Optimum Portfolio Construction of Mutual Funds

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Abstract
Indian securities market is a highly volatile and sensitive market where portfolio construction is highly important to get good returns. Risk and recovery relationships are an important part of investing in decision-making. Although studies have examined the risks and relationships of relapses, the investor remains willing to invest in a high-yield and low-risk financial institution; and it is very necessary to create a portfolio that meets the goals and objectives of investors. The investor is trying to make a high profit with minimal risk. The main focus of this research is to construct an optimal portfolio with the help of CAPM. In this research, banks and companies has been taken into consideration for constructing the optimum portfolio. Eight banks and companies like HDFC Bank, ICICI Bank, Infosys, L&T, Reliance Insurance, Bharthi Airtel, NTPC and Housing Development Finance Corporation Ltd been selected and excess to beta ratio has been calculated and ranked the companies based on that ratio. The cut-off point was calculated based on the highest value and cut-off point should be used to calculate the proportion of money to be invested in each stocks. This research findings and suggestions would be helpful to investors for investing in banks and companies.
Keywords: Mutual Funds, Volatility, Risk, Cut off Point and investment decision

I. Introduction

The mutual fund is the trust that collects a savings of several investors who share their common financial interest. The money will invested in instruments of capital market such as stocks, bonds & other securities. An appreciation of realized capital & returns received from these investments are shared in proportion to the number of units they own by their unit holders. So, the mutual fund is an ideal investment for all general public as a mutual fund offers the opportunity for investing in a different &professionally maintained security from relatively low cost. In India a mutual fund industry was opened in year 1963, & India Trust unit was developed under the guidance of the Indian Government & the Indian Reserve Bank. Shared financial context will be divided into six specific stages in Indian Mutual Fund industry. The trust was taken up after a shared reservation on the need structure, "giving the company an advantageous position that is indistinguishable from that of large entrepreneurs by spreading it across various industries for direct media hoops". The idea of offering the venture capability of money related markets to all people generated extra "speculation organizations" in Britain & Scotland & in addition to 2 other things helped fund the advancement of the post-common was US economy. The greater part of early British speculation organizations or trust took after the present shut end supports by issuing a settled number of offers to gatherings of financial specialists whose "pooled" resources were put resources into different organizations. Numerous different trusts took after that objective interest in America, as well as more imperatively prompted the presentation of speculation support idea of United State partakes in the year 1800s &1900s.

II.   Background of the Study

Mutual Funds is a special purpose vehicle, constructed with different proportions of financial assets/securities bearing different return and risk exposure to diversify the overall investment risk among all the units equally. Mutual funds can be focused on a particular asset like stocks of various companies from various industries or may be a composition of stocks, debentures, gilt-edged securities like treasury bills or government bonds, commodities or even precious metals like gold, platinum and even including real estate.

III.   Review of Literature

Y Maheswari (2020) studied the basis for the performance evaluation of the mutual fund in future. The research has focused on investigator in understanding the different categories of mutual fund, the nature of the market, and the best performing mutual fund from selected pool of mutual fund. Dr. Dhandayuthapany & M K Sindhu (June2018) The overall performance of the selected projects was described based on the Sharp, Treynor and Jensen measurement, which would be knowledgeable for investors to make best decisions for investment. Mr. NavjyotRaval (May2018) the purpose of the study is to examine & compare the performance of the diverse equity mutual fund schemes of selected companies. Overall, all selected mutual fund companies operate positively. ICICI Mutual Fund has performed well. Equity A Direct (G) Mutual Fund and DWS Top Euro land Off shore Fund (G) have lower levels o frisk compared to Franklin and DSP. Dr.S P Dhandayuthapani , S Arunpratheep (March2018) The study mainly focuses on open projects and the income they contain. According to the analysis, HDFC Liquid Funds and HDFC Cash Management Fund are performed well. Dr. R Siva Rama Prasad, H Kanaka Durga (December2017) all selected equity Mutual fund schemes are efficient expect for one scheme i.e. Sundaram Select mid Cap Reg. Mamta & Satish Chandra Ojha (November2017) The examination show that mainly of the funds selected for the research performed well with respect to the Sharpe Ratio & the Trener Ratio. Geeta Rani, Dr.Vijay Singh Hooda (October2017) this is the performance evaluation of selected topper projects. According to this research, mutual funds are one of the mainly efficient tools for little and medium-sized investors to invest and offer the chance to participate in the low-risk capital market. Khurshid Ahmed Butt (2017) the researcher concluded his study by stating that the portfolios gave higher returns when compared to the market index and also the standard deviation i.e portfolio risk is much lesser than that of the market risk. Vikas Kumar and Ankit Srivastava (2016), the analysis results stated that among all the mutual fund schemes, Reliance Pharma Fund stood out to be the best. P Sathish, K Sakthi Srinivasan (May2016) investors face major problems in choosing a mutual fund in provisions of risk and returns. Therefore, this research can help investor's select asset management companies in terms of fund performance.

Dr.SmitaShukla,RakeshMalusare(May2016) Indian mutual funds should use the opportunity to invest fully and effectively in foreign in strumpets for the benefit of investors. NBhagyasree, Mrs.BKishori(April2016) Reliance Regular Savings Fund Equity, SBI Contra Fund and HDFC Equity Fund projects did not achieve the diversification problem. Kantesha Sanningammanavara, Girish K and Manjunath S (February 2016) proved that there is a difference in income between the selected mutual funds. Arathy B, Aswathy A Nair (2015) equity based schemes are the most preferred better past experience investment decisions. M.M.Goyal (2015), among all the 10 funds, Frankline Opportunities Fund was the high performer with optimal characteristic. Dr. JK Raju (2015) concluded that the risk perception of every investor was similar and most of them preferred Tax-saving fund. S.Vasantha(2013) concluded her study by stating that most of the funds gave negative returns over the year and rest didn't prove to be performing extraordinarily.

Dr.R.Narayanasamy, V.Rathanamani, (2013), the schemes belonging to large cap category have performed really well in the volatile market and showing exhibiting the defensive strategy against the external risk. Bhaskar Biswas(2013), the diversified equity funds have been mainly invested in very few sectors and not fully diversified. Dr. Vinay Kandpal & Prof. P C Kavidayal(2013), public sector funds didn't perform well, when compared to counter parts i.e the private sector funds due to poor allocation of funds and inefficient management by the portfolio manager. S. Poornima(2013), through the Sortino Ratio. Eventually, she stated that out of 102 funds, only an aggregate of 97 funds were able to materialize the expected returns Rajesh Kumar, Riturajchandrakar(2012), The researchers have analyzed the open-endedgrowth oriented equity schemes of various fund houses, Nearly, 48% of the chosen funds have shown higher returns than the index returns as chosen for benchmark.

Rizwan Ali (2011) worldwide had been a tremendous growth in industry in both the size and maturity of many foreign capital markets. Lakshmi N (2007), the overall funds mobilized by the industry had surged by 57% and AUM (Asset under Management) by 14% from 1997 to 2006. Ms. M. V Subha and Ms. Jaya Bharathi (2007), the time frame of research was done from 1st October 2004 to 30th September 2005. The analysis concluded that the performance of open ended Mutual Funds during that period of study was satisfactory and fruitful for the investors. Dr. S. Narayanrao, (2003), as opposed earlier, the study concluded that even investors are able to materialize their expectations in "Bear Market". Arnold L. Redman (2000), the anticipated returns were computed by using Sharpe's ratio, Treynor's ratio and Jensen's differential equation. Prof. Gauri Prabhu(2000), most of the investors are investing to get regular fixed returns, for which they have opted the Monthly-income scheme through SIP (Systematic Investment Plan). Panigrahi, M.S.(1996), to attract and benefit the investors, the firms need to focus on index linked funds, sectoral funds and money market securities fund Michael C. Jensen (1967), the managers managing these funds were not able to predict the securities movement.

IV.   Statement of Problem

Review of literature suggests that large amount of studies have been carried out to evaluate the performance of mutual funds on the basis of either NAV (Net Asset Value) or SD (Standard Deviation) as indicators (Khurshid Ahmed Butt, Rajesh Kumar, Rituraj chandrakar) etc. However, most of these studies have been mainly emphasizing and undertaken to identify whether the mutual fund units are undervalued or overvalued by comparing it with the similar funds from same industries. In reality, this doesn't make any sense, as NAV is just the value or price of a unit of mutual fund, which is the fraction of Net assets of the mutual fund company and the total number of mutual fund units outstanding and doesn't contribute anything towards the performance of such fund. If a Mutual fund unit has higher NAV, then less number of units can be bought and vice-versa.

Whereas none of the research has made a study on the construction of portfolio of hybrid mutual fund and allocation of fund on equity and debt in hybrid mutual fund, that might be a constrain for the research such as Time constrain, Quality constrain, Cost constrain and so on.

V.   Objectives of the study

- To analyze the proportion of investment in various asset class.
- To Evaluate of portfolio performance

VI.   Research Methodology

6.1 Type of research

The research is descriptive & analytical research in nature, in this research the portfolio is calculated for the improvement of return to the investor. It helps to describe the market notion based on the behavior of investors.

6.2 Data collection method

In *Primary Data -* Primary data is the data collected for the first time through personal experiences or evidence, particularly for research. It is also described as raw data or first- hand information. The mode of assembling information is costly, as the analysis is done by an agency or an external organization and need human resources and investment. The investigator supervises and controls the data collection process directly. Mostly the data is collected through observations, physical testing, personal interaction with office employees etc. In the following research, the primary data is collected through discussion with financial analyst and HR manager of ABSL AMC.

Secondary Data - Secondary data are second-hand data that is already collected and recorded by some researcher for their purpose and not for the current research problem. It is accessible in the form of data collected from different sources such as government publications, censuses, internal records of the organization, books, journal articles, websites, and reports etc. This method of gathering data is affordable,

readily available, saves cost and time. However, the one disadvantage is that the information assembled is for some other purpose and may not meet the present research purpose or may not be accurate. In the following research, most of the data have been gathered from secondary sources such as from Aditya Birla official website, company brochure, books and annual report.

6.3 Tool and Techniques of the study

Statistical Tool: Descriptive and T- Test

Descriptive Test include:

Mean: It is the average level observed in some price of data, while standard deviation describes the variance, or how dispersed the data observed in that variable in distributed around its mean.

Standard Deviation: It is measure of dispersion of a set of data from its mean. It measures the absolute variability of a distribution, the higher the dispersion or variability, the greater is the standard deviation and greater will be the magnitude of the deviation of the value from their mean.

Covariance: It is a measure of how changes in one variable are associated with changes in a second variable. Specifically, covariance are linearly associated. However, it is also often used informally as a general measure of how monotonically related two variables are There are many useful intuitive explanations of covariance here.

6.4 Financial tools.

- Sharpe Ratio: It indicates that risk return performance of portfolio.

$$\text{Sharpe Index} = \frac{\text{Portfolio Average Return (Rp)} - \text{Risk free Rate of Return (Rf)}}{\text{Standard Deviations of the Portfolio Return}}$$

- Treynor Ratio: It measure the returns earned in excess of that which could have been earned on investment that has no diversifiable risk:

$$\text{Treynor Index} = \frac{\text{Portfolio Average Return (Rp)} - \text{Risk free Rate of Return (Rf)}}{\text{Beta Coefficient of Portfolio}}$$

- Jensen ratio: It means the risk-adjusted performance of a security or portfolio in relation to the expensed market return:

Alpha (α) = (Rx – Rf) – β (Rm – Rf)

- Standard Deviation: It shows the historical volatility.

6.5 Sample technique & Sample Size

Based on the population and the data the study have figure out the 8 stocks under convenient sampling technique which reported percentage to net assets on portfolio holdings at 4.18% and these companies are identified and chosen for construction of optimum portfolio.

Table No. 1.1   Selected Companies for calculation of CAPM

Issure	% TO NET ASSET
HDFC Bank Limited	9.53%
ICICI Bank Limited	8.24%
INFOSYS LIMITED	6.18%
LARSEN & TOUBRO LIMITED	5.07%
RELIANCE INSUEANCE LIMITED	4.94%
BHARTI AIRTEL LIMITED	4.29%
NTPC LIMITD	4.21%
HDFC	4.18%

VII. Data Analysis and Interpretation

The study mainly focuses on constructing an optimum portfolio by considering a study period of 2 years from 1-1-2019 to 31-12-2021 using both financial tools and statistical tools. The study uses secondary source of data and collecting information of 8 selected listed companies. The research will help to the investors to realize the better returns for their investment. The following tables are representing the calculations of risk, returns and optimum portfolio construction.

Optimum Portfolio Construction

Table No. 1.2   Ranking of Stock based on Excess Return of Beta Ratio

Companies	Beta	Return	Risk Free	Ri - Rf/β	Rank
HDFC Banks	0.418	9.698	7.15	-7.4073	7
ICICI Bank	1.418	0.4515	7.15	-4.5908	4
Infosys	1.4018	0.493	7.15	-4.6076	5
Larsen & Toubro	-0.744	-0.2631	7.15	9.34712	3
Reliance Insurance Ltd	-0.0555	0.599	7.15	129.428	1
Bharti Airtel Ltd	0.681	0.622	7.15	-9.8773	8
NTPC Ltd	-0.331	-0.1164	7.15	21.4848	2
HDFC Ltd	1.0237	0.2532	7.15	-6.7313	6

It can be seen in the Table: 2 that Reliance Insurance Ltd show the maximum return (129.428) out of 08 companies and Bharti Airtel Ltd shows lowest return of -9.8773. The returns on stock investment are positive for three companies and negative for five companies. It can be seen from the above table that with except of ICICI Bank (beta of 1.418), the other beta value is lessor. L & T has a lowest beta with value 0.744.

Table No. 1.3 Calculation of Under Price and Over Price by using CAPM Formula

Companies	Beta	Return	Risk Free	CAPM	UP/OP
HDFC Banks	0.418	9.698	7.15	14.611	Over Valued
ICICI Bank	1.418	0.4515	7.15	32.46	Over Valued
Infosys	1.4018	0.493	7.15	32.17	Over Valued
Larsen & Toubro	-0.744	-0.2631	7.15	-6.13	Under Valued
Reliance Insurance Ltd	-0.0555	0.599	7.15	2.76	Over Valued
Bharti Airtel Ltd	0.681	0.622	7.15	19.3058	Over Valued
NTPC Ltd	-0.331	-0.1164	7.15	1.24	Over Valued
HDFC Ltd	1.0237	0.2532	7.15	25.423	Over Valued

In above table: 3 CAPM has calculated for 8 selected companies out of which 1 companies are Under-priced and 07 companies are Over-priced.

Table No. 1.4   Calculation on the basis of rank and unsystematic risk

Companies	sd2 /ei	(Ri-Rf)β/sd2ei	∑(Ri-Rf) β/sd2ei
Reliance Insurance Ltd	0.1079	4.276710843	4.277
NTPC Ltd	0.0873	26.9929929	31.2699929
Larsen & Toubro	0.131	40.34453359	71.61452649
ICICI Bank	0.1175	-85.83530851	-14.22078202
Infosys	0.11	-90.624	-104.844782
HDFC Ltd	0.2328	-31.1877579	-136.0325399
HDFC Banks	0.4154	2.503247954	-133.529292
Bharti Airtel Ltd	0.0994	-48.36341247	-181.8927044

Table No. 1.5 Calculation of Cut-off-point

Companies	$\beta2/sd2$ ei	$\sum\beta2/sd2$ ei	C*
Reliance Insurance Ltd	0.028547	0.02855	0.015513
NTPC Ltd	1.254994	1.28354427	0.149958
Larsen & Toubro	4.225466	5.50900992	0.430796
ICICI Bank	17.11254	22.6215546	0.720782
Infosys	17.86403	40.4855841	1.020038
HDFC Ltd	4.501554	44.9871377	1.067052
HDFC Banks	0.420616	45.407754	1.089864
Bharti Airtel Ltd	4.665604	50.0733576	1.084059

The selection of the stock depends on a cut-off rate such that all stocks with higher ratio of excess return to beta are included and stock with lower ratio are left out. The highest value of Ci is taken as the cut-off point that is C*. From Table: 5 seen that HDFC bank as the highest cut-off rate of 14.07. All the stocks having Ci greater than C* can be included in the portfolio.

Table No.1.6 Calculation of Proportion

Companies	sd2 ei	C*	Zi	Proportion
Reliance Insurance Ltd	0.1079	0.015513	3.679298	0.053
NTPC Ltd	0.0873	0.149958	26.81335	0.385
Larsen & Toubro	0.131	0.430796	39.06512	0.562
			69.56	1

After analyzing the securities to be included the optimal portfolio, the study has to find the proportion of investment in each of these stocks. It can be observed from table 6 only three stocks qualify to be included in the optimal portfolio on this criterion. These are Reliance Insurance Ltd, NTCP Ltd and Larsen and Toubro with cut-off point (ci) of 0.015513,0.149958 and 0.430796 respectively as displayed in table.

VIII. Results and Discussion:

- The HDFC Bank has the highest return of 9.698 and the L & T has the lowest return -0.2631 if the investor wants to earn a maximum return without considering the risk aspect then investment can be made on those securities which yield high return. Even though the return is high, the risk involve in the stock return should be considered while taking investment decisions.
- The return from ICICI bank security has the highest beta value of 1.418 which means that it is highly volatile and L&T has the lowest -0.744.
- The HDFC bank stock return has the highest unsystematic risk of 0.4154 and that of the NTPC as the least risk of 0.0873 it is the unique risk affecting the firm due to certain factors affecting only the company issuing such security.
- The three securities ranking from 1to3 based on the CI values where identified along with the proportion of investment to be made. The proportion of the investment to be made is 38.5% in, NTPC stock. In L&T stock 56.2% and Reliance stock 5.3%. This implies that the majority of funds may be invested on the L&T stock.
- CAPM has resulted among 8 companies 01 company is Under-priced and 07 companies are Over-priced.
- With the combination of Optimum Portfolio Construction and CAPM, HDFC Bank, ICICI Bank, Infosys, Reliance Insurance Ltd, Bharati Airtel Ltd and NTPC Ltd are Overprice feasible to make an investment to aggressive investors.
- Return of individual securities resulted more than the significant value i.e., there is insignificant changes in the returns of selected securities and also selected sector
- There is a significant impact between risk and return of selected securities.
- Aditya Birla sun life mutual fund shouldn't take the risk of investing a huge fund above 20% of total in only financial services and Banking industry; from the above it is found that most funds are invested in Banking and Financial services sector alone. Because, financial institutions main aim is to generate income from granting loans and advances to different kinds of borrowers on the basis of their credit worthiness. If the

borrowers fail to discharge their due liability of repaying the loan then the loss has to be borne by the lending institutions. This is even safer with the secured loan but in case of unsecured loans, which is not backed up by any collateral is too risky. Therefore, I recommend them to diversify their fund in such a way that the market risk is shared equally among the industries in a judicious manner.

IX.   Conclusion

Construction an optimal portfolio is a challenging task for the individual as well as the institutional investors. The study made an attempt to construct an optimum portfolio using the CAPM model. Among the Eight selected sample companies, only three were selected for Constructing Optimal Portfolio. The final decision of Optimum Portfolio investment should be made only after considering all the factors affecting the selected securities. These can be generally economic factor or any other micro economic factors which govern the movement and action of the movement of these securities in the market. There is a future scope of research of this kind need to be conducted considering different types of sample. The results of the present study and such micro level studies have more significant value to the fund managers of emerging economics like India. The capital markets are still in their developing stages and many foreign institutional investors are also invested in the leading stock exchange of these countries.

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