

# How Can an Individual Construct Optimal Portfolio with Reference to Sharpe's Single Index Model

Rampilla Mahesh<sup>1</sup>

Assistant Professor, Amrita Sai Institute of Science and  
Technology,  
Paritala, Krishna Dt, A.P, India  
Email: rammahesh333@gmail.com

Mekala Tulasinadh<sup>2</sup>

Assistant Professor,  
KBN College PG center, Vijayawada, Krishna  
Dt, A.P, India  
Email: Tulasinad123@gmail.com

**Abstract:** :- Security analysis and selection of portfolios and managing them in the right manner helps in improving the investor's awareness about the trends and changes that exist in the market. Creation of optional portfolio reducing the risk, without sacrificing the returns. The main objectives of the study are to get an insight into the idea in Sharpe's single index model, to determine the return and risk of the optimal portfolio constructed by using Sharpe's single index model. This study is aimed at creating awareness in the minds of investors regarding the utility of Sharpe's Single Index Model in portfolio construction. This papers aims to finding out the how an individual construct optimal portfolio by using to Sharpe's Single Index Model.

**Keywords:** *Optimal Portfolio, Risk & Return, Sharpe model.*

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## 1.1 Introduction

Portfolio management and investment decision as a concept came to be familiar with the conclusion of second world war when thing can be in the stock market can be liberally ruined the fortune of individual, companies ,even government's it was then discovered that the investing in various scripts instead of putting all the money in a single securities yielded weather return with low risk percentage, it goes to the credit of HARYMERKOWITZ, 1991 noble laurelled to have pioneered the concept of combining high yielded securities with these slow but steady yielding securities to achieve optimum correlation coefficient of shares.

## DEFINITION

As per definition of SEBI Portfolio means "a collection of securities owned by an investor it represents the total holdings of securities belonging to any person".

## PORTFOLIO MANAGEMENT:

"The process of managing the assets of a mutual fund, including choosing and monitoring appropriate investments and allocating funds accordingly."

## Scope of the study:

The rational investors never ignore the risk factor while taking investment decisions. The investors prefer to invest in a group of securities which is known as a portfolio in order to diversify the risk. There are different investment avenues for investors to invest. While some investment avenues involve huge risk others may be either less risky or risk less

avenues. Therefore, it is essential to educate the investor about the investment alternatives and the risk and return from those investments. As the scope of investment avenues with varying degrees of risk is vast, the scope of the present study is relating to equity portfolio construction with selected stocks from the NSE.

## Objectives of the Study:

The primary objective of the study is constructing an effective portfolio which offers the maximum return for minimum risk? The following are secondary objectives

- To study the investment decision process.
- To calculate the return of various companies.
- To calculate the risk of various companies.
- To understand, analyze and select the best portfolio.

## METHODOLOGY:

To achieve a fore said objective the following methodology has been adopted. The information for this report has been collected through the Method employed in the investigation depends on the purpose and scope of the study.

## Sources of Information:

Data available in marketing research are either primary or secondary. Primary Data is not included in this study, only secondary data is taken in to account since, it is a comparative analysis.

## Secondary Data:

Secondary data can be defined as - “data collected by someone else for purpose other than solving the problem being investigated”. Secondary data is collected from external sources which include information from published material of SEBI and some of the information is collected online. The data sources also include various books, magazines, newspapers, websites etc. While in this study companies chosen randomly and 5 years data taken from 2011-2015

#### Formulae

$$\text{Average} = \Sigma X/n$$

$$\text{Standard deviation} = \sqrt{\text{variance}}$$

$$\text{SD in \%} = \text{Average Of The Excess Return /Standard Deviation}$$

## 1.2. REVIEW OF LITERATURE

Varadharajan and Ganesh (2012) applied the SIM on equity portfolio of large caps companies of selected sectors in India. The main aim of this study is to find out the optimum portfolio from the selected companies in three major sectors like power sector, shipping sector and textile sector. From each sector six companies have been selected and so a total of eighteen companies are selected as samples. The companies with the largest market capitalization in each sector have been selected. Data for five financial years were used for constructing the portfolio; i.e. from 1st April 2006 to 31st march 2011. All calculations have been done using MS Excel. From the analysis it was found that only five companies were included in the portfolio constructed out of the eighteen companies.

Tripathy, Sasikanta (2011) applied the model on selected Indian banks' scrips. The author assumed that there is a positive relationship between the banked and individual stocks. Fifteen securities selected of the banks comprised in BANKEX as a sample. The data is based on secondary source for the period from 1st April 2011 to 31st march 2012. It was found that there is a linear relationship between security returns and the common factor that there is no difference among the return of all the banks from the ANOVA.

Sarker, Mokta Rani (2013) conducted a study to construct an optimal portfolio using Sharpe's Single Index Model considering no short sales. The study has been conducted on individual securities listed in Dhaka Stock Exchange, where short sales are not allowed. The monthly closing prices of one hundred and sixty four companies listed in Dhaka Stock Exchange and share price index for the period of July 2007 to June 2012 have been considered in this study. This

method formulates a unique cut-off point, selects stocks having excess return to beta ratio surpassing this cut-off point and determines the percentage of investment to be made in each of selected stocks. The optimum portfolio consists of thirty three stocks selected out of one hundred and sixty four stocks giving the return of 6.17%. From this empirical analysis to some extent, an investor can forecast individual securities return through the market movement and can make use of it.

Gopalakrishna, Muthu (2014) explains the investment alternatives available for rational investor. A comparison of traditional portfolio theory with that of modern portfolio theory is made in this study. This study aims to test whether single index model offers an appropriate explanation of stock returns on IT stocks. The samples included in this study consists of 13 actively traded scrips listed in the National Stock Exchange Limited, Bombay (NSE). The scrips in the sample are selected from NSE IT index. The secondary data for a period 2004-2008 has been used for the study. By applying regression on the market return and excess security return it is found that IT index has a phenomenal amount of sensitiveness over S&P CNX Nifty. The study investigated that there are four aggressive stocks having beta coefficient of more than one. It is recommended that among the sample companies all the stocks are undervalued except one stock and thus the investors can pick these stocks to revise their portfolio.

## SHARPE'S SINGLE INDEX MODEL

Markowitz Model had serious practical limitations due the rigors involved in compiling the expected returns, standard deviation, variance, covariance of each security to every other security in the portfolio. Sharpe Model has simplified this process by relating the return in a security to a single Market index Single Index Model

The single index model is based on the assumption that stocks vary together because of the common movement in the stock market and there are no effects beyond the market that account the stocks co- movement.

Portfolio management refers to the management of portfolio's for others by professional investment managers it refers to the management of an individual investor's portfolio by professionally qualified person ranging from merchant banker to specified portfolio company.

## 1.3 Results and discussion

### Table: 1

Statistical results of yearly return, average return, standard deviation and Sharpe ratio of FMCG sector

Year	DABUR	BRITANNIA	HUL	ITC
2015	18%	61%	14%	-12%
2014	37%	100%	33%	15%
2013	32%	84%	9%	12%
2012	29%	11%	29%	42%
2011	0%	9%	31%	15%
Average return	18%	48%	18%	9%
Standard deviation	0.133887	0.371224	0.097824	0.17352
Sharpe ratio	1.365655	1.298687	1.834814	0.544594

### Interpretation:

From the above information we can understand the company's performance and the return & risk as well. Here FMCG sector taken for investment so, accordingly found few statistical results like yearly return, average return, Standard deviation and Sharpe ratio. All of these are providing necessary information to an investor, i.e., HUL is best among all and least is ITC.

**Table: 2**

Statistical results of yearly return, average return, standard deviation and Sharpe ratio of BANKING sector

Year	HDFC	SBI	AXIS	ICICI
2015	13%	-28%	-10%	-26%
2014	43%	-82%	-61%	-68%
2013	-2%	-26%	-4%	-3%
2012	59%	47%	68%	66%
2011	-82%	-42%	-40%	-40%
Average return	1%	-31%	-15%	-19%
Standard deviation	0.489705	0.419593	0.440268	0.453026
Sharpe ratio	0.024688	-0.74602	-0.33209	-0.42505

### Interpretation:

From the above information we can understand the company's performance and the return & risk as well. Here BANKING sector taken for investment so, accordingly found few statistical results like yearly return, average return, Standard deviation and Sharpe ratio. All of these are providing necessary information to an investor, i.e., HDFC is best among all and least is SBI.

**Table: 3**

Statistical results of yearly return, average return, standard deviation and Sharpe ratio of AUTO MOBILE sector

Year	TVS	HERO	BAJAJ	Motherson sumi
2015	8%	-13%	4%	-36%
2014	253%	50%	28%	150%
2013	82%	9%	-10%	-8%
2012	-19%	0%	34%	46%
2011	-27%	-4%	3%	-26%
Average return	54.38%	3%	7%	20%
Standard deviation	1.04239433	0.219117	0.164844	0.684646
Sharpe ratio	0.52171239	0.14702	0.404035	0.299019

### Interpretation:

From the above information we can understand the company's performance and the return & risk as well. Here AUTOMOBILE sector taken for investment so, accordingly found few statistical results like yearly return, average return, Standard deviation and Sharpe ratio. All of these are providing necessary information to an investor, i.e., TVS is best among all and least is HERO.

**Table: 4**

Providing ranks based on the Sharpe ratio

Company name	Average return	Standard deviation	Sharpe ratio	Rank
HUL	18	0.09782	1.83481	1
Dabur	18	0.13389	1.36566	2
Britannia	48	0.37122	1.29869	3
ITC	9	0.17352	0.54459	4
Tvs	54	1.04239	0.52171	5
Bajaj	7	0.16484	0.40404	6
Motherson	20	0.68465	0.29902	7
Hero	3	0.21912	0.14702	8
Hdfc	1	0.48971	0.02469	9
Axis	-15	0.44027	-0.3321	10
Icici	-19	0.45303	-0.4251	11
Sbi	-31	0.41959	-0.746	12

### Interpretation

The above analysis is clearly explaining about company's return and risk. Based on the return, standard deviation and Sharpe ratio ranks have been given, it means preference given to your investment while investing your money. This is providing information to construct an optimal portfolio; you can choose any six out of 12 to maximize return with minimizing risk.

### CONCLUSION

From the above it is concluded that Portfolio is a combination of various securities. . The main objective of portfolio management is to help the investor in investing in various securities so, that risk is to be minimized and to get higher yield of return. In this research sharpe model has used off course Markowitz model is there but it has some practical problems. as a result, sharpe model used to construct optimal portfolio and it is very easy to calculate average return, Standard deviation and Sharpe ratio and select best combination.

#### References:

- [1] Berry G.C, (2000), "Marketing Research", 3rd Ed, Tata Mc Grew-hill co. ltd, New Delhi.
- [2] G. Jayabal ; New Age International (p) Limited , Publishers. 2011 Edition
- [3] Investment Analysis And Portfolio Management By Frank K.Reilly , Keith C Brown ; South Western College Publication . 7th Edition
- [4] Security Analysis And Portfolio Management By K. Nagaranjan Advanced Financial Management: Kohok, M. A. Everest ISI Journal Citation Reports © Ranking: 2012: 1/86 (Business Finance); 3/332 (Economics) Online ISSN: 1540-6261
- [5] Security Analysis And Portfolio Management By Punithavathy Pandian ; Vikas Publishing house Pvt Ltd. 2011 edition

#### Websites:

- [6] [www.portfoliomangement.com](http://www.portfoliomangement.com)
- [7] [www.investopedia.com](http://www.investopedia.com)
- [8] [www.nseindia.com](http://www.nseindia.com)