

An Analysis of How to Use the Sharpe Index Methodology to Build the Ideal Liquid Fund Portfolio

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ABSTRACT

Diversification is a strategy utilized by investors to mitigate risk and maximize returns, as they always desire lower risk. Combining two or more assets brings about the greatest return with the least amount of risk, which is known as diversification. A portfolio is made up of two or more assets combined. Two essential and significant components in the building of a portfolio are risk and return. When building a portfolio, every investor ought to attempt to minimize risk and increase profit. The portfolio with the lowest risk and maximum return is referred to as optimum. The most optimal model for creating an ideal portfolio is Sharpe's Index Model (SIM). This study attempts to use Sharpe's Index Model (SIM) to construct an optimal portfolio. The performance analysis and ranking of different mutual funds in India are done using the Sharpe index technique. The outcomes reveal that the SBI Liquid Fund is the greatest performing mutual fund, followed by both the UTI and PGMI liquid funds, while the NIPPON INDIA liquid fund is the least performing mutual fund.

Keywords- Liquid Mutual Fund, Capital Market, Sharpe's Index Model.

INTRODUCTION

When building a portfolio, two fundamental and crucial elements are risk and return. Whenever it involves portfolio constraints, the primary goal of any investor is to avoid risk and increase profit. The term "optimal portfolio" refers to the portfolio with the highest level of risk and the lowest. Portfolio selection is the process of choosing the best possible portfolio. Many scholars have looked for an empirical relationship between risk and return and how to leverage that relationship to build a better portfolio. Two theories are derived from these findings, namely: The Portfolio Theory and The Capital Market Theory. Harry Markowitz (1952, 1959) created the Portfolio Theory, which addresses portfolio selection intending to improve projected returns while maintaining an individual investor's manageable level of risk. The connection between investment decisions and prices for securities is established by Sharpe and associates in their Capital Market Theory. When combined, the capital market theory and portfolio theory offer a framework for describing and quantifying risk and the relationship it has to return.

Since the constantly shifting dynamics of the business environment today, investing opportunities are subject to continuous shifts. As a participant in the capital market, the mutual fund industry is quick to respond to new developments. Mutual fund firms have become increasingly common throughout time, and this pattern is projected to continue based on the two global economic conditions and overall economic growth. The future is anticipated to be bright, and academics are urged to look into the market's benefits and drawbacks. This is because many international mutual funds have established funds in India, and the industry has seen various mergers and acquisitions. This makes the study's attempt to analyze the growth pattern of the mutual fund industry concerning private and public sector mutual fund schemes as well as the performance evaluation of the fifteen most popular public and private sector mutual fund schemes—which were chosen based on their NAV and returns—justifiable. The study's conclusions will also increase the confidence of regular investors and justify their participation in mutual fund schemes.



The foundational principle of Sharpe's Index Model (SIM) is that the return on an asset may be thought of having been linearly associated with a single market index, indicating that stock movement influences all securities. The concept is that modifications to the stock market have an impact on all shares. A rising stock market generally results in higher prices for stocks, while a declining stock market usually leads to decreased stock prices. It is practicable, however, if not every one of the share values will change simultaneously. Different securities may have different price sensitivity to changes in the market.

LIQUID FUND

Bonds with a three-month maximum maturity are purchased by liquid funds. They are appropriate for holding the money you have saved for unexpected expenses or extra cash that you will not need for many weeks to a year. Better profits than those from a bank account are what you should anticipate.

Mutual funds that invest in securities with a residual maturity of up to 91 days are known as liquid funds. Since liquid funds do not have a lock-in period, invested assets are not permanently locked in.

Providing investors with a high level of liquidity and capital safety is the primary goal of liquid funds. The fund manager makes investments in high-rate debt securities that mature in 91 days as a result. The proportions allotted are in line with the fund's investing goal. The portfolio's average maturity of three months will be guaranteed by the fund management. This makes liquid funds less fragile and less sensitive to changes in interest rates in fund returns.

There are not many swings in the fund's value. Furthermore, the portfolio's maturity and the underlying securities' maturity are matched. It contributes to greater returns. Investing in liquid funds is a great way to hide away extra cash. These are safer havens with better returns than standard savings accounts. The goal of liquid funds is to mimic the liquidity of a savings bank account. There is no lock-in period for these funds. Liquid funds are a normal savings account that you can use to achieve better returns.

LITERATURE REVIEW

1. Making judgments in the face of uncertainty presents investors with the greatest challenge. In 1952, Harry Markowitz proposed that investors allocate their investments based on their wealth, with the idea of placing larger sums in more conservative areas (Elton et al. 2014). The mean (average) and variance (variant) approaches—where the mean represents the rate of return and the variant represents the amount of risk—are the foundation of Markowitz's portfolio theory. The mean-variance model, another name for Markowitz's portfolio theory, places an emphasis on choosing and assembling the ideal portfolio by maximizing expected return (mean) and minimizing risk or uncertainty (variant).
2. The study conducted by Sivabagyam, Vidya, Suganya, and Sandhiya (2019) investigated the risk return analysis of several growth option mutual fund schemes in India. The goal of the studies has been to determine which growth schemes among the mutual funds that have been chosen offer investors the highest returns at the lowest risk. Statistical methods such as Treynor ratio, BETA, Sharpe ratio, and Jensen's Alpha ratio are employed for the comparison in order to determine the right the end result. The research came to the conclusion that the SBI Banking and PSU Debt Fund, Axis Banking and PSU Debt Fund, and UTI Core Equity Fund securities performed better than the SBI Contra Fund and UTI Core Equity Fund.
3. In 2020, Choudhary, Nigam, and Ahmed Sayyed carried out a study that compared mutual fund programs. Sharpe's ratio, average maturity, yield to maturity, and total returns are the metrics and techniques that are used. To help investors comprehend the scheme's risk-adjusted performance, the study goes over the various metrics that may be used to determine which scheme performs better in which circumstance.
4. The study "Impact of Pandemic COVID-19 on Indian Mutual Fund Industry - An Analytical Study" was reviewed by Das and Samyabrata (2020). The effect of COVID-19 on the mutual fund industry's assets under management (AUM) and return has been the main focus of the research. According to the study's findings, the COVID-19 effect caused the overall AUM of the Indian mutual fund industry to drop by 9.82% between December 2019 and April 2020. For every period, the pre-COVID returns of all equity funds—aside from pharmaceutical funds— were higher than the post-COVID returns.



5. The study on Validation of Selection Techniques of Mutual Funds Schemes in India was reviewed by Rohatgi, Kavidayal, Bhushan, Singh, and Dixit (2020). The researchers' goal is to verify the mutual fund selection methods used in India, which include selecting all mutual fund schemes based on maximum net asset and ranking and selecting mutual funds based on return and risk frontier. In order to get the right answers for the research, statistical tools like Treynor and Sharpe ratios, average returns, beta and mean, and standard deviation are used. Axis Long Term Equity Fund - Direct Plan gets the top rating from both evaluation ranking methods utilizing the ratios, according to the study's findings, which were followed by ICICI Prudential Blue-chip Fund.

RESEARCH METHODOLOGY

Research Design: The researcher has selected a descriptive study design in this instance since it has extremely specified aims and definite data requirements.

Data Collection: Secondary data was primarily utilized by the researcher in this study as a data collection tool. The primary sources of secondary data will involve stock exchanges, manuals, annual reports and journals, company magazines, and websites such as amfiindia.com, rrfinance.com, and mutualfundindia.com. Monthly returns and net present value gathered throughout a year, from January to December 2023.

SCOPE OF THE STUDY

The scope of the study is to build the best possible portfolio for only liquid mutual funds to minimize risk and maximize returns. A portfolio should be constructed by selecting the most liquid mutual fund after a risk and return analysis of those funds is conducted.

Monthly returns and net present value gathered throughout a year, from January to December 2023.

SAMPLE OF THE STUDY

This paper discusses liquid mutual funds; ten mutual funds were selected for the investigation utilizing practical sampling methods. These are the chosen liquid mutual funds.

Table 1. Description of selected liquid mutual fund

Name of the Mutual Fund Company	Description of the Liquid Mutual Fund
SBI LIQUID FUND	Mr. R. Arun is the fund manager. The fund was established in 2007 to offer investments in a wide variety of debt and money market instruments with a maximum residual maturity of 91 days.
PGIM INDIA LIQUIDFUND	The manager of this fund is Mr. Ramesh Ramakrishnan. This fund was launched in 2007 with the goal of providing consistent returns and high liquidity through the purchase of a portfolio of short-term, high-quality debt and money market investments.
UTI LIQUID CASH FUND	Amandeep S. Chopra has been managing this fund. The fund was established in 2003 with the aim of producing consistent, modest returns with minimal risk and ample liquidity through a combination of money market instruments and superior debt.
ICICI PRUDENTIAL LIQUID FUND	This fund, which was launched in 2003 and invests in debt funds and money market securities for a maximum of 91 days, is managed by Mr. Rahul Goswami.
AXIS LIQUID FUND	This fund was launched in 2009 with the goal of offering high level liquidity, appropriate returns, and low risk compensation. Mr. Deving Shaa is the fund manager.
ABSL LIQUID FUND	Sunaina da Cunha has been the fund manager. Launched in 2013, the scheme aims

	to offer a high degree of safety, liquidity, and appropriate returns by means of prudent investments in premium debt and money market products.
KOTAK LIQUID FUND	Mr. Harish Krishna has been the manager of these funds. This open-ended fund, which launched in 2014, invests in debt and equity arbitrage.
TATA LIQUID FUND	The manager of this fund, Mr. Amit Somani, launched it in 2004 with the goal of providing unit holders with excellent liquidity and moderate returns.
HDFC LIQUID FUND	Mr. Anupam Joshi is the fund manager for these funds. This fund was established in 2000 with the goal of generating income through a portfolio of debt and money market instruments. However, there is no guarantee that the scheme's investment goal will be met.
NIPPON INDIA LIQUIDFUND	Since its introduction in 2003, this fund—which is managed by Mr. Anju Chhajer—has produced optimal returns while maintaining a high degree of liquidity and a reasonable level of risk.

TOOLS FOR ANALYSIS

Statistical instruments used in this study include the Sharpe Model, Expected return, and Standard deviation.

OBJECTIVES OF THE STUDY

1. To implement the Sharpe Single Index Model to build the best possible portfolio of liquid mutual funds from the specified fund, maximizing return on each individual liquid mutual fund.
2. Building a portfolio and selecting the best liquid mutual fund using the Sharpe Model computation as a foundation to assist investors in making risk-free, suitable investment decisions

DATA ANALYSIS

When evaluating the performance of various funds or portfolios, Sharpe's performance index concentrates on a single figure. It evaluates the risk premium of the portfolio in respect to the total amount of risk in the portfolio. The performance of a portfolio over a predetermined time period can be evaluated using this model. The Sharpe Index is a performance indicator that stands out for considering the risk in the portfolio and giving the highest values to the assets that have the best average rate of return after adjusting for risk. The difference between the average rate of return for the portfolio and the riskless rate of return is known as the risk premium.

The portfolio return, the risk-free rate of return, and the portfolio's standard deviation are the three things needed to use the Sharpe Index. You may compute the risk-free rate of return by taking the average return of a government bond or note over a period of time. The standard deviation of the portfolio, which indicates both the risk and the strength of the portfolio, is a measure of the systematic risk in the portfolio. Additionally, the portfolio will be regarded as non-diversified if the standard deviation is used in place of the **beta**.

Some Statistics of Sharpe index Model

$$\text{Sharpe Index} = \frac{\text{Portfolio average return} - \text{Risk free rate of return}}{\text{Standard Deviation of the Portfolio}}$$

$$St = \frac{Rp - Rf}{\sigma p}$$

HERE,

St = Sharpe Index

Rp = Portfolio average return
 Rf = Risk-free rate of return
 σp = Standard Deviation of the portfolio

$$\sigma_p = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{N}}$$

Standard Deviation = X = monthly return
 \bar{x} = average monthly return
 N = total number of periods
 S.D = Standard Deviation
 St = Sharpe index value

SHARPE INDEX MODEL EVALUATION OF LIQUID MUTUAL FUNDS SCHEMES

Table 2. Sharpe Index Model based on Liquid Mutual Funds

SR. No.	Name of the Mutual Fund	Average Return %	S.D	St
1	ICICI PRUDENTIAL LIQUID FUND	3.179%	0.2181	5.86
2	HDFC LIQUID FUND	3.167%	0.2777	4.92
3	SBI LIQUID FUND	3.272%	0.2266	6.41
4	ABSL LIQUID FUND	3.215%	0.2685	5.20
5	NIPPON INDIA LIQUID FUND	3.177%	0.2939	4.65
6	KOTAK LIQUID FUND	3.181%	0.267	5.17
7	AXIS LIQUID FUND	3.235%	0.2525	5.56
8	UTI LIQUID CASH FUND	3.235%	0.2324	6.02
10	TATA LIQUID FUND	3.1808%	0.2756	4.97

S.D = Standard Deviation St = Sharpe index value

According to the above Table 2, all mutual funds have a positive value for "St." The Sharpe Index states that the best performance is indicated by the highest value, while the worst performance is indicated by the lowest value.

Of the ten mutual funds that were chosen, SBI Mutual Fund has the highest St Value—176.13— among them all in India. Thus, based on the Sharpe Index, this is the best mutual fund among them. Therefore, it is recommended that an investor choose this fund to include in his portfolio.

FINDINGS OF THE STUDY

According to the Sharpe Index value, liquid mutual funds were ranked from best to worst.

Name of the Liquid Mutual Fund Company	Rank
SBI LIQUID FUND	1
PGIM INDIA LIQUID FUND	2
UTI LIQUID CASH FUND	3
ICICI PRUDENTIAL LIQUID FUND	4
AXIS LIQUID FUND	5
ABSL LIQUID FUND	6
KOTAK LIQUID FUND	7
NIPPON INDIA LIQUID FUND	8



The mutual funds are ranked from best to worst in the above table. The best mutual fund plan for investments can be selected. In order to maximize earnings and minimize risk, an investor is advised to select the mutual fund scheme with the best performance in his portfolio. SBI is the top-performing mutual fund after a year-long analysis of data, followed by UTI and PGMI, while NIPPON INDIA is the worst-performing mutual fund.

1. A multitude of details regarding the performance of the funds in one's portfolio can be obtained from the aforementioned analysis. Comparing and contrasting the performance of different mutual funds is easy. It is feasible to make the following discovery.
2. With the shape index technique, mutual fund performance may be easily evaluated. While the fund with the highest 'St' value performs well, the one with the lowest 'St' value performs poorly. It also illustrates how useful the Sharpe index approach is.
3. Choosing the best mutual fund scheme can be challenging for investors due to the abundance of options available. This paper provides a sufficient and necessary result to help choose the optimal portfolio to maximize return and minimize risk.
4. Standard deviation and mean are very essential statistical tools to use in order to get a meaningful conclusion. It is impossible to utilize the Sharpe index approach without using the average and standard deviation.
5. It is simple to determine which funds are the most effective and efficient given their worse performance.

CONCLUSIONS AND SUGGESTIONS

It is well known that the most common and secure investment option available today is through mutual funds. It is simple to conclude that there will be sufficient mutual fund options available in India for a considerable amount of time when taking into account both the current and potential future of the industry. Investors can use the easy-to-understand Sharpe index concept to identify mutual funds that are performing well and those that are not. It also provides crucial details regarding the risk and return of the investment. The standard deviation of the portfolio indicates the degree of risk. The investor will have an easy time selecting a portfolio if they are well informed about the risk and return of the fund.

The Sharpe index model lets you compare all the pertinent data along with multiple mutual fund strategies. The Sharpe value is used to rank the results after the comparison. While the fund with the highest 'St' value performs well, the one with the lowest 'St' value performs poorly. It helps an investor identify the mutual funds that perform the best and worse. Investors also need to take the companies' goodwill into account, in addition to market factors including industry trends, sales economics, and government legislation.

The sector will have a bright future if the government, the RBI, and SEBI take swift, decisive action along the lines mentioned above. This is because normal investors are becoming more aware of the business and the growing economy, and mutual funds have enormous potential.

This research is easy to understand and offers numerous advantages to an investor. Among the recommendations are the following ones:

- Market factors including sales economics, government regulations, and industry trends should all be taken into account when selecting a portfolio.
- At present, investors have enough money to put into a range of projects. They are continuously searching for statistical strategies that will provide them with the highest return while posing the least risk. The greatest choice in this situation is mutual funds.

The majority of mutual fund investors started their investment careers with MF, therefore in order to build a lasting relationship with their customers, MF promoters must be more open and truthful in their advertising performance. To expand their clientele and set themselves apart from other establishments, mutual fund promoters must concentrate on counseling individual investors, especially those residing in underserved and rural areas. They have to provide information about risk as well as other relevant topics, like financial performance, manager bio, distribution expenses, percentage of SEBI fees paid, total expense ratio, disclosure portfolio turnover, and related transaction charges.



To safeguard the interests of investors, SEBI ought to mandate that intermediaries reveal that they act as agents for specific mutual funds and the commission rate they get. In order to regulate Mutual Funds by strict action and punishment and to deter unethical activity, SEBI must adopt a "regulator-and-investor" approach. The government needs to provide the SEBI the power to prosecute perpetrators of wrong. Moreover, it is necessary to expose defaulters in public through the media.

REFERENCES

- [1]. Mr. K.R. Sivabagyam, Mrs. Shruthi. P, Mr. Vidya. M, Mrs. Suganya. P, Mrs. Sandhiya. V (2019). A Research on Risk Return Analysis of Selected Growth Option Mutual Fund Schemes in India. International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8 Issue-12S.
- [2]. Mr. Sachin Kumar Rohatgi, Prof. P.C. Kavidayal, Mr. Bhakti Bhushan Mishra, Dr. Krishna Kumar Singh, Dr. Anjali Dixit(2020). Validation of Selection Techniques of Mutual Fund Schemes in India. International Journal of Recent Technology and Engineering (IJRTE)
- [3]. Mr. Sourav Kumar Das, Dr. Samyabrata Das (2020). Impact of Pandemic COVID-19 on Indian Mutual Fund Industry - An Analytical Study. Journal of Critical Reviews VOL 7, ISSUE 16.
- [4]. Isha Roy Choudhary, P. P. (2020). Performance Analysis of Indian Mutual Fund Schemes - A Comparative Study- International Journal for Research in Applied Science & Engineering Technology.
- [5]. Punithavathy Padian (2007), “Security Analysis and Portfolio Management”, New Delhi: Vikas Publishing House Pvt Ltd.
- [6]. V.K Bhalla(2007), “Investment Management”
- [7]. www.amfiindia.com
- [8]. www.rffinance.com
- [9]. www.mutualfundsindia.com
- [10]. www.sebi.gov.in www.rbi.org.in