Constructing an Optimal Portfolio Based on Market Capitalisation in National Stock Exchange, India

P.Revathi
Assistant Professor Department of Management Studies, KIT - Kalaignarkarunanidhi Institute of Technology, Coimbatore, Tamil Nadu, India

Abstract

Risk according to Webster is "a possibility of loss". Risk arise from uncertainty to foresee the future, Investors in general would like to analyze the risk factors and a thorough knowledge of the risk helps him to plan his portfolio in such a manner so as to minimize the risk associated with the investment. The secondary market enables investors to continuously rearrange their asstes. Portfoloio are a combination of securities such as stocks, bonds and market instruments. The process of blending together the broad asset classes so as to obtain optimum return with minimum risk is called portfolio construction. This paper focuses on portfolio construction by which an optimal portfolio is constructed using scripts listed in BSE – SENSEX. Applying Sharpe's Single Index Model and taking BSE – SENSEX as market index and considering monthly indices for the period of April 2007 – March 2012, the proposed method formulates a unique cut off point (cut off rate of return) and selects stocks having excess of their expected return over risk-free rate of return surpassing this cut-off point.
KEYWORDS: Beta, Sensex, Optimal Portfolio, Stock Market, Sharpe's Single Index Model.

INTRODUCTION

Portfolio includes investment in different types of marketable securities or investment papers like shares, debentures stock and bonds etc., from different companies or institution held by individuals firms or corporate units and portfolio management refers to managing securities. Many tools are available on the market today to assist investors with fundamental and technical analysis of their equity investment. The stock market is characterized by the trade-off between risk and return. The relation between risk and return that usually holds, in which one must be willing to accept greater risk if one wants to pursue greater returns also called risk/reward trade-off. The higher the risk the investor is willing and able to take, the higher the potential rewards from the investment. Therefore, if a particular investment offers you high returns, it is an indication that it will come with a high risk burden.

OPTIMAL PORTFOLIO CONSTRUCTION

Portfolio is a combination of securities such as stocks, bonds and money market instruments. The process of blending together the broad asset classes so as to obtain optimum return with minimum risk is called portfolio construction. Diversification of investments helps to spread risk over many assets. A diversification of securities gives the assurance of obtaining the anticipated return on portfolio. In a diversified portfolio, some securities may not perform as expected, but others may exceed the expectation and making the actual return of the reasonably close to the anticipated one.

VARIOUS METHOD OF CONSTRUCTING OPTIMAL PORTFOLIO

Some of the famous methods for constructing optimal portfolio are'
- ➢ Markowitz model
- ➢ Sharpe's single index model

TOOLS & TECHNIQUES:

The following statistical techniques were used for measuring the performance of the company's funds.
Single Index Model

$$Ri = \alpha i + \beta i Rm + ei$$

Sharpe's Optimal Portfolio

Sharpe had provided a model for the selection of appropriate securities in a portfolio. The selection of any stock is directly related to its excess return to beta ratio (Ri-Rf).

ANALYSIS & INTERPRETATION
DETERMINATION OF CUT OFF POINT(C*) - OPTIMAL PORTFOLIO

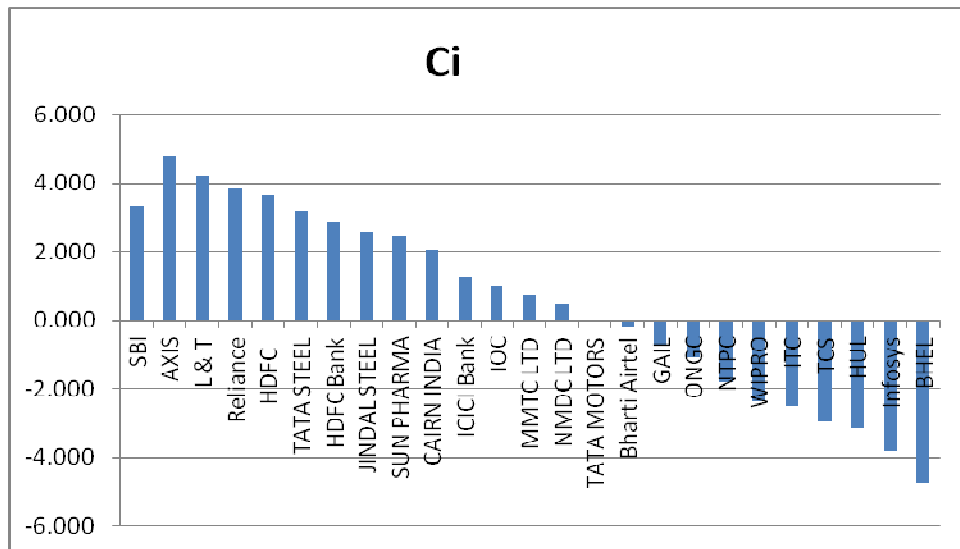C Values For each company is calculated using the following formula

$$Ci = \frac{\sigma m2 \sum (Ri-Rf) \beta I / \sigma ei2}{1 + \sigma m2 \sum \beta i2 / \sigma ei2}$$

Table 1: Cut-off Rate

Company name	Ci	Company name	Ci
SBI	3.327	MMTC LTD	0.749
AXIS	4.795	NMDC LTD	0.487
L & T	4.210	TATA MOTORS	-0.001
RIL	3.868	BHARTI ARTL	-0.216
HDFC	3.661	GAIL	-0.731
TATA STEEL	3.151	ONGC	-1.099
HDFCBANK	2.881	NTPC	-1.783
JINDAL TEEL	2.585	WIPRO	-2.357
SUN PHARMA	2.466	ITC	-2.491
CAIRN INDIA	2.046	TCS	-2.972
ICICIBANK	1.271	HUL	-3.139
IOC	1.013	INFY	-3.796
		BHEL	-4.744

Chart 1: Cut – off points of the scripts

The Ci values is go on increasing up to a certain point and then starts decreasing in the table shown above. The highest point (4.210) is called cut off point (C*). The securities which are above C* point are chosen to construct the optimal portfolio.

Table 2: Cut – off point of companies selected for optimal portfolio

SL.NO	COMPANY NAME	CUT-OFF POINT
1	SBI	3.327
2	AXIS	4.795

The Cut – Off point position limit of selected companies are shown in the above table. There are two company shares selected for constructing the optimal portfolio.

Table 3: Risk and Return Analysis of Portfolio

Security Name	Mean Return	SD	Beta	Portfolio Return	Portfolio SD
SBI	1.941	13.46	1.231	2.24	13.3
AXIS	2.566	14.66	1.363		

FINDINGS AND SUGGESTIONS

❖ SBI and AXIS are selected for constructing the optimal portfolio. The Ci value is increasing from SBI 3.327 to AXIS 4.795 and then starts decreasing. The highest point is called cut off point (C*). The securities which are above C* point are chosen for constructing optimal portfolio.

❖ The companies are ranked based on the decreasing value of the excess return to beta ratio.

❖ The investment proportion states that the SBI share holds more than that of AXIS share.

❖ The scripts chosen for constructing the optimal belongs to banking sector and it states that comparing various shares of different sectors, banking scripts gives the investors a moderate return with minimum risk.

CONCLUSION

Based on the constructed portfolio we can conclude that the SBI and AXIS shares have performed well when compared to other shares. Though share trading are quite fluctuating day-by-day, the performance of shares depends on the volatility of the market. It is being assumed that casual observation of the stock prices over the period of time reveals that most of the stock prices move the market index. When the Sensex

increases, stock prices also tend to increase vice-verse. This indicates that some underlying factors affect the market index as well as the stock prices. Stock prices are related to the market index and this relationship could be used to estimate the return on stock. Keeping all these assumption in mind this portfolio has been constructed giving due consideration to the past five year performance of all the Sensex companies.

REFERENCES

1. Desai, R. &Surti, M.(2013), 'Optimal Portfolio Construction: Sharpe's Single Index Model', International Journal of Scientific Research, 2 (9), pp: 250-251.
2. Donald E Fisher, Ronald J. Jordan, sixth edition, Securities Analysis and Portfolio Management, PHI, India.
3. Gopalakrishna, M.(2014), 'Optimal Portfolio Selection using Sharpe's Single Index Model', Indian Journal of Applied Research, 4(1), pp: 286-288.
4. Giri L. K. &Parhi G.(2017), 'Optimal portfolio construction using single index model', Intercontinental Journal of finance research review,5(2), February.
5. Haugen, R.(2001), Modern Investment Theory, 5th Edition, Upper Saddle River, New Jersey: Prentice- Hall, Inc.
6. Kamal, J.B.(2012), 'Optimal Portfolio Selection in Ex Ante Stock Price Bubble and Furthermore Bubble Burst Scenario from Dhaka Stock Exchange with Relevance to Sharpe's Single Index Model', Financial Assets and Investing, 3(3), pp. 29-42
7. V K Bhalla ,Investment management (2008), 5th edition, SChand Publications, India.

Websites:

1. www.nseindia.com
2. www.bseindia.com
3. www.sebi.gov.in
4. http://www.rbi.org.in/
5. www.answers.com