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"Diversification Application in Portfolio Management with respect to Risk and investment"

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Abstract

Portfolio management is building and seeing a selection of investments that will meet the long-term financial goals and risk tolerance factor of an investor. To create Investment portfolio by any Institution is considered as critical. Portfolio Asset management can be built in various avenues so as to minimize the risk and measure it. It can be done by using various investment avenues like Equity, Mutual and Borrowed funds. To optimize the portfolio data is the main objective using diversified techniques. VAR is considered as the technique to measure the risk factor of portfolio. Numerical results and outcomes of investments are considered in the research and presented. The main objective is to select the suitable investment criteria like if we want better returns, or consider risk factors, or liquidity or safety of principal. By this we can set our portfolio objectives and construct according to our needs and manage it with respect to the market conditions and the securities fairing in the market.

Introduction:-

Portfolio risk management is the collection and analysis of risks across individual portfolio investments, such as stocks, bonds, money market funds, and cash. Risk is the probability that actual investment returns are less than those that are projected. How to get the highest return on an investment possible. Investor needs to make investments by predicting risk. Portfolio risks include market risk, interest-rate risk, inflation risk, and credit risk.

- Market risk is the probability that the value of an investment follows the rise and fall of the stock market. Interest-rate risk is the risk that the value of an investment will fall as the interest rates rise. Inflation risk is the chance that the value of an investment declines because of the interest rate. Credit risk focuses on whether a bond issuer can repay a bond debt once it matures.
- In a diversified portfolio, the assets correlate with each other. When the value

of one variable rises, the value of the other falls. It lowers overall risk because, no matter what the economy does, some asset investments will benefit. That offsets losses in the other assets. Risk is also reduced because it is rare that the entire portfolio would be wiped out by any single event. A diversified portfolio is your best defense against a financial crisis. To manage the unpredictability of these risks, sampling technique is used. The investor's profile is based on the results of a questionnaire that the Investors completed. The target customers were only the retail investors who invest in various sectors so as to know about their knowledge and concern regarding the economy, principal invested, investment options, market conditions etc. According to the opinion of these investors interpretation has been done and there has been findings and conclusion along with some recommendations.

Objectives:-

1. To analyze different investment plan for better returns.
2. To study the risk factors in portfolio management.
3. To find out how to construct individual portfolio according to their needs and manage it with respect to the market conditions and the securities fairing in the market.
4. To study how much percentage of the investment funds to put into equities.

Hypothesis:-

Null Hypothesis: - Most of the investors prefer return as their investment criteria rather than risk.

Alternate Hypothesis: - Most of the investors don't prefer return as their investment criteria rather go for risk.

Research methodology:

This research is based on secondary data survey the opinions of Investors on different investment avenues. On the basis of historical data, both financial and statistical tools have been used for secondary data analysis. The outcome of the analysis is presented in a simple manner by using tables, graphs and diagrams.

Limitations:-The study is limited only to the analysis of different schemes and its suitability to different investors according to their risk-taking ability.

• The study is based on secondary data available from monthly fact sheets, websites and other books, as primary data was not accessible.
• The study is limited by the detailed study of Different types of investments
• Many investors are all price takers.
• The assumption that all investors have the same information and beliefs about the distribution of returns.
• The study excludes the entry and the exit loads of the mutual funds.

Data Analysis and Interpretation:-

Value at risk (VAR) is a widely used measurement technique of investment risk for

a single investment or a portfolio of investments. VaR gives the maximum loss on a portfolio over a specific time period for a certain level of confidence. Often the confidence level is chosen so as to give an indication of tail risk that is, the risk of rare, extreme market events.

For example, based on a VAR calculation, an investor may be 95% confident that the maximum loss in one day on a 100Rs.equity investment will not exceed Rs.4. The VaR (4Rs in this example) can be measured using three different methodologies. Each methodology relies on creating a distribution of investment returns,

Accuracy of VAR

Once a VaR methodology is chosen, calculating a portfolio's VaR is a fairly straightforward exercise. The challenge lies in assessing the accuracy of the measure and, thus, the accuracy of the distribution of returns. If the accuracy of the measure is particularly important for financial institutions because they use VaR to estimate how much cash they need to reserve to cover potential losses. Any inaccuracies in the VaR model may mean that the institution is not holding sufficient reserves and could lead to significant losses, not only for the institution but potentially for its depositors, individual investors and corporate clients. In extreme market conditions, the losses may cause Bankruptcy.

Backtesting is a technique used by the Risk managers to determine the accuracy of a VaR model. Backtesting involves the comparison of the calculated VaR measure to the actual losses (or gains) achieved on the portfolio. A backtest relies on the level of confidence that is assumed in the calculation. For example, the investor who calculated a one-day VaR of Rs.4 on a Rs.100 investment with 95% confidence will expect the one-day loss on his portfolio to exceed Rs.4 only 5% of the time. If the investor recorded the actual losses over 100 days, the loss would exceed Rs.4 on exactly five of those days if the VaR model is accurate. A simple backtest stacks up the actual return distribution against the model return distribution by comparing the proportion of actual loss exceptions to the expected number of exceptions. The backtest must be performed over a sufficiently long period to ensure that there are enough actual return observations to create an actual return distribution. For a one-day VaR measure, risk managers typically use a minimum period of one year for backtesting.

What Is the Formula for VaR?

VaR is defined as:

VaR = Expected Weighted Return of the Portfolio
- (Z-score of the confidence Interval * Standard deviation of portfolio) * portfolio value.

Risk is a concept that denotes a potential negative impact to an asset or some characteristic of value that may arise from some present process or future event. In everyday usage, risk is often used synonymously with the probability of a known loss. Risk is uncertainty of the income/capital appreciation or loss of the both. The total risk of an individual security comprises two components, the market related risk called Systematic Risk also known as undiversifiable risk and the unique risk

of that particular security called Unsystematic Risk or diversifiable risk.

INVESTMENT

Investment may be defined as an activity that commits funds in any financial form in the present with an expectation of receiving additional return in the future. The expectations bring with it a probability that the quantum of return may vary from a minimum to a maximum. This possibility of variation in the actual return is known as investment risk. Thus every investment involves a return and risk.

Investment is an activity that is undertaken by those who have savings. Savings can be defined as the excess of income over expenditure. An investor earns/expects to earn additional monetary value from the mode of investment that could be in the form of financial assets.

The three important characteristics of any financial assets are:

Return – the potential return possible from an asset

Risk – the variability in returns of the asset from the chances of its value going down/up.

Liquidity – the ease with which an asset can be converted into cash.

Investors tend to look at these three characteristics while deciding on their individual preference pattern of investments. Each financial asset will have a certain level of each of these characteristics.

An investor has wide range of investment avenues such as:

1. Non – Marketable Financial Assets
2. Equity Shares
3. Bonds
4. Mutual Fund Schemes

Steps of calculating VAR - Profit

For a given value-at-risk metric, the time is measured in units i.e. days, weeks, months. In this we have considered time 0 as now, so time 1 represents the end of the horizon. Portfolio's current market value 0p. Its market value 1P at the end of the horizon is unknown.

Here, as in other contexts, the use of convention that unknown (i.e. random) quantities are capitalized while known quantities are lower-case. Preceding superscripts indicate time, so 0p is the portfolio's known current value, and 1P is its unknown market value at the end of the horizon – at time t = 1.

Define portfolio loss 1L as

$$^{1}L = {}^{0}p - {}^{1}P$$

Findings,

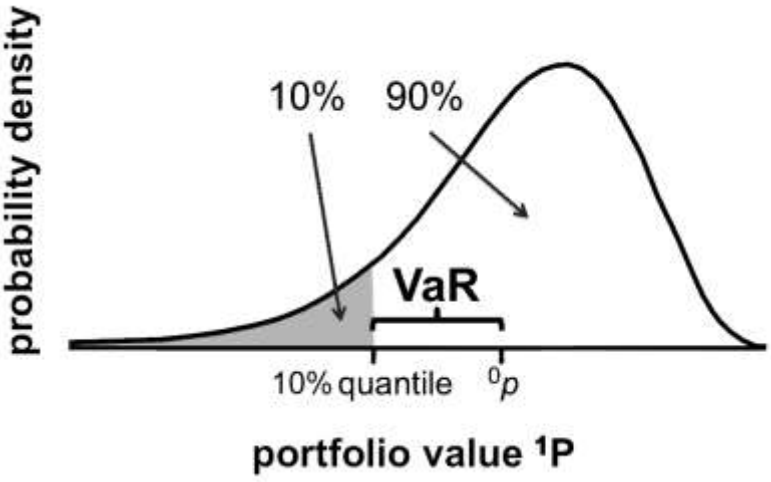
If 0p exceeds 1P, the loss will be positive. If 0p is less than 1P, the loss will be negative, which is another way of saying the portfolio makes a profit.

Calculating Value-at-Risk as a Quantile of Loss

Because we don't know the portfolio's future value 1P, we don't know its loss 1L. Both are random variables, and we can assign them probability distributions. That is exactly what a value-at-risk measure does. It assigns a distribution to 1P and/or 1L, so it can calculate the desired quantile of 1L. Most typically, value-at-risk

measures work directly with the distribution of 1P and use that to infer the quantile of 1L.

This is illustrated in Exhibit 1 for a 90% VaR metric. Working with the probability distribution of 1P, first the 10% quantile of 1P is found. Then, subtracting this from the portfolio's current market value 0p gives the 90% quantile of 1L. This is the portfolio's value-at-risk – the amount of money such that there is a 90% probability that the portfolio will either make a profit or lose less than that amount.



Portfolio's 90% VaR is the amount of money such that there is a 90% probability of the portfolio losing less than that amount of money—the 90% quantile of 1L. This exhibit illustrates how that quantity can be calculated as the portfolio's current value 0p minus the 10% quantile of 1P.

Following is the representation of Investment avenues with risk return. Considering the Profit from 10% to 90% with the help of above formula.

Ranking	Investment Avenues	Profit return with Var
1	Non- Marketable Financial Assets	30.23%
2	Equity Shares	47.3%
3	Bonds.	52%
4	Mutual funds	80%

From the above, we can interpret that the Mutual funds are safe to invest into with more percent of profit and less risk. Also Non- marketable assets have less return and are more risky to invest. This states that the Investment avenues are safer instruments to invest. According to the Back testing method the following are the conclusion

References:-
Journals:-

1. (Abel Olaleye , March 2011) - This paper reviewed the various options available to investors of diversifying within real estate portfolio. The area of property

portfolio diversification and performance analysis of property investments within real estate portfolio diversification were highlighted.

2. (J.C. Marylin, March 2011) - This study has found that the three most important risks facing the Mauritian banks are market risk followed by operational risk, and credit risk. The Mauritian banks are somewhat efficient in managing risk through diversification of portfolios. Finally, the results indicate that tool for risk management is used by Mauritian Banks for diversification of portfolio.

3. (Jastina Shiroka, March 2012) The investment of employee savings is exercised between necessity to relationship between risk and return or profit is positive, the higher the risk the higher the return. Pension funds invests in different classes of investments, always taking into consideration the need to find the alternative leading to high returns and low risk, increase of investment effectiveness, this paper is tasked with incitement to try to testify that portfolio diversification has positive effect in reduction of risk and in increase in performance of Trust investments.

4. (R.V. Naveenan , Feb. 2019) study is based on past data and comparison through measurement The risk and return analysis of equity portfolios was conducted through an evaluation of returns achieved through Standard Deviation and risk analysis done using Standard Deviation of returns, Beta and Sharpe's Ratio.

5. (Miljan Lokovic. August, 2018) The research has done comparative analysis between the
simple and efficient diversifications of investments, securities in portfolio and the testing of the
validity of the international diversification of investments. By this research it benefits of the
international diversification of investments are still substantial. The number of securities in a
portfolio should be increased as long as its marginal benefits, in the form of reduced investment
risk, exceed its marginal costs – in terms of increased portfolio management costs.

6. (Dare Jayeola, December 2017) , this research has studied the effects of Diversification is a
strategic option that investors use to optimize their portfolio. main purpose of study is to

minimizing risk or maximizing return of portfolio. It is an opportunity by which investors
improve from his micro-firm into macro-firm. Analyse procedures for constructing optimal
portfolio for rational investors. Also, the study demonstrates the benefits of diversification of
each asset in portfolio.

7. (Danilo Delfin, July 2020), This study find that real portfolios are poorly diversified
but highly similar, that portfolio similarity correlates with systemic fragility and that rebalancing
can come with an increased similarity depending on the initial network configuration. Research
says that large diversification gain is achieved through rebalancing but, noteworthy, that makes
the network vulnerable in front of unselective shocks.

8. (Alexander Abramov, September 2015),This study analyzes the impact of traditional
approach of portfolio management This article proves that for long-term investors, investments
in corporate bonds are more profitable in terms of the risk–return ratio than investments in
stocks, retail investors focused primarily on investments in fixed-income instruments, including
infrastructural bonds, that means to maintain a fixed risk–return ratio for a portfolio as the
horizon increases, an investor needs to increase the share of lower-risk financial assets during
asset allocation process.

9. (Caesar K. Simpson, May 2016) This study find out that international portfolio diversification
is the source of an entirely different world welfare gain, distinguishable from both the gains from
trade and the productivity gains from international factor movements, the implications of
international diversification are well known. This paper presents a theoretical and empirical
argument in favor of the International Investment Diversification Prudent to Either the Individual
or Corporate Investor? in the form benefits such as; Risk and reward; Diversification; New
market; Expertise of International Venture Capitalist; Culture integration; and Microfinance.

10. (Gilles Boevi, June 2020) Diversification is one of the major components of investment
decision-making under risk or uncertainty. Study goal is to correct this issue by reviewing the
concept in portfolio theory. The core of their study is focuses on the following diversification
principles: law of large numbers, correlation, capital asset pricing model and risk
contribution or risk parity diversification principles. & finally they explore

their measurement.