Analysis of Portfolio Risk and Return with reference to Securities Market- A Study

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Abstract:

A Portfolio is a collection of investments held by an institution or a private individual. In building up an investment portfolio a financial institution will typically conduct its own investment analysis, whilst a private individual may make use of the services of a financial advisor or a financial institution which offers portfolio management services. Holding a portfolio is part of an investment and risk-limiting strategy called diversification. By owning several assets, certain types of risk (in particular specific risk) can be reduced. The assets in the portfolio could include stocks, bonds, options, warrants, gold certificates, real estate, futures contracts, production facilities, or any other item that is expected to retain its value.The process of investment management begins with an evaluation of the available investment opportunities. The investor must have a clear picture of the current investment. He should be able to design a framework for evaluation of risk return profile of various securities. This paper discusses the evaluation techniques of risk and return of selected portfolio.

Key Words: Assets, Correlation,Portfolio Return, Portfolio Risk, Securities.

INTRODUCTION

Portfolio analysis includes analyzing the range of possible portfolios that can be constituted from a given set of securities. A combination of securities with different risk- return characteristics will constitute the portfolio of the investor. A portfolio is a combination of various assets and/or instruments of investments. The portfolio is also built up out of the wealth or income of the investor over a period of time with a view to suit his risk and return preferences to that of the portfolio that he holds. The portfolio analysis is an analysis of the risk-return characteristics of individual securities in the portfolio and changes that may take place in combination with other securities due to interactions among themselves and impact of each one of them on others.

NEED FOR THE STUDY

Individuals act and react based on their perception, not on the basis of objectives of reality. Thus, individual perceptions are much important to the marketer than the knowledge of objective reality. Perception is defined as the process by which an individual selects, organizes and interprets stimuli into a meaningful and coherent picture of the world. A stimulus is any unit of input to any of the sense. Identification of assets or securities, allocation of funds and also identifying the classes of assets are also be done for the purpose of investment.They have to decide the major weights, proportion of different assets in the portfolio by taking into consideration the related risk factors. Return and minimize risk in the investment even if there are unlimited risks in the market. Keep the security, safety of principle sum intact both in terms of money as well as its purchasing power. Stability of the flow of income is more accurate and systematic to reinvestment or consumption of income.

SCOPE OF THE STUDY

The study covers the calculation of correlations between the different securities in order to find out at what percentage funds should be invested among the companies in the portfolio. Also the study includes the

calculation of individual Standard Deviation of securities and ends at the calculation of weights of individual securities involved in the portfolio. These percentages help in allocating the funds available for investment based on risky portfolios.

OBJECTIVES OF THE STUDY

1. To analyze the investment pattern, which gave optimal return at a minimize risk to the investor for the selected securities.
2. To analyze whether the portfolio risk is less than individual risk and also to understand the constituents of portfolio.
3. To understand portfolio selection process and select the best portfolio.

RESEARCH METHODOLOGY

Research design or research methodology is the procedure of collecting, analyzing and interpreting the data to diagnose the problem and react to the opportunity in such a way where the costs can be minimized and the desired level of accuracy can be achieved to arrive at a particular conclusion.

The methodology used in the study for the completion of the project and the fulfillment of the project objectives, is as follows:

） Market prices of the companies have been taken for the years of different dates, there by dividing the companies into 5 sectors.

） A final portfolio is made at the end of the year to know the changes (increase/decrease) in the portfolio at the end of the year.

Sources of the data:

The secondary data was collected from various financial books, magazines and from stock lists of various newspapers.

LIMITATIONS OF THE STUDY

➢ This study has been conducted purely to understand Portfolio Management for investors.
➢ Construction of Portfolio is restricted to two companies based on Markowitz model.
➢ Very few and randomly selected scrip's / companies are analyzed from BSE listings.
➢ Detailed study of the topic was not possible due to limited size of the project.
➢ There was a constraint with regard to time allocation for the research study i.e. for a period of 45 days.

THE DESCRIPTION OF PORTFOLIOS

Richard Grinold, provides a general framework for the description of various aspects of a portfolio using a set of factors. The work is cousin to the well –worn topic of performance analysis and attribution, and in that sense, is fairly represented as being old wine in new bottles the scope is much more general, however Grinold first provides a theoretical structure with a model that describes various aspects of a portfolio as either the allocation of a portfolio's variance or as the results in terms of the risk and correlation of portfolios. The expanded framework and portfolio focus opens up a wide range of problems that can be studied with the same framework. Grinold uses exampled to illustrate what the methodology can accomplish and as a guide to sense when we are asking too much from the model.

Roger Clarke, Harindra de Silva and Steven Thorley, Empirical studies document that equity portfolios constructed to have the lowest possible risk have a surprisingly high average returns. Roger Clarke, Harindra de Silva and Steven 53horley derive an analytic solution for the long-only Minimum-variance portfolio under

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the assumption of a single-factor covariance matrix. The equation for the optimal security weights has simple and intuitive form that provides several insights on minimum – variance portfolio composition. . The relatively small set of securities that remains has market betas below an analytically specified threshold beta. The ratio of portfolio beta to threshold beta dictates the portion of ex-ante portfolio variance that is market factor related. The authors verify and illustrate the portfolio mathematics using historical data on the U.S. equity market and explore how the single factor analytic results compare to numerical optimization under a generalized covariance matrix. The analytic and empirical results of this study suggest that minimum – variance portfolio performance is largely a function of the long – standing empirical critique of the traditional CAPM that low – beta stock have relatively high average returns.

Martin L. Leibowitz and Anthony Bova, An institutional fund typically has a multi- asset allocation the policy portfolio that is maintained overtime. When allocation shifts, the fund rebalances back to the policy portfolio. The discipline of the policy portfolio has many benefits: simplicity, convenient benchmarking, and a minimum of organizational frictions. It's very routine nature can lead, however, to an over emphasis on relative returns and insensitivity to fundamental changes in fund status and market structure. In 2003, the late Peter Bernstein questioned whether rigid adherence to the policy made sense, given frequent market dislocations and high levels of volatility. In this article Leibowitz and Bova attempt to shed further light on the Bernstein question by analyzing the risk tolerance and return assumption of a basic two- asset fund. One key finding is that policy portfolio rebalancing implicitly assumes that the risk tolerance and return premiums remain fixed overtime. But few funds have the sponsorship, liquidity, or organizational convictions to keep such a constant risk tolerance in the face of severely adverse markets.

Robert A. Jarrow, It is commonly believed that active portfolio management can generate positive alphas. This is partly based on the beliefs that positive alphas represent disequilibrium returns, which can exist in complex financial markets. In contradiction, this article shows that positive alphas represent arbitrage opportunities, not just disequilibrium returns. As persistent and frequent arbitrage opportunities much rarer, even in complex markets, Jarrow argues that positive alphas are more fantasy than fact. He introduces the notion of an unobservable factor that can generate false positive alphas, and which resolves the inconsistency between common belief and the sparsity of positive alphas.

Eric H. Sorensen, Jing Shi, Ronald Hua and Edward Qian, Fiduciary institutions are forging ahead to remove the traditional – only handcuffs that constrain the delivery of maximum net alpha by their equity managers. The proliferation of 130/30 managers promotes a question as to the optimal ratio for this constrained long – short strategies. Analysis of the range from long – only to fully unconstrained will help find the optimal solution that maximizes the risk – adjusted return. The ratio that maximize net information ratio depends largely on the risk budget, the chosen benchmark, leveraging costs, and the transaction cost associated with turnover. In the case of normal active risk (3%-5%) more alpha leverage is better than less. That is, despite the declining marginal benefits of higher leverage, 150/5 may be better than 120/20, approximating a pure market line neutral strategy.

Data analysis and interpretation:

Deriving the minimum risk portfolio, the following formula is used:

$$Wa = \frac{(sb)^2 - rab\,(sa)\,(\,b)}{(sa)^2 + (sb)^2 - 2rab\,(sa)\,(sb)}$$

Where,

Xa   is the proportion of security A

Xb   is the proportion of security B

 a = standard deviation of security A

 b = standard deviation of security B

rab = correlation co-efficient between A&B

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Companies	Minimum Risk Portfolio	
	Security A	Security B
NCL & L&T	0.42	0.58
MATRIX & HETERO DRUGS	0.55	0.45
BSNL & TATA COMMUNICATIONS	1.37	-0.37
HDFC & BANK OF INDIA:	0.45	0.55
TCS & HCL	0.60	0.40

CALCULATION OF PORTFOLIO RISK:

For two securities:

$$_P = \sqrt{sa^2*(Xa)^2 + sb^2*(Xb)^2 + 2rab*sa*sb*Xa*Xb}$$

Where,

$_P$= portfolio risk

Xa = proportion of investment in security A

Xb = proportion of investment in security B

R_{12} = correlation co-efficient between security 1 & 2

a = standard deviation of security 1

b = standard deviation of security 2

Companies	Portfolio Risk
NCL & L&T	22.34
MATRIX & HETERO DRUGS	12.36
BSNL & TATA COMMUNICATIONS	19.58
HDFC & BANK OF INDIA:	26.94
TCS & HCL	18.20

INTERPRETATION: According portfolio risk MATRIX & HETERO DRUGS performance is good because those companies facing low risk (12.36) when compared to other portfolios.

CALCULATION OF PORTFOLIO RETURN:

$Rp = W_1R_1 + W_2R_2$ (for two securities)

$Rp = W_1R_1 + W_2R_2 + W_3R_3$ (for three securities)

Where,

W1, W2, W3 are the weights of the securities

R1, R2, R3 are the Average returns

Companies	Portfolio Return
NCL & L&T	23.67
MATRIX & HETERO DRUGS	-13.1765
BSNL & TATA COMMUNICATIONS	-24.83
HDFC & BANK OF INDIA:	9.014
TCS & HCL	- 10.43

Interpretation: According portfolio return NCL & L&T performance is good because those companies gain high return (23.67) when compared to other portfolios.

STATEMENT OF COMPANY WISE AVERAGE RETURNS AND STANDARD DEVIATIONS

Company name	Average returns (%)	Standard deviations (%)
CEMENT INDUSTRY		
NCL	-4.59	60.38
L&T	44.14	45.73
PHARMACEUTICAL INDUSTRY		
MATRIX	-8.242	35.66
HETERO DRUGS	-19.21	43.26
TELECOM INDUSTRY		
BSNL	-3.80	22.32
TATA COMMUNICATIONS	53.03	44.01
BANKING INDUSTRY		
HDFC	-6.76	37.99
BANK OF INDIA	21.92	34.87
I.T. INDUSTRY		
TCS	-20.51	33.33
HCL	4.72	45.61

Interpretation: According to average retuns and standard deviarion of above companies reveals that L&T , BANK OF INDIA,TATA COMMUNICATIONS and HCL these companies are gained better returns as much as other companies. So those return gained companies performance is good by the securities invest in KARVY STOCK BROKING LIMITED.

STATEMENT OF PORTFOLIO RETURNS AND RISKS OF COMPANIES

Company name	Returns (%)	Risks (%)	Correlation coefficient®
CEMENT			
NCL			
L&T	23.67	22.34	-0.63
PHARMACEUTICAL			
MATRIX			
HETERO DRUGS	-13.1765	12.36	-0.80
TELECOM			
BSNL			
TATA COMMUNICATIONS	-24.83	19.58	0.82
BANKING			
HDFC			
BANK OF INDIA	9.014	26.94	0.10
I.T.			
TCS			
HCL	-10.43	18.20	-0.55

STATEMENT OF PORTFOLIO RETURNS AND RISKS OF COMPANIES

Companies	Correlation coefficient ®coefficient®
NCL L&T	-0.63
MATRIX HETERO DRUGS	-0.80
HDFC BANK OF INDIA	0.82
BSNL TATA COMMUNICATIONS	0.10
TCS HCL	-0.55

Interpretation: According to above graph in banking sector having positive correlation and telecom industry also having positive correlation. So these companies facing no risk. The remaing industries having negative correlation so they are facing less risk.

FINDINGS

The primary objective of these securities combination is to reduce risk of portfolio and to gaining the optimum return. The analytical part of the study reveals the following interpretations:

) As far as the average returns of the selected companies are concerned, TATA communications are performing well whereas other companies are concerned average return in isolation for the period of the study is very poor.

) The investors who are very much concern about the risk, can invest their funds in this combination. Rest of the portfolio combinations fall under the moderate risk category.

) Portfolio management is aimed at reducing inefficiencies that occur when undertaking a project and eliminating potential risks, which can occur due to lack of information or systems available.

) It helps the organization to align its project work to meet the projects whilst utilizing its resources to the maximum.

) Sector portfolio has given negative return in the month of the study as there is systemic risk as very high in the sector portfolio because of non diversification.

) All the individual companies and the portfolio showing very steady chart, there is very little movement in the performance chart.

SUGGESTIONS

) Select your investments on economic grounds. Public knowledge is no advantage.

) Buy stock with a disparity and discrepancy between the situation of the firm – and the expectations and appraisal of the public (Contrarian approach vs. Consensus approach).

) Buy stocks in companies with potential for surprises.

) Take advantage of volatility before reaching a new equilibrium.

) Listen to rumors and tips, check for yourself.

) Don't put your trust in only one investment. It is like "putting all the eggs in one basket ". This will help lessen the risk in the long term.

) The investor must select the right advisory body which is has sound knowledge about the product which they are offering.

) Professionalized advisory is the most important feature to the investors. Professionalized research, analysis which will be helpful for reducing any kind of risk to overcome.

CONCLUSION

) From the overall analysis of portfolio performance, it is observed that the NCL & L&T has highest portfolio returnRs of 23.67% with portfolio risk of 22.3 percent which indicates a better combination for investment.

) The investor who is a risk taker it is advise to go with the combination of HDFC & BANK OF INDIA which has a portfolio return of Rp 9.014 with portfolio risk   p

) Of 26.94 and as well as correlation coefficient of 0.10 which indicates a better combination for investment.

) It can be concluded from the project that future of portfolio management is bright provided proper regulations prevail and investor's needs are satisfied by providing variety of schemes.

) To manage stocks in that company is benefit to overall organization.

REFERENCES:

1.   Daily news papers
2.   NSE and BSE websites
3.   ROBBINS, Security Analysis & Portfolio Management, Tagore Publications,6th Edition