Mutual Fund Performance Evaluation: A Comparison of Index Mutual Funds Returns and Its Benchmark Returns

Abstract :

The author's main goal is to evaluate the performance of selected mutual funds against its index returns or benchmark returns. The researcher has use R- Square technique to establish relationship of mutual funds. Finally, he finds statistically measured normal or abnormal performance using its concerned benchmark. As all the indexed mutual fund's performance largely depends on the functionality of benchmark, the researcher intended to assess the impact of benchmark on all selected mutual fund schemes.

Key Words: Mutual funds, performance, mutual fund return, benchmark returns.

Introduction

Index funds are arguably one of the most successful ideas that have flowed from academic economics into the real world. Indexing is based on the premise that if markets are fairly efficient, then it would prove difficult for active managers to obtain excess returns, after considering the higher fees and costs that they have to run up. Hence, instead of actively engaging in stock picking, index funds simply try to replicate the returns on a chosen market index and aim to deliver the returns and the risk of that index. Evaluating an index fund's performance boils down to observing how closely a fund tracks the underlying index.

Index funds incur transactions costs that are associated with portfolio implementation, re-balancing and capital flows. When the composition of the underlying index changes, either due to additions or deletions of constituents or due to corporate restructuring, the index assumes that the theoretical portfolio's new weights to each security can be achieved automatically. However, for the index fund, realigning the portfolio to mimic the underlying benchmarks involves physical trading in stock and the transactions costs incurred thereby.

2. Literature Review:

No.	Details	Descriptions
1	**Title**	A Comparison Between Large and Small Independent Fund Companies' Sweden Funds
	Type of Area	Master's thesis within Corporate Finance
	Year	2011
	Institute/Place	Jonkoping International Business School, Jonkoping University
	Researcher/Author	Anna Svensson, Gustaf Jademyr
	Guide	Andreas Stephan, Jan Weiss
	Review	The result of this thesis shows that the differences regarding performance and fund management is small. However, through a statistical test of 18 Sweden funds, the

		authors concluded there are differences between the two types concerning the accumulated return and Jensen's alpha. Small independent fund companies' Sweden fund showed better result. Moreover, regarding the fund management, it is possible to see a trend that the small independent fund companies' Sweden funds are actively managed in a higher degree than the banks. This is due to the result that the turnover ratio and tracking error showing higher figures for the small independent companies' Sweden funds. Further, concerning the organizational structure, there are some obvious differences. The banks' fund companies have longer experience within the branch and have a larger variety of funds. Moreover, they consist of larger teams and department within the organization.
2	**Title**	Mutual Fund Performance Evaluation
	Type of Area	Bachelor's thesis
	Year	2012
	Institute/Place	Lappeenranta Universtiy of Technology, School of Business.
	Researcher/Author	Tanja Traff
	Guide	Eero Patari
	Review	This study investigates approximately 400 mutual funds in Finland, with 60 billion euros in assets, and at the end of August 2012 the amount had increased, according to Federation of Finnish Financial Services (2012). The majority of these assets lie under actively managed funds. Although the active management offers number of services, such as check-writing and book-keeping services, more than half of the expenses of mutual funds arise from their stock selection ability and their ability to time the market. This thesis is a literature review concentrating on academic literature that has investigated the ability of the mutual fund manager to time the market. Market timing in this context is referring to the ability of a fund manager to take on more exposure to the market before it goes up and to pull out of the market before it goes down. Asset allocation is a relatively known term for market timing and is used in this thesis when referring to literature that has used that term for market timing.
3	**Title**	Essays on Financial Performance Measurement
	Type of Area	Ph.D
	Year	2010
	Institute/Place	Graduate School of Business and Administration, Economics, Law and Social Sciences (HSG), Barlin
	Researcher/Author	Roger Faust
	Guide	Prof. Dr. Hato Schmeiser Prof. Dr. Manuel Ammann
4	**Title**	Factors Influencing Unit Trust Performance Trust Performance
	Type of Area	Ph.D
	Year	2006
	Institute/Place	Graduate College of Management, Southern Cross University
	Researcher/Author	Tng Cheong Sing
	Guide	Dr. Geoffrey Meredith
	Review	The aim this research is to assess that Bank-managed equity funds are not inferior to their non-bank counterparts. Previous research reporting relative underperformance of bank-managed funds ignored their differing fiduciary standards. To evaluate bank and non-bank funds facing similar fiduciary responsibilities, domestic retail funds approved for Singapore's Central Provident Fund Investment Scheme were examined, as they meet the same standard for managing social security savings. Returns from these funds correlate highly with market performance. Even though these fund returns exceeded guaranteed interest rates, they did not outperform their market index.

5	Title	Evaluation Of Mutual Funds Using Multi-Dimensional Information
	Type of Area	Research Article
	Yearv	2010
	Institute/Place	Frontiers of Computer Science in China
	Researcher/Author	Xiujuan Zhao
	Review	To make better use of mutual fund information for decision-making the researcher propose a coned-context, data envelopment analysis (DEA) model with expected shortfall under an asymmetric Laplace distribution in order to measure risk when evaluating performance of mutual funds. Unlike traditional models, this model not only measures the attractiveness of mutual funds relative to the performance of other funds, but also takes the decision makers' preferences and expert knowledge/judgment into full consideration.

3. Motivation for the Study:

A large number of performance evaluation studies have been undertaken for actively managed funds (Elton et al. 1993, Malkiel 1995, Gruber 1996, Elton et al. 1996, Carhart 1997). However, despite the significant growth in the value of assets being indexed across the world, empirical research evaluating the performance of index funds is scarce. Frino & Gallagher (1999) examine the performance of passive equity fund managers in Australia. Frino & Gallagher (2001) evaluate the extent of S&P index fund tracking error and compare active fund and index fund performance. In this paper, the researcher examines the relationship between the index funds and returns of stock market, resulting due to volatility.

4. Objective of the Research:

1. The objective of this research paper is to explore and establish the relationship among selected index mutual funds and performance of stock markets in India.
2. To evaluate the individual performance of selected mutual funds against its index returns.
3. To explore the degree of volatility during the year 2011 to 2013

5. Significance Of The Study:

1. As this research work establishes the relationships among selected mutual fund schemes and performance of stock market or index returns, the investor can take appropriate decision for further investments in mutual funds industries.
2. An investor can predict the trends of performance in mutual funds.
3. The exploration of some technical issues which are highly concerned with the performance of mutual funds will enable the viewers or investors with more insights for investment.

6. Research Methodology:

6.1 Data Collection Sources and Criteria

To justify the objectives of the research, the researcher has collected the data using secondary sources. The researcher has used value research online website with is one most reputed and famous research agency which provides rates to all the mutual fund schemes. Only the five star rated schemes of mutual fund have been undertaken from valueresearchonline.com.

6.2 Data Analysis Tool and Techniques:

The researcher has used Beta and R-Square technique, to measure the performance of mutual funds. With the help of these techniques, the researcher will analysed the data to derive the scientific results from available variables.

6.2.1 Formula for Beta:

$$\beta = \frac{\text{Covariance of Market Return with Stock Return}}{\text{Variance of Market Return}}$$

6.2.1 Formula for R-Square:

$$r - Rf = beta \times (Km - Rf) + alpha$$

Where r is the fund's return rate, Rf is the risk-free return rate, and Km is the return of the index.

6.3 Research Period:

The percentage of returns from the year 2011 to 2013 of selected mutual fund scheme is been undertaken for the research work.

7. Data Analysis and Interpretation:

7.1. Performance Evaluation of Mutual Fund Returns against its Beta (Table No. 1: Establishment of relationship of mutual funds' returns and benchmark through Beta)

No.	Mutual Funds	Benchmark	2011 Returns	2012 Returns	2013 Returns	Beta
1	HDFC Index Fund - Sensex Plan	S&P BSE Sensex	-25.30	26.00	9.20	1.0246
2	Reliance Index Fund - Nifty Plan (G)	CNX Nifty	-24.30	28.70	6.30	1.0853
3	UTI Nifty Index Fund (G)	CNX Nifty	-25.10	28.00	6.00	1.0889
4	Goldman Sachs Nifty Exchange Traded Scheme	CNX Nifty	-24.20	26.60	5.80	1.0426
5	Kotak Nifty ETF	CNX Nifty	-24.30	28.80	5.2	1.0833
6	SBI Magnum Index Fund (G)	CNX Nifty	-24.90	28.10	5.40	1.0871
7	IDBI Nifty Index Fund (G)	CNX Nifty	-25.20	27.40	6.30	1.0838

1. Beta takes into account the magnitude of the fund's movement relative to the benchmark. A measurement of 1 translates into the fund being exactly as volatile as its benchmark. A beta of less than 1 implies that the fund is that much less volatile than its benchmark, and vice versa. For example, if a fund has a beta of 1.1 in relation to its concerned index, then the fund historically has been 10% more volatile than the index. So from the above presented table, the researcher can prove that movement of the return is generally in the same direction as compared to its index,but more than the movement of the index. All the selected index mutual funds are performing better than its index performance. The beta analysis indicates that UTI Nifty Index Fund (G) is the most volatile mutual fund among all selected schemes of mutual as its beta is measured as 1.0889, which the highest beta.

7.2. Establishment of Relation of Mutual Fund Returns and its Benchmark Returns Through Co-efficient of Determination (R–Squared) Technique:
(Table No. 2: Establishment of relationship of mutual funds' returns and benchmark through R-Squared)

No.	Mutual Funds	R-Squared 2011-13M
1	HDFC Index Fund - Sensex Plan	0.9999
2	Reliance Index Fund - Nifty Plan (G)	0.9964
3	UTI Nifty Index Fund (G)	0.9974
4	Goldman Sachs Nifty Exchange Traded Scheme	0.9980
5	Kotak Nifty ETF	0.9928
6	SBI Magnum Index Fund (G)	0.9956
7	IDBI Nifty Index Fund (G)	0.9987

Before a fund comparison can be made, it is necessary to identify each fund's relevant benchmark. The first step is to calculate and observe it's *R-Squared*. The *R-Squared*, measured from 0 to 1, determines the percentage of the fund's *movement* that is explained by an index/benchmark. It has been referred to as "the goodness of fit." The higher the *R-Squared* (closer to 1), the more relevant

the fund is to its benchmark. An R-Squared of 0 indicates no correlation between the fund and the benchmark; an R-Squared of 1 indicates a full correlation to its benchmark. The R-Square determines whether the benchmark used for performance evaluation represents a true apples-to-apples comparison. A high R-squared (between 0.85 and 1) indicates the fund's performance patterns have been in line with the index. A fund with a low R-squared (0.70 or less) doesn't act much like the index.

A higher R-squared value will indicate a more useful beta figure. For example, if a fund has an R-squared value of close to 1 but has a beta below 1, it is most likely offering higher risk-adjusted returns. A low R-squared indicates that the investor should ignore the beta. For all the selected mutual fund scheme, R-Square value is near to 1 which portraits that the theory that performance of any scheme is highly concerned with its benchmarks' performance or returns.

7.3. t-Test for comparing means and variance of Mutual Fund Returns and Benchmark Returns.

No.	Mutual Funds	t-Calculated Value	t-Critical Value
1	HDFC Index Fund - Sensex Plan	1.28	4.30
2	Reliance Index Fund - Nifty Plan (G)	1.76	4.30
3	UTI Nifty Index Fund (G)	1.40	4.30
4	Goldman Sachs Nifty Exchange Traded Scheme	2.05	4.30
5	Kotak Nifty ETF	1.33	4.30
6	SBI Magnum Index Fund (G)	1.25	4.30
7	IDBI Nifty Index Fund (G)	1.52	4.30

H_0: There is no significant difference between the means of mutual fund scheme and its benchmark returns.

For all selected mutual fund schemes, the null hypothesis is accepted as t-calculated value is lower than t-critical value. The acceptance of null hypothesis proves that all the selected mutual fund schemes are performing and following the market movements. All the selected mutual schemes have positive trend towards its benchmark index. This statistical analysis enables the researcher to prove the acceptance of mutual fund theories that the performance of mutual fund schemes is dependent on its concerned benchmarks.

8. Findings:

1. The beta analysis indicates that UTI Nifty Index Fund (G) is the most volatile mutual fund among all selected schemes of mutual as its beta is measured as 1.0889, which the highest beta. HDFC Index Fund - Sensex Plan has least beta which is measured as 1.0246, producing least volatile returns against its benchmark.
2. The Co-efficient of Determination (R-Squared) proves that HDFC Index Fund - Sensex Plan has almost perfect correlation with its benchmark returns. The value of R-Squared is measure as 0.9999 which is almost positive and perfect relation with its benchmark returns. Whereas for Kotak Nifty ETF, the R-Squared was measured as 0.9928 which is the least value among all the selected mutual funds.
3. The proved hypothesis reveals the less degree of volatility between the mean value of mutual fund and its benchmark returns. The performance of Index Mutual Fund is almost parallel against its benchmark/index returns.
4. The acceptance of the hypothesis assists the theory of Index Mutual Fund and proves that these mutual funds are highly sensitive with their benchmark returns. These mutual funds are actually producing their returns from the benchmark's volatility.

9. Conclusion:

All the selected Index Mutual Fund schemes are highly sensitive with their respective benchmark performance as the functioning of the mutual funds are highly concerned with its indices. As all the selected mutual funds schemes are index schemes, the performance of these schemes sharply depends on its concerned benchmark performance. The statistical tool like R-Squared and test of

hypothesises have established close relationships between returns of schemes and benchmark returns. Beta represents the sensitivity of performance of mutual fund schemes and benchmark. This research work assists the theories of Index Mutual Funds' functioning.

References :

Books/Research Papers/Thesis

1. Anna Svensson, Gustaf Jademyr, "A Comparison Between Large and Small Independent Fund Companies' Sweden Funds", 2011, Jonkoping International Business School, Jonkoping University
2. Tanja Traff , Mutual Fund Performance Evaluation, 2012, Lappeenranta Universtiy of Technology, School of Business
3. Roger Faust, Essays on Financial Performance Measurement, 2010, Graduate School of Business and Administration, Economics, Law and Social Sciences (HSG), Barlin
4. Tng Cheong Sing, Factors Influencing Unit Trust Performance Trust Performance, 2006, Graduate College of Management, Southern Cross University.
5. Xiujuan Zhao, Evaluation Of Mutual Funds Using Multi-Dimensional Information, 2010, Frontiers of Computer Science in China.

****

Krunal J Purohit
Assistant Professor,
Lt. M.J. Kundaliya Commerce and BBA English Medium College,
Rajkot