risk. In depth study of portfolio administration is performed in accordance with the portfolio examination formed by six freely recorded companies in India. The paper is an endeavour, an event that is productive broadening amid a difficult time working out the Markowitz show. Others, solutions for present portfolio hazard administration for the Indian monetary showcase are discussed. The inquiry about technique centres on applying an advanced portfolio hypothesis, with fundamental accentuation on the Markowitz productive wilderness, hazards, return and portfolio optimization. The information is basically based on the best performing divisions of the Indian economy, and six companies are chosen from each segment to test for enhancement. Key discoveries are that there is a greater chance of being lower than the weighted hazard of the stocks. Therefore, productive expansion is accomplished.

**Key words: Productive broadening, Portfolio optimization, Portfolio hazard and return, t-test.**

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## **INTRODUCTION:**

According to the risk Management strategy, it states that “A wide variety of Investment with in a portfolio contains a mix of different types of assets. In Different types of assets carry different degrees of risk which react differently in given event.

This paper describes risk management through diversification during an uncertain market position, so that we have taken a list of six companies that are choosing from different sectors which to test for enhancement of dubious financial conditions for the pre (2010 – 20) and post crisis periods (2021 – 2022).

Companies with a developing, coordinated worldwide economy and the boom in budgetary markets world over, it has got to be basic for the quickly developing speculator base to get the fine subtleties of the stock advertise, securities that are exchanged and variables that

influence returns on those securities. The simplest term of stock advertising could be a place where buyers and venders of securities (value and obligation) meet in order to arrange and carry out an offering and buy exchanges. The player in the advertisement may either handle their claim accounts or contract specialities for the same. Stock trades to help in the issue and recovery of securities, bonds and other financial rebellious as well as the payment of salary and profits. Each stock showcase encompasses an advertisement list. This file could be the degree of execution that is recorded in the trade. The total esteem delivered by combining a few stocks or other venture vehicles together and communicating them adds up to values against a base esteem from the trade, London stock trade, New York stock trade, bourse de commerce (Paris), Deutsche Bourse and Toronto stock trade, Shanghai stock trade and Bombay stock trade since its beginning five decades prior, numerous ponders have been carried out on advanced portfolio hypothesis which enhancement over different districts and markets can lower the hazard of a venture wicker container for a given return. Enhancement, be it worldwide, sectorial or industry-based expansion, has been the spine of plenty of speculation studies and bases. A really basic hazard administration strategy, enhancement, is frequently befuddled with the term chance administration itself. In any case, with the moderately late coming of globalisation and integration of world economies, the confinement of broadening and its inadequacy in decreasing chance in exceedingly connected and questionable situations cannot be disregarded. Different considerations have appeared about the benefits of universal. This proposal is a broad and point by point of enhancement- its benefits and restrictions. It makes a difference in superior understanding of hazard administration in today's ever changing worldwide financial environment. It too endeavours to discover a few effective, broadening choices in contributions, such as ventures in gold, genuine domain, etc.

## **LITERATURE REVIEW**

Enhancement has been the foremost indispensable procedure utilised for chance administration all over the world. Advertise turbulence in any created economy impacts a few districts of the world, diminishing the benefits of expansion.

Paliwal Udai (2013) examined hazards within the Namibian advertisement and the utilisation of gold, bonds, genuine domain in a portfolio to oversee returns amid dubious times. Wester Field Randolph, in conclusion. Advanced capital hypothesis isolates the causes of changeability in returns of speculations into two components-Orderly and Unsystematic. Efficient inconstancy is the inconstancy in returns of the portfolio inferable due to the changeability within the advertisement returns as an entirety.

Unsystematic inconstancy isn't related to the changeability of the showcase; it is the person's inner hazard of any organisation which can be broadened not at all like the orderly hazard. This paper states, with the assistance of authentic cases, how expanding the number of stocks in your portfolio successfully diminishes the system angle with such a small portfolio.

Supriya Shivnarayan singh(2020) Disrupted economic activity and has caused a recessionary situation. It has also disrupted an economy like India which is set to grow now at a slower

pace for a decade. The stock market reacted very sharply to the increased number of infected populations. Amid all this, Macquarie, a Sydney-based investment bank, is bullish on ten stocks mentioned in this paper. This paper analyses these ten stocks from an investment perspective and shows how a portfolio can be created and use these stocks. This paper, with the help of an optimization model, tries to understand the effect of diversification and find out the optimal number of stocks considering the risk and return.

Further, the research indicated that if financial analysis is done in the right manner, we can analyse investments rigorously and manage portfolios by using Excel and investments. It can be concluded that the returns can be maximised and risks can be minimised by proper investment analysis and creating an optimised portfolio using top ten stock picks even in market turmoil caused due to a pandemic like covid-19.

Ikhlās Gurrib and Saad Alshahrani (2012) Said that the paper looks at the presence of portfolio hazard administration for the UAE Budgetary Showcase. The investigation technique centres on applying Present day Portfolio Hypothesis, with specific accentuation on the Markowitz Productive Wilderness, Least Fluctuation Investigation, and Portfolio Optimization. The information is basically based on the best performing divisions of the UAE economy, and twenty key companies are chosen from each division to test for expansion. Key discoveries recommend that the hazard of the portfolio is lower than the weighted hazard of the twenty-person stocks, i.e., productive expansion can be accomplished.

Robert M. Tamiso & Roy S. Freedman (1995), composed from the point of view of a budgetary advisor, addresses the benefits and pitfalls of utilizing modern inventive approaches to stand up to chance in a portfolio in questionable times by consolidating prospects and genuine resources. It appears how conventional time.

## **RESEARCH METHODOLOGY**

### **PURPOSE OF STUDY**

Broadening is an amazingly valuable apparatus for chance decrease in portfolios. So much so, the term is some of the time incorrectly considered synonymous with hazardous administration. All learned speculators accept differentiating their bushel of securities in arrange to produce the most extreme return and by bearing the least hazard conceivable. Nowadays, in any case, with the broad globalization and integration of economies, the impact of expansion decreases amid the terrible Financial Times as the economies of all countries are hit at the same time. Expansion is ill-suited for misfortune control in extreme showcase downturns. These pondering points demonstrate this over-explanation. It, too, endeavours to discover a few elective ventures amid questionable times when contributing to value isn't practical, such as contributing in gold, genuine bequest, etc.

### **Objectives of the Study:**

The most destinations to ponder are:-

1. To analyse and get the Risk-Return direct relationship.

2. To achieve this expansion in portfolios and the diminishment in hazard related to it subsequently.
3. To get it and discover security returns with tall hazard amid awful advertise conditions amid steady financial conditions.
4. To analyse and see the significance of differentiating amongst diverse resource classes amid questionable times.

### **Source of Data and Data Collection:**

In arranging to create the least chance portfolio, 6 companies whose stocks exchange within the Bombay Stock Trade were chosen. With the intension of shaping an ideal broadened portfolio, the stocks were chosen from three different and unmistakable businesses of the Indian economy, i.e., Keeping money, Media transmission and Framework and Development. These six companies were:

#### **A. Banking**

- 1) Housing Improvement Fund Corporation (HDFC)
- 2) Industrial Credit and Speculation Enterprise of India

#### **B. Telecommunication**

- 1) Bharti Airtel
- 2) Reliance communications

#### **C. Infrastructure and Construction**

- 1) Larsen and Toubro
- 2) Jaiprakash Associates

Verifiable stock costs of the desired companies were extricated from the cash control site. The authentic Sensex returns required to calculate the advertising return were extricated from the Bombay Stock Trade site. The 91-day T-bill rates for the long time in address utilized to calculate the free rate of return was extricated from the Banks website.

The investigation plan utilized in this thing is exploratory as well as causal in nature. Exploratory Investigation: Auxiliary information was collected and analysed for the reason of calculating and considering the pre-crisis and post-crisis portfolio returns. This examination drove us to the conclusion that the post-crisis returns were altogether lower than the pre-crisis returns. Exploratory inquiries about coming about made a difference as we defined the most speculation of our ponder.

Causal Inquire about: A speculation was surrounded to test whether or not there's a critical distinction in portfolio return through expansion in questionable times. This theory was tried utilizing the t-test of likelihood dispersion. For the pre-crisis period, the month to month returns of companies over a period of one year (2021-2022) are utilized to compute their log returns. These log returns of the 6 companies are utilized to calculate their cruel

genuine return, their Fluctuation and STANDARD DEVIATION. Of the 6 companies in address, we shortlisted fair 3 based on capitalization and risk and return.

- HDFC
- BHARTI AIRTEL
- LARSEN & TOUBRO

### **Hypothesis Framed**

In arranging to test the effect of the budgetary emergency on the built portfolios, we tried the portfolio returns by utilizing the t-test of likelihood dissemination. The level of importance utilized was 5%. And the test was one followed. This was also accomplished utilizing the assistance of Microsoft Exceed expectations.

The hypothesis was:

HO: there's no critical distinction in portfolio return through enhancement in dubious times.

Ha: there's a noteworthy contrast in portfolio returns through enhancement in questionable times.

### **Calculation of expected return:**

We have produced genuine chronicled returns. In any case, in arranging to create the ideal least change portfolio utilizing these three weights, I require the anticipated return of all three stocks. Typically accomplished by utilizing the CAPM (Capital Resource Estimating Show)

$$E(R) = R_m + (R_m - R_f) \beta$$

Where?

$R_m$  = Market/ Sensex return over the year 2006-07

$R_f$  = Risk free return that the government issued treasury bills generated over 2006-07

$\beta$  = Sensitivity of the individual stock returning to the market.

The verifiable Sensex returns utilized were extricated from the BSE site. The 91-day Treasury charge yields were extricated from the central bank (Save Bank of India's) website.

Beta is calculated using the formula

$$\text{Co-variance} = (\text{market log returns, stock log returns}) / \text{variance (market log returns)}$$

Following, in arranging to create the ideal portfolio, I doled out 3 combinations of weights for those three stocks and chose the combination which created the greatest portfolio return. Advancement of the covariance network of these three stocks has been calculated for the post emergency period (2009-2010). Moreover, the same technique was utilized to create the ideal portfolio return and risk.

## Measuring Risk

The foremost common measures of calculating hazard are standard deviation of the authentic returns or normal returns of a particular speculation. A tall standard deviation demonstrates a tall degree of hazard.

Standard deviation:

$$\begin{aligned} & \sqrt{E[(X - \mu)^2]} \\ & \sqrt{E[X^2] + E[(-2\mu X)] + E[\mu^2]} \quad \sqrt{E[X^2 - 2\mu E[X] + \mu^2]} \\ & \sqrt{E[X^2] - 2\mu^2 + \mu^2} \quad \sqrt{E[X^2] - \mu} \\ & = \sqrt{E[X^2] - (E[X])^2} \end{aligned}$$

Where?

X = variable

E(X) = random expected value of X  $\mu$  = mean value of X

Enhancement and its significance in portfolio building:

The term portfolio alludes to any collection of monetary resources such as stocks, bonds, and cash. Portfolios may be held by personal speculators and/or overseen by money-related experts, fence stores, banks and other budgetary funds. It could be a, for the most part, acknowledged guideline that a portfolio is planned agreeing to the investor's chance resistance, time outline and speculation goals. For any well-overseen portfolio, one of the foremost essential contemplations to be kept in intellect is the concept of Broadening. Thinks have appeared that keeping up a well-diversified portfolio of 25 to 30 stocks will yield.

The most cost-effective level of hazard, contributing to more security, will still encourage broadening benefits, but at a definitely small rate. Thus, enhancement is a basic portion of portfolio building. A well-diversified portfolio is one in which the constituent stocks are adversely connected. Usually, since on the off chance that all the securities included in a portfolio are emphatically connected to each other's cost developments and subsequently move within the same heading, at that point, when the showcase faces monetary discouragement, all the securities would at the same time underperform. This would by default lead to the arrangement of an exceedingly hazardous portfolio.

## DATA OUTPUT AND ANALYSIS

**Table 1**  
**Pre-Crisis Portfolio Construction**

	Expected return	Weights (1)	Weighted Return	Weights (2)	Weighted return	Weights (3)	W weighted Return
<b>HDFC</b>	18.78	70%	09.555	10%	4.378	29%	4.871
<b>AIRTEL</b>	14.25	40%	2.555	50%	7.778	28%	3.874
<b>L&amp;T</b>	12.54	10%	4.28	10%	2.89	30%	4.588
<b>E(r)</b>			14.56		13.58		13.28

### Interpretation:

Three portfolios were developed for the taking after stocks: • HDFC • BHARTI AIRTEL • LARSEN AND TOUBRO, utilizing distinctive combinations of weights. In the primary portfolio (portfolio A) the taking after weights were utilized for the over stocks: 60%, 20%, 20%. By utilizing the weighted normal strategy, anticipated return for portfolio A was 16.732% Additionally, for portfolio B and C the weighted normal returns were 15.63 and 16.22 separately. The primary portfolio which gave HDFC the most elevated weight produced the greatest portfolio return and was utilized as the ideal portfolio to calculate the risk.

**Table 2**  
**Post-Crisis Portfolio Return**

	Expected return	Weights (1)	Weighted Return	Weights (2)	Weighted return	Weights (3)	W Weighted Return
<b>HDFC</b>	3.879	10%	0.789	30%	1.589	22%	0.258
<b>AIRTEL</b>	3.589	10%	0.879	10%	0.578	22%	0.557
<b>L&amp;T</b>	4.258	80%	2.478	10%	2.488	28%	1.88
<b>E(r)</b>			3.55		2.25		3.58

### Interpretation:

The same three least change stocks were utilized to build three diverse weight portfolios for the post-crisis period (2019-2020). Within the to begin with portfolio (portfolio A) the taking after weights were utilized for the over stocks: 10%, 10%, and 80%. By using the weighted normal strategy, anticipated return for portfolio A was 5.89% essentially, for portfolio B and C the weighted normal returns were 0.58% and 8.25% individually. The primary portfolio which gave L&T the most noteworthy weight created the greatest portfolio return and was utilized as the ideal portfolio to calculate the chance. The over two tables

appear how all three broadened portfolios were influenced severely due the emergency. They created much higher returns in 2016-17 than in 2019-2020

**Table 3**

**Impact of crisis on the chosen portfolio's risk and return**

	Pre-Crisis	Post-Crisis
	Weighted return	Weighted return
HDFC	11.55	0.89756
AIRTEL	1.899	0.56789
LARSEN AND TOUBRO	2.89	2.89745
	14.56	4.5899
Portfolio risk	0.7899	2.897555

**Interpretation:**

The same differentiated portfolio comprising of comparable stocks was utilized for both pre and post emergency examination. As seen the same portfolio created much higher returns in 2019-2020 than in 2020-2021. Too the chance related with the portfolio was higher within the pre-crisis period comparing to the higher return; be that as it may the risk of the portfolio within the post-crisis period was as it were a tad bit lower than the pre-crisis hazard.

The fall in hazard due to lower anticipated return isn't in couple with the degree of drop in anticipated return.

**Table 4**

	Hypothesis t-test	
	2020	2021
Portfolio 1	14.5689	4.289755
Portfolio 2	14.5588	3.56789
Portfolio 3	15.8975	5.256788
p value	0.000005789	

**Interpretation:**

On performing the t-test on the pre and post emergency returns, we gotten a p esteem of 0.000005789. Typically, lesser than the 0.05 level of importance. Subsequently, we dismiss the invalid theory. We in this way prove through our theory testing that there's critical contrast in portfolio return through enhancement in dubious times.

### **Limitations of the Study:**

The test measure (n) utilized for this thing is exceptionally small. It was not conceivable to require a huge number of stocks as the calculation of portfolio change gets to be greatly troublesome and monotonous for the same.

- The information utilized for the examination is simply chronicled in nature. In spite of the fact that the sources of information collection are bona fide, the plausibility of a few controls cannot be ruled out.

### **Outcome of the Study:**

Throughout, we have talked about almost ideal portfolio building through enhancement which would produce the least change and the greatest anticipated return. These points show how expansion, an awfully essential, supportive and broadly acclaimed device of portfolio building, can vacillate to a degree amid dubious financial/ showcase conditions. This report through the examination of three stocks' information pre and post emergency. By testing the portfolio returns, this thought has conclusive proof that

- There may be a noteworthy contrast between the broadened portfolio returns in 2010-2020(pre-crisis period) and in 2021-2022 (post-crisis) returns.
- This weakened impact of broadening might be for an assortment of reasons; the essential being that terrible financial conditions can cause a part of stocks of shifted businesses to vacillate simultaneously.

There are numerous considerations devoted to this predicament and numerous of them propose the different other elective choices that speculators ought to be beyond any doubt whereas contributing amid awful financial times. Amid a financial downturn, speculators ought to play secure and contribute cautiously and intelligently. There should be beyond any doubt:

- Equity gets to be the least secure of all resources amid a crisis.
- Investing in secured stocks and in bonds, etc. which is able to donate a short return.
- Investors ought to contribute to effective choices such as prospects, mutual funds, genuine resources like arrival, etc. instead of staying in the conventional venture stocks.
- An energetic and well broadened resource assignment arranged ought to be made.

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