



A Treynor Ratio: A systematic risk adjustment tool for Mutual Funds

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Abstract:

This paper explores the domain of Mutual Funds, with a specific focus on analysing the performance of private and public sector funds in India. The study conducts a thorough analysis of tax-saving Mutual Fund schemes, assessing the financial performance of specific funds during a designated timeframe. Financial metrics such as average return, beta, standard deviation, Treynor Ratio are used to evaluate the risk-return characteristics of these funds. Through the process of evaluating the performance of various investment schemes, investors can make well-informed decisions in order to optimize their investment portfolios. Moreover, the study illuminates the comparative performance analysis of Mutual Funds sponsored by the public and private sectors. This offers valuable insights for investors who aim to optimize returns while effectively managing risks in the ever-changing Mutual Fund industry.

Keywords:

Mutual Funds, Performance Analysis, Private Sector Banks, Public Sector Banks, Open-Ended Tax Saving Schemes, Financial Metrics, Risk-Return Profile, Treynor Ratio, Comparative Analysis, Investment Portfolios, Risk Management, Financial Performance, Investor Decision-Making, Mutual Fund Industry.

Introduction:

In developing nations, the financial system serves a crucial role in fostering economic growth. Investment in an economy can be categorized as either inventories or fixed capital assets. The economic progress of a nation is contingent upon the expansion of fixed capital. The financial assets offered by the financial system have a significant impact on the formation of capital in the economy, and vice versa. Therefore, the economic progress of a nation relies, among other factors, on the expansion of its financial system. A higher ratio of financial assets to real assets allows for greater potential for development. This is because economic growth relies on sufficient investment, which can only be facilitated by the financial system. Finance is a crucial factor in the production process, and therefore, a well-developed financial system is a necessary requirement for economic growth.

The four major components that comprise the Indian Financial System are:

- Financial Institution
- Financial Market
- Financial Instruments and
- Financial Services

Financial Instruments:

Financial instruments are contractual agreements involving money between two or more parties. Financial assets, securities, or other financial instruments are the products that are exchanged in a financial market. Financial instruments are documents that represent claims on assets. Investment refers to the allocation of funds into assets with the goal of generating additional income or increasing the value of the investment over time. Investment assets can range from safe to risky.

The content is partitioned into two distinct sections. There are two types of investments: Marketable Investments, which are negotiable securities, and Non-marketable investments, which are non-negotiable securities. One example of an investment instrument is a Mutual Fund. Index funds are a low-stress and effortless investment option that provide automatic diversification of investments. Mutual funds gather the savings of individual investors, allocate them into government and corporate securities, and generate earnings through interest and dividends.

The text refers to the regulations established in 1996 by the Securities and Exchange Board of India specifically for mutual funds. [Most recent revision made on August 3, 2022]. According to the SEBI guidelines on categorization and rationalisation of schemes issued in October 2017, mutual fund schemes are categorised as:

- Equity Schemes
- Debt Schemes
- Hybrid Schemes
- Solution-Oriented Schemes—For Retirement and Children
- Other Plans—Index Funds, ETFs, and Funds of Funds

Objectives:

To study the performance of few schemes by using a Treynor model between private sector and public sector funds.

Hypothesis:

There is no significant difference between the performance of public sector and private sector funds.

Literature Review:

(Alekhya, 2012) The highlights of this study about the returns given by AMC Mutual Funds are based on a comparative analysis. Mutual funds are investment vehicles where people with similar investment objectives come together to pool their money and invest. Increase domestic savings and market investment to achieve this. 75% of people are investing in post office, money market, and bank deposits. One major reason for mutual fund failure is a lack of awareness in rural areas. Private sector mutual fund schemes are performing better than public sector mutual fund schemes. It shows that investing for a longer period would get an absolute higher return than the risk-free rate of return.

(Raj et al., 2018) This study compares the effort and performance of private sector mutual funds (HDFC Mutual Fund) and public sector mutual funds (SBI Mutual Fund) in growth and balanced mutual funds. To measure this study, use a tool of standard deviation, correlation coefficient, Beta, Sharpe ratio, and Treynor Ratio. And they found that SBI mutual funds did better than HDFC mutual funds because they had higher returns, lower standard deviations, which meant less volatility; lower beta values, which meant less risk; a high Sharpe Ratio, which put the fund at the top of the list for how desirable it was; and a high Treynor ratio, which meant that the fund did well in relation to systematic risk.

(Holden et al., 2021) The author provides a comprehensive analysis of a portfolio of active mutual funds and ETFs through the lens of risk factors. author comes to the conclusion that the features of mutual fund portfolios make it unclear why funds don't take advantage of well-known return premia and how their portfolio choices affect asset prices in equilibrium.

(Challa, 2018) The purpose of this study is to assess the importance of digitalization in the mutual fund industry as compared to traditional methods. It provides investors with the opportunity to invest in a diversified portfolio with lower risk and the assurance of professional management One of the digital revolutions, Paytm, has recently started an app called Paytm Money to capture the huge market of mutual funds. And it is the prime responsibility of SEBI, AMFI, and all companies to improve the marketing strategies and increase the surplus of the people and mutual fund industry.

(David & Venkatachalam, 2018) This paper examines the rationale, mandates, and financing activities of these two categories of financial architecture within the context of India and Japan. and also focuses on two different types of mechanisms: India is committed to speeding up the transition through PPPs. But in the capital markets of both countries, institutional investors like insurance and pension funds are also looking at green bonds as a way to complement the PPP and GIB approaches.

(Debasish, 2009) The author made a study of the performance of selected schemes of mutual funds based on risk-return relationship models and measures. The performance of mutual fund products becomes more complex in both return and risk measurements while giving due importance to investment objectives. The limitation of this study is that only open-ended growth-oriented schemes have been analysed for the sample mutual funds. In the future, researchers may try to look into and compare closed-ended and open-ended schemes, as well as debt-based and equity-based growth-oriented schemes.

(H Kara, 2014) Financial economists have long been puzzled by investor demand for actively managed funds that generate, on average, negative after-fee, risk-adjusted returns. The authors conclude that the well-known underperformance of the average actively managed fund in the full sample is driven by the large fraction of funds with weak incentives to identify and motivate skilled managers.

(Ibikunle & Martí-Ballester, 2022) In this study, we conducted the first comparative analysis of the financial performance of global water mutual funds with conventional, environmental, and natural resources mutual funds Finally, this study also found that investors, increasingly cognizant of the regulatory risk they assume when investing in certain sectors that are perceived as pollutive, are demanding higher returns for investing in those sectors and related assets. In addition, they could extend our analysis of the effects of size, expenses, and SRI labelling of funds on mutual fund performance by examining the effects of manager and fund characteristics, such as fund age and the contribution of asset allocation, on mutual fund performance.

(Kaniel & Wang, 2021) In this study, the author addresses, using new SEC data, how funds use derivatives and how derivatives contribute to performance. The N-PORT reports are a new requirement, it will likely be a couple of years before the second and third extensions can be carefully thought about.

(Thakuria & Kashyap, 2017) This study investigates the performance of selected public and private sector funds from seven different Assets Under Management (AUM) mutual fund companies for the period from April 2015 to March 2020. Considering the interests of various investors in mutual funds, schemes are evaluated on the basis of financial tests like average return, beta, standard deviation, Sharpe Ratio, and Treynor Ratio. Different statistical measures give information about the risk and return of a fund's performance. This lets investors choose the best mutual fund for the highest return with the least risk.

(R. Kaur, 2012) This paper focuses on the financial performance of tax-saving mutual fund schemes of the top five mutual funds. This study paper is based on AUM (Asset Under Management). The investor gets a better investment decision by making the major objective to analyse the financial performance through ratio analysis (Sharpe Ratio, Treynor Ratio, and Jensen Ratio) and statistical tools (Standard Deviation, Beta).

This result would help the investor, based on their past performance, to find a better investment option and understand the risk and returns of each mutual fund scheme.

(Kole, 2020) This study aims to calculate how the performance of mutual funds is assessed and graded when analysing and assessing the net asset value and their individual return on live investment avenues. And this consists of secondary data assessment and analysis. It is concluded the ranking and analysis of funds supported 3 ratios called Jensen's, Treynor's, and Sharpe's. At the end of the study, the author will be able to take a firm decision about where to invest in and how much risk-free return we will be able to get.

(Maqbool, n.d.) This study aims to know how the performance of mutual funds is assessed and ranked so as to measure investment avenues. Sharpe, Treynor, and Jensen measured mean return, variance, standard deviation, and beta on historical data of selected funds from S & P, CNX, Nifty, and index for the period 2007-2008 using statistical tools. Therefore, it can be said that the proper balance between selectivity and diversification has not been maintained. This is due to the fund manager's poor investment planning of the funds.

(Reddy & Sreeram, 2020) The author analyses the selected Equity Linked Saving Scheme (ELSS) mutual fund's performances against those of private sector banks and public sector banks' open-ended tax saving schemes. To measure this study, we have to use the Sharpe, Treynor, beta, Jensen, alpha, and appraisal ratio. The mutual funds are measured by different performance evaluation techniques like CAGR, average return, standard deviation, CV, risk adjusted measures etc. The study finds that, on average, all ELSS funds have done better than the market index.

(Sridevi, 2018) The present paper investigates the performance of mid-cap and small-cap schemes of three balanced funds each for the period from March 31st, 2016 to April 1st, 2017. The analysis assessed various financial tests like Average Return, Sharpe Ratio, Treynor Ratio, Jensen's Ratio, Standard Deviation, Beta and Alpha. The analysis has reported diverse and varied results. Results of the study have shown that out of the two schemes, both mid-cap and small-cap funds, have evidence of outperforming the benchmark return. Not all the funds have represented positive values. However, from the above study, it can be said that the schemes have diversified results.

Research Methodology:

This study aims to assess the strategies employed by various private and public entities in the mutual fund industry. This study employs an empirical research design to analyse data collected from multiple websites of AMFI and BSE. The study focuses on a limited number of private and public funding schemes. The data utilised in this analysis is derived from secondary sources, and the objective of the study is to examine the performance of the chosen mutual units.

Time Period of the Study:

A time frame of 4 years, specifically from April 2019 to March 2022, has been selected to analyse the performance of the Indian mutual fund industry. Exclusively secondary data is utilised to analyse the performance of mutual funds.

Data Analysis and Interpretation:

The Treynor Ratio is a portfolio performance measure that adjusts for systematic risk. In contrast to the Sharpe Ratio, which adjusts return with the standard deviation of the portfolio, the Treynor Ratio uses the portfolio beta, which is a measure of systematic risk. These ratios are concerned with the risk and return performance of a portfolio and are a quotient of return divided by risk. The Treynor Ratio is named after Jack Treynor, an American economist known as one of the developers of the Capital Asset Pricing Model. The Treynor ratio is calculated with the following formula:

$$T = \frac{(r_p - r_f)}{\beta_p}$$

$T = Treynor Ratio$

$r_p = Portfolio's return$

$r_f = Risk Free Rate$

$\beta_p = Beta of the Portfolio$

Step 1

a. **Return: The returns are computed as follows:**

$$R_p = \frac{NAV_{t+1} - NAV_T}{NAU_t} \times 100$$

Where R_p is return on the fund during the period 't' where 't' stands for time and NAV stands for Net Asset Value of the fund.

$$R_M = ((Index_{x+1} - Index_t) / Index_t) * 100$$

Where ' R_m ' is the returns on the basis of the market index.

b. **Mean :** The mean daily return for the month and year is calculated as below:

$$\text{Mean return} = \Sigma R_i / n$$

$n =$ number of days or year & R_i – daily returns

Step 2

Beta(β) is calculated as below;

$$(\beta) = [\text{Cov.}(R_i, R_m) / \text{Var.}(R_m)]$$

$$\text{Cov.}(R_i, R_m) = \Sigma(D_i - D_m) / n$$

& $R_m =$ Market Return

Step 3

Calculation of Treynor's reward- variability measure:

$$T = \frac{(r_p - r_f)}{\beta_p}$$

Performance of Mutual Funds of last four years.

	2021-22				
Scheme Name	NAV	Beta	Rf	Treynor	Rank
Private Sector					
Axis Banking & PSU Debt Fund	3.83	-24.70	6	0.09	4
ICICI Prudential Corporate Bond Fund	0.25	0.28	6	-20.65	9
Kotak Bond Fund	5.16	0.87	6	-0.96	7
Mirae Asset Cash Management Fund	17.18	92.46	6	0.12	3
IDFC Arbitrage Fund	4.36	-1.86	6	0.88	2
Public Sector					
Aditya Birla Sun Life Tax Plan	-2.28	79.79	6	-0.10	5
LIC MF BANKING & FINANCIAL SERVICES FUND	9.09	3.03	6	1.02	1
DSP Credit Risk Fund	10.86	-0.69	6	-7.01	8
SBI Savings Fund	3.94	0.02	6	-102.45	10
Canara Robeco Conservative Hybrid Fund	1.26	20.71	6	-0.23	6

Interpretation:

1. In the above year 2021-22, the above table shows that there are 10 Exchange Traded Funds in which are listed under NSE. The highest return is 17.18% which is given by Mirae Asset Cash Management Fund and its benchmark is NSE. And the lowest return is -2.28% by Aditya Birla Sun Life Tax Plan Fund. And the next lowest is 0.25% by ICICI Prudential Corporate Bond Fund.
2. In 2021-22 out of 10 Mutual fund, 7 mutual funds are having positive beta and 3 Exchange Traded Funds are having negative beta.
3. As per Treynor's Ratio, LIC MF Banking & Financial Services Fund Ranked top among the selected 10 mutual fund and it is traded in NSE, in the same year under Treynor's Ratio, SBI Savings Fund is ranked lowest and it is debt mutual fund.

	2020-21				
Scheme Name	NAV	Beta	Rf	Treynor	Rank
Private Sector					
Axis Banking & PSU Debt Fund	7.83	-19.80	6	-0.09	6
ICICI Prudential Corporate Bond Fund	0.68	0.01	6	-767.60	10
Kotak Bond Fund	8.40	-0.18	6	-13.54	9
Mirae Asset Cash Management Fund	60.95	9.41	6	5.84	4
IDFC Arbitrage Fund	4.00	-0.12	6	17.10	2
Public Sector					
Aditya Birla Sun Life Tax Plan	51.27	7.18	6	6.31	3
LIC MF Banking & Financial Services Fund	3.59	5.58	6	-0.43	7
DSP Credit Risk Fund	7.00	-0.14	6	-7.30	8
SBI Savings Fund	5.56	-0.01	6	72.91	1

Canara Robeco Conservative Hybrid Fund	11.28	1.70	6	3.11	5
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Interpretation:

1. In the above year 2020-21, the above table shows that there are 10 Exchange Traded Funds in which are listed under NSE. The highest return is 60.95% which is given by Mirae Asset Cash Management Fund and its benchmark is NSE. And the lowest return is 0.68% by ICICI Prudential Corporate Bond Fund. And the next lowest is 3.59% by LIC MF Banking & Financial Services Fund.
2. In 2020-21 out of 10 Mutual fund, 5 mutual funds are having positive beta and 5 Exchange Traded Funds are having negative beta.
3. As per Treynor's Ratio, SBI Savings Fund Ranked top among the selected 10 mutual fund and it is traded in NSE, in the same year under Treynor's Ratio, ICICI Prudential Corporate Bond Fund is ranked lowest and it is debt mutual fund.

	2019-20				
Scheme Name	NAV	Beta	Rf	Treynor	Rank
Private Sector					
Axis Banking & PSU Debt Fund	8.92	0.25	6	11.76	2
ICICI Prudential Corporate Bond Fund	0.44	0.31	6	-18.07	8
Kotak Bond Fund	11.95	0.37	6	16.27	1
Mirae Asset Cash Management Fund	-30.26	9.31	6	-3.90	5
IDFC Arbitrage Fund	6.77	-0.13	6	-5.86	6
Public Sector					
Aditya Birla Sun Life Tax Plan	-27.58	8.63	6	-3.89	4
LIC MF Banking & Financial Services Fund	3.86	-0.77	6	2.80	3
DSP Credit Risk Fund	-31.75	0.14	6	-274.75	10
SBI Savings Fund	3.01	0.07	6	-42.15	9
Canara Robeco Conservative Hybrid Fund	-5.83	2.01	6	-5.88	7

Interpretation:

1. In the above year 2019-20, the above table shows that there are 10 Exchange Traded Funds in which are listed under NSE. The highest return is 11.95% which is given by Kotak Bond Fund and its benchmark is NSE. And the lowest return is -31.75% by DSP Credit Risk Fund. And the next lowest is -30.26% by Mirae Asset Cash Management Fund.
2. In 2019-20 out of 10 Mutual fund, 8 mutual funds are having positive beta and 2 Exchange Traded Funds are having negative beta.
3. As per Treynor's Ratio, Kotak Bond Fund Ranked top among the selected 10 mutual fund and it is traded in NSE, in the same year under Treynor's Ratio, DSP Credit Risk Fund is ranked lowest and it is debt mutual fund.

Scheme Name	2018-19				
	NAV	Beta	Rf	Treynor	Rank
Private Sector					
Axis Banking & PSU Debt Fund	8.80	0.22	6	12.76	2
ICICI Prudential Corporate Bond Fund	0.48	0.09	6	-62.12	10
Kotak Bond Fund	7.56	0.23	6	6.82	3
Mirae Asset Cash Management Fund	2.92	9.24	6	-0.33	4
IDFC Arbitrage Fund	6.93	-0.33	6	-2.84	8
Public Sector					
Aditya Birla Sun Life Tax Plan	-4.62	8.03	6	-1.32	6
LIC MF Banking & Financial Services Fund	5.17	0.93	6	-0.90	5
DSP Credit Risk Fund	-2.03	0.19	6	-42.84	9
SBI Savings Fund	3.62	-0.11	6	21.63	1
Canara Robeco Conservative Hybrid Fund	0.34	2.47	6	-2.29	7

Interpretation:

1. In the above year 2018-19, the above table shows that there are 10 Exchange Traded Funds in which are listed under NSE. The highest return is 8.80% which is given by Axis Banking & PSU Debt Fund and its benchmark is NSE. And the lowest return is -4.62% by Aditya Birla Sun Life Tax Plan. And the next lowest is -2.03% by DSP Credit Risk Fund.
2. In 2018-19 out of 10 Mutual fund, 8 mutual funds are having positive beta and 2 Exchange Traded Funds are having negative beta.
3. As per Treynor's Ratio, SBI Savings Fund Ranked top among the selected 10 mutual fund and it is traded in NSE, in the same year under Treynor's Ratio, ICICI Prudential Corporate Bond Fund is ranked lowest and it is debt mutual fund.

Conclusion:

The study was carried out to evaluate the performance of 10 mutual funds of different companies and mutual fund schemes in India between April 2021 and March 2022. The performance of these is analysed in terms of risk and return.

Some of the schemes have given positive returns over the study period, some have not.

1. In the years 2021-22, the highest Treynor ratio is 1.02%.
2. In the years 2020-21, highest Treynor ratio is 72.91%.
3. In the year 2019-20, 16.27% is the highest Treynor ratio.
4. In the year 2018-19, highest Treynor ratio is 21.63%.

It is concluded that private sector mutual funds perform better than public sector mutual funds. We can say that all of the selected private and public sector mutual funds are less risky because their beta values are less than 1.00.

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