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STUDY ON PERFORMANCE OF EQUITY MUTUAL FUNDS AND ETF WITH THE BENCHMARK INDEX

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ABSTRACT: The research examines key financial metrics using a paired samples t-test, focusing on Beta, Sharpe Ratio, Jensen's Alpha, and Treynor Ratio. It finds no significant differences in these metrics, suggesting stability. However, the Sharpe Ratio changes significantly, indicating a shift in risk-adjusted returns. The research also provides insights into Exchange Traded Funds (ETFs) and mutual fund performance, offering practical applications and real-world insights into mutual fund performance. It contributes valuable insights into the performance dynamics of the analysed financial instruments, serving as a valuable resource for researchers, investors, and financial practitioners alike.

INTRODUCTION

The emergence of exchange-traded funds (ETFs) for passive investing has become a long-term trend in global investment. Since the introduction of the Nifty Bees ETF in 2001, the amount of assets following passive equities in India has increased to almost \$20 billion, or 18% of the equity fund market. ETFs are more efficient than index mutual funds, as they represent a proportionate interest in a pooled asset and can be shorted, margined, loaned, or exposed to various tactics. The Indian ETF industry's evolution began in 2001, with Gold ETFs dominating the market for the first few years. The 2013 budget allowed ETFs to be included in the pension fund universe and lowered securities transaction taxes to match mutual fund levels. By 2018, other ETFs accounted for 94% of the total assets.

ETFs are SEC-registered investment companies that provide investors with the opportunity to pool their money into a fund that invests in stocks, bonds, or other assets. They do not directly redeem or sell individual shares to or from retail investors, unlike mutual funds. Instead, ETF shares are traded at market prices, which may or may not coincide with the NAV of the shares, throughout the day on national stock exchanges. Authorized participants, financial institutions, usually big broker-dealers, are the only ones who normally buy and redeem shares straight from the ETF. They pay for the creation units through an exchange of securities and other assets in a basket that closely resembles the portfolio of the ETF. After receipt of the block of ETF shares, an Authorized Participant may sell the ETF shares to investors on the secondary market. When the market price of an ETF share exceeds the value of its underlying holdings, the ETF share trades at a premium, and when the market price is less than the value of its underlying holdings, the ETF trades at a discount. An ETF must determine its NAV at least once every 24 hours.

There is potential for robust co-integration between mutual funds and market index returns, indicating a reciprocal influence. Mutual funds are designed to allow investors to choose a scheme based on risk, investable amount, goals, and investment term. Mutual funds are required by law to price their shares each business day, usually after the major U.S. exchanges close. The NAV of mutual funds is the per-share value of the mutual fund's assets minus its liabilities.

Benchmark indexes serve as a standard for measuring the performance of a security, investment portfolio, or investment manager. By tracking the performance of benchmark indices, investors can understand how well their investments are performing compared to the market or sector. The financial sector of India, including banking, non-banking financial companies, and the insurance industry, is highly influential in the real economy as they create credit and mobilize savings. The pandemic has had an impact on the indices of this sector globally and India in particular. This study aims to assess the movements in the 'Nifty 50' and Nifty sectoral indices with specific reference to the financial sector indices due to their significance in the economy.

LITERATURE REVIEW

The paper investigates the research paper of Zheng, Xinrui (2021) that fund management, particularly mutual funds (MFs) and exchange-traded funds (ETFs). The first essay investigates asset managers' decision-making process when launching ETFs, with a focus on revenue generation and cost reduction. The ETF sector benefits from economies of scale, which allows larger families to gain from specialization while putting pressure on smaller families to grow their product offerings. The second article investigates the impact of management turnover and competition on US sub-adviser mutual funds (MFs), finding little evidence that fund families' sub-adviser selection selections boost MF performance.

The research also considers the research of Shivangi Agarwal, Nawaz's Mishra (2017) which says that 90% of the schemes outperformed their benchmark. It implies that the funds performed better at the time of research, therefore investors seeking consistent returns may consider investing in these schemes. Many ETF transactions take place on secondary markets, where investors bear the capital gains and liquidity expenses, resulting in increased efficiency and fairness. (Shivraj Ramachandran, Nilesh Saha.2020)

A mutual fund is an SEC-registered open-end investment company that pools money from many investors and invests the money in stocks, bonds, short-term money-market instruments, other securities or assets, or some combination of these investments. The combined securities and assets the mutual fund own are known as its portfolio, which is managed by an SEC-registered investment adviser. Each mutual fund share represents an investor's proportionate ownership of the mutual fund's portfolio and the income the portfolio generates. (Pradeep panda, May 2017)

RESEARCH DESIGN

METHODOLOGY

Following the existing literature (Sirucek, Martin Vystoupil, Jan Strejcek, Petr,2018; Mahesh, Geethanjali, Dr Lokesh, Dr Srinivasan, Sriram,2023; Bano, Yasmeen Shanmugam, Vasantha 2017) and with help of (Rompotis, Gerasimos Georgiou ,2007).

OBJECTIVE OF THE STUDY

- To examine risk-adjusted return and compare the performance of selected categories of ETFs to benchmark index.
- To evaluate the performance of equity mutual fund scheme and understand the impact of benchmark index on risk and return basis.

DATA USED

The current analysis is based on secondary data from mutual fund and ETFs schemes, the Nifty 50 index, and a 10-year government bond (a risk-free asset). This study compared these schemes to the market by focusing on their risk and return aspects. To examine the performance of these mutual fund schemes, several financial methods such as Beta, Standard deviation, Sharpe ratio, Treynor ratio, and Jensen's Alpha were applied. There will be 54 ETFs and 55 mutual funds to evaluate the performance with benchmark index.

The data that is selected with below criteria:

- The ETFs are total 54 funds excluding the commodities and debt ETFs. The funds that are considered are those the data is available for 3 years of return. The mutual fund is all open ended small, mid cap and large cap sample of 55.

TOOLS USED

The present study employed a range of methodologies and resources including the usage of SPSS software, official websites, and reports of the NSE, money control, Yahoo Finance, the Association of Mutual Fund in India (AMFI), and other sources.

Following are the concepts to be used in the analysis of the ETFs and Mutual Funds schemes:

Jensen's alpha

Jensen's alpha is a risk-adjusted performance measure that represents the average return on a portfolio or investment, above or below that predicted by the capital asset pricing model (CAPM), given the portfolio's or investment's beta and the average market return. Under the ratio, R_f is the average of 10-year government bond yield whereas the R is taken as the recent return from the funds for the annual period.

$$\alpha = R_p - \{R_f + \beta (R_m - R_f)\}$$

Where:

- R = The returns generated by the portfolio
- R_f = The risk-free rate
- B = The portfolio's beta
- R_m = The expected market return

Sharpe Ratio

It assesses the fund's performance in relation to the risk it takes. It is defined as the excess return above the risk-free rate divided by the fund's standard deviation. A greater Sharpe Ratio indicates that the fund fared better in relation to the risk it took. If the Sharpe Ratio is negative, it suggests that a risk-free asset would outperform the security under evaluation. Under the ratio, R_f is the average of 10-year government bond yield whereas the R is taken as the recent return from the funds for the annual period.

$$\text{Sharpe ratio} = \frac{R_i - R_f}{\sigma_i}$$

Treynor's Ratio

It is defined as a fund's excess return over and above the risk-free return. A greater Treynor Ratio indicates that the fund has done better in relation to the risk it has taken. Under the ratio, R_f is the average of 10-year government bond yield whereas the R is taken as the recent return from the funds for the annual period.

$$\text{Treynor's ratio} = \frac{R_i - R_f}{\beta_i}$$

EMPIRICAL RESULT AND DISCUSSION**ETFs ANALYSIS**

To analyse the data, we should compare the ratios of benchmark index and ETFs. for the given paired sample t-test results you provided, where differences are calculated for each pair, the hypotheses would be formulated as follows:

Null Hypothesis (H0): There is no significant difference between the paired observations (e.g., no difference in beta, Sharpe, Jensen, Treynor).

Alternative Hypothesis (H1): There is a significant difference between the paired observations.

When to accept or reject hypothesis:

- If the p-value obtained from the statistical test is less than or equal to the chosen alpha level (e.g., $p \leq 0.05$), you reject the null hypothesis.
- If the p-value obtained is greater than the chosen alpha level (e.g., $p > 0.05$), you fail to reject the null hypothesis.

Paired Samples Test									
		Paired Differences					df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	beta - beta	-0.03426	0.15043	0.02047	-0.07532	0.00680	-1.674	53	0.100
Pair 2	Sharpe - Sharpe	-0.17759	0.50935	0.06931	-0.31662	-0.03857	-2.562	53	0.013
Pair 3	Jenson - Jenson	-0.38963	5.13254	0.69845	-1.79054	1.01128	-0.558	53	0.579
Pair 4	Treynor - Treynor	0.05019	0.62099	0.08451	-0.11931	0.21968	0.594	53	0.555

<u>OBSERVATION</u>	<u>HYPOTHESIS</u>
BETA	Accept
SHARPE RATIO	Reject
JENSON ALPHA	Accept
TREYNOR RATIO	Accept

DESCRIPTIVE STATISTICS

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
beta	54	0.01	1.00	0.9172	0.24405	-3.063	0.325	8.312	0.639
Sharpe	54	-1.25	1.66	0.4830	0.64247	-1.398	0.325	2.040	0.639
Jenson	54	-33.96	9.03	-0.7233	4.99851	-5.489	0.325	38.715	0.639
Treynor	54	-2.67	0.93	0.0369	0.45355	-4.662	0.325	26.279	0.639
Valid N (listwise)	54								

The ETF's beta value is close to 1, indicating a similar risk to the market. The Sharpe Ratio is 0.4830, indicating risk-adjusted return. Jensen's alpha measures excess return over expected return, with an average of -0.7233. The Treynor ratio measures excess return per unit of systematic risk, with a skewness of -4.662..

MUTUAL FUNDS ANALYSIS

For the given paired sample t-test results you provided, where differences are calculated for each pair, the hypotheses would be formulated as follows:

Null Hypothesis (H₀): There is no significant difference between the paired observations (e.g., no difference in beta, Sharpe, Jensen, Treynor).

Alternative Hypothesis (H₁): There is a significant difference between the paired observations.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	beta - beta	-0.03426	0.15043	0.02047	-0.07532	0.00680	-1.674	53	0.100
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<u>OBSERVATION</u>	<u>HYPOTHESIS</u>
BETA	Accept
SHARPE RATIO	Reject
JENSON ALPHA	Accept
TREYNOR RATIO	Accept

DESCRIPTIVE STATISTICS

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Sharpe Ratio	55	0.29	1.80	1.1758	0.37891	-0.356	0.322	-0.840	0.634
Jensen's Alpha	55	-7.17	7.39	0.9785	3.76135	-0.214	0.322	-0.774	0.634
Treynor's Ratio	55	0.04	0.33	0.2058	0.07838	-0.176	0.322	-1.061	0.634
Valid N	55								

The investment's Sharpe Ratio is 1.1758, Jensen's Alpha of 0.9785 and Treynor's Ratio of 0.2058 indicating a positive risk-adjusted return. The distribution is slightly left-skewed, with a negative skewness and a slight platykurtic kurtosis, suggesting outliers with lower ratios.

CONCLUSION

Using a paired samples t-test, the study examines important financial indicators with an emphasis on Treynor Ratio, Jensen's Alpha, Beta, and Sharpe Ratio at two distinct moments in time. There are no discernible variations between Jensen's Alpha and Beta according to the research, indicating stability. But there is a noticeable movement in the Sharpe Ratio, which suggests a change in risk-adjusted returns. The Treynor Ratio indicates a consistent excess return per unit of systematic risk, in line with Jensen's Alpha and Beta. The report offers a thorough analysis of Exchange Traded Funds' (ETFs) risk, return, and performance characteristics as well as a sophisticated grasp of their financial metrics. The mutual fund analysis part assesses the performance of funds in relation to their relevant market indexes, which further increases the research's significance. The study accepts traditional presumptions.

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