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AN EMPIRICAL STUDY ON MARKET TIMING AND SELECTIVITY SKILLS OF INDIAN MUTUAL FUND MANAGERS USING TREYNOR AND MAZUY MODEL

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Abstract:

The importance of mutual funds in financial markets has literally sky-rocketed over the past fifteen years worldwide. This phenomenon can be attributed to the unique benefits that mutual funds offer to individual. Due to widely documented trend, the performance of portfolio managers has become an increasingly important issue among financial analysts. From a social perspective, it is important to know whether the professional mutual fund managers add value to the portfolios they manage. His paper is an empirical assessment of the performance of mutual fund managers in terms of "market timing" and "selectivity", within the framework suggested by Treynor and Mazuy (1966). The contribution of this paper is twofold. First, it concentrates on all mutual funds from five asset management companies to check if they prove the contribution of the fund managers for better performance. Second, in the implementation of its non-traditional performance measure, it employed daily fund returns, stock market indices as opposed to the monthly or quarterly data used in other related studies. The results, expectedly, have indicated a lack of market timing abilities of selected funds.

Index Terms: Treynor-Mazuy, Market Timing, Stock Selection, Mutual Funds & Performance Evaluation

1. Introduction:

The importance of mutual funds in financial markets has literally sky-rocketed over the past fifteen years worldwide. This phenomenon can be attributed to the unique benefits that mutual funds offer to individual. Due to widely documented trend, the performance of portfolio managers has become an increasingly important issue among financial analysts. From a social perspective, it is important to know whether the professional mutual fund managers add value to the portfolios they manage or whether they merely create excessive transaction costs through their active management. At the micro level it is important to know how to identify a portfolio manager with the ability to add value to the portfolio he manages.

This study has a unique value which concentrates on whether there is existence of stock selection skills and the market timing ability. It is used to indicate the ability of investment managers in Indian mutual fund industry which is associated with their performance.

Stock Selection: The ability of investment managers in selecting the right stocks in the portfolio can be demonstrated by the ability of stock selection. There are several methods in selecting the stocks in the portfolio composition. One common method is to choose stocks that on average provide performance that is "safe". The performance of some of these stocks can make the overall performance high even in the bad economic conditions. The method for measuring the Stock Selection is taking into account the level of performance which is compared to the performance of the market and the risk-free performance and beta. Treynor and Mazuy (1966) tried to use the model and described ability of investment managers in selecting the right stocks.

Market Timing: It can be described in the investment manager's ability to enter the market at the right time. Positive values describe the ability of a manager to time the market for superior performance.

According to the model, the value of α, i.e. positive alpha means that there is the selectivity ability and the value of β, i.e positive market timing means indicates the ability of market timing. If found then it indicates that the investment managers generate excess portfolio performance for mutual funds which is greater than the excess performance of the market.

2. The Indian Mutual Funds Industry:

An increase in GDP as well as good stock market performance over the last two – three years provided investors and especially retail investors with an opportunity to use mutual funds to create wealth. The shift in preference from traditional savings channels to mutual funds and other assets has been made possible due to the awareness building exercises undertaken by the AMCs, demographic shift in customer base as well as availability of products that match the needs of the customers. This has been accentuated by the roll-out and subsequent customer adoption of initiatives that leveraged technology and the interplay amongst all these factors helped in the growth of the industry.

The Indian mutual fund (MF) industry witnessed an addition of around 2.2 million new investors during 2014-15. The total number of investors stood at 4.17 crore at the end of the 12-month period in March 2015 as compared to 3.95 crore at the end of March 2014 registering a growth of 5.54 per cent.

3. Objectives of the Study:

- ✓ To study the performance of the Indian mutual funds using Treynor and Jensen's measure.
- ✓ To study whether the Indian fund managers possess market timing and stock selection skills in managing the mutual funds.

4. Literature Review:

Majority of the studies for mutual funds performance have employed a method developed by Jensen (1968, 1969) and later refined by Black, Jensen and Scholes (1972). These methods compare fund's performance with that of a benchmark index. However these approaches are subject to certain limitations. Firstly they are based on the assumption that the risk level of the portfolio under consideration is stationary through time and secondly they fail to separate the ability of the managers in terms of market timing and selectivity. According to Fama (1972) the performance of a fund manager can be attributed to both market timing ability (ability of managers to forecast changes in the macroeconomic environment in order to change the portfolio beta and maximize its future return) and security selection ability (ability of managers to select undervalued assets). Chua and Woodward (1986) carried out the same test for Canadian, US and UK funds for the period 1973 – 1983 and found that the poor market timing performance of the mutual funds. Chang and Lewellen (1984) using the Henriksson – Merton model examined monthly returns of 67 mutual funds during the period January 1971 - December 1979 and did not find evidence on positive market timing. The conclusions include the following: Fund managers fail to provide evidence of statistically significant market timing skills of fund managers.

5. Methodology:

Jensen (1968, 1969) formulated a return-generated model to measure performance of managed portfolios which is based on the CAPM model.

$$R_{pt} = \alpha_p + \beta_p R_{mt} + u_{pt} \quad \text{.....} \quad (1)$$

where R_{pt} is the excess return (net of the risk free rate) of the pth portfolio, R_{mt} is the excess return (net of the risk free rate) of the market portfolio, α_p is a measure of security selection ability, β_p is the beta coefficient of the portfolio p, u_{pt} is a random error which has expected value of zero and constant variance and t denotes time. This specification assumes that the risk level of the portfolio under consideration is stationary through time and ignores the market timing skills of the managers.

Several methods have been proposed in the literature for the evaluation of the selectivity and timing abilities of portfolio managers, using only the observed time series of realized returns on the managed portfolios. It was criticized by many researchers as it was only market risk factor affecting the portfolio return which is kept stationary ignoring the changing market conditions. So, Treynor and Mazuy added a quadratic term to equation (1) to test for market timing skill with an argument that if a manager can forecast market returns, he will hold a greater proportion of the market portfolio when the return of the market is high and a smaller proportion when the return is low. Thus, the portfolio return will be a nonlinear function of the market return as follows:

$$R_{pt}-R_{ft} = \alpha_p + \beta_p (R_{mt}-R_{ft}) + \gamma_p (R_{mt}-R_{ft})^2 + \epsilon_{pt} \quad \text.....\quad (2)$$

If α_p is positive, it means that the investment manager is able to establish an optimal portfolio, and otherwise if α_p is negative, it means the investment manager is not able to establish an optimal portfolio. The value γ reflects market timing abilities that demonstrate the ability of investment managers to make adjustments to the asset portfolio for anticipate changes market price movements in general. If γ_p is positive and significant, it indicates that the investment manager has the ability to market timing. Likewise, if γ_p is negative and significant, it indicates that the investment manager does not have the ability to market timing.

The hypothesis to be tested and the anticipated results for the majority of mutual funds, are provided in Table 1.

Table 1

Hypothesis	Anticipated Results
Treynor-Mazuy Model	
$\alpha_p = 0$	reject
$\gamma_p = 0$	accept

Since the growth of mutual funds is largely concentrated around the top five asset management companies (AMCs) – HDFC Mutual Fund, ICICI Prudential, Birla Sun Life, Reliance MF and UTI MF.(Source: India Brand Equity Foundation (IBEF)), the schemes from all the mutual fund categories is selected from these top five asset management companies for the study. The study period for five years from 2010 to 2015 which includes the time series of daily returns of all the mutual fund schemes.

The market portfolio is measured by the Nifty 50 Index of the National Stock Exchange. In order to measure the risk free rate three-month Treasury bill rates have been used. The statistical tools are used to calculate beta, correlation for the study. Using Microsoft excel, alpha, average returns, standard deviation and excess returns over benchmark and risk free rates are calculated.

6. Empirical Application:

Daily returns for all mutual funds are examined. To be included, each fund must have existed throughout the period from January 2011 through December 2015. The market portfolio is measured by the Nifty 50 Index of the National Stock Exchange. In order to measure the risk free rate three-month Treasury bill rates have been used.

Before examining the market timing and selectivity abilities of mutual fund managers we consider their performance in terms of average returns, both unadjusted as well as risk adjusted.

Table 2: Showing performance of all the schemes on an average under the selected mutual funds for the period 2011-2015

AMCs	Avg	S D	Beta	Corr	Tn	Alpha
Birla Sun life	0.06	0.47	4.46	0.12	0.01	0.10
HDFC	0.40	0.71	-2.75	-0.22	-0.65	0.80
ICICI Prudential	0.29	1.17	-6.99	-0.09	-0.93	1.40
Reliance	0.07	0.55	-7.53	-0.11	0.03	0.12
UTI	0.47	1.48	-0.83	0.25	-0.63	0.58

The above table speaks only of those funds which have performed better over the five years when their performance measure are considered along with their average returns.

Table 3

Summary results from the Treynor-Mazuy model for the period 2011-2015

$$R_{pt}-R_{ft} = \alpha_p + \beta_p (R_{mt}-R_{ft}) + \gamma_p (R_{mt}-R_{ft})^2 + \epsilon_{pt}$$

Parameter	Positive	Negative	Statistically significant		Statistically insignificant	
			Positive	Negative	Positive	Negative
α_p	199	114	62	5	137	67
β_p	194	77	-	-	194	77
γ_p	170	101	12	7	158	94

α_p: Selectivity measure

β_p : Beta

γ_p: Market Timing measure

If we consider risk – adjusted returns (Jensen's measure), it turns out that only few funds could seriously claim above – average performance. The benchmark portfolio is approximated by the Nifty 50 Index and the risk free rates are given by three month treasury bill rates. From the analysis, it is found that, pertaining to the model of Treynor - Mazuy, out of 271 schemes from 5 AMCs, only 62 fund managers had exhibited statistically significant positive selectivity coefficient, although around 199 schemes showed positive coefficients. In five cases (four in Birla Sun Life and one in ICICI Prudential), the coefficient was significantly negative. As far as the market timing coefficient is concerned, coefficient is found positive in around 170 cases but only 12 of them are found to be statistically significant.

The hypothesis is tested using chi-square to measure the statistical significance of the selectivity and timing coefficients which is got through the regression analysis using the Treynor Mazuy model. The coefficient and their p value is taken and tested using chi-square test. If they are statistically significant then the skills are found among the fund managers. The coefficients are tested separately.

Selectivity coefficient(α_p)	Positive	Negative	Marginal Row Totals
significant	62 (49.2) [3.33]	5 (17.8) [9.21]	67
insignificant	137 (149.8) [1.09]	67 (54.2) [3.02]	204
Marginal Column Totals	199	72	271 (Grand Total)

Table 4 showing significance of selectivity coefficient

The Chi square statistic is 16.6258 and the p-value is 0.000045. Thus, the selectivity coefficient is significant at 5% level of significance.

Timing coefficient (γ)	positive	negative	*Marginal Row Totals*
significant	12 (11.92) [0]	7 (7.08) [0]	19
insignificant	158 (158.08) [0]	94 (93.92) [0]	252
Marginal Column Totals	170	101	271 (Grand Total)

Table 5 showing significance of Timing coefficient

The chi square statistic is 0.0016. The p-value is 0.968138. This result is not significant at $p < 0.05$. The above table shows that there is no significant market timing although there is evidence for significant stock selection skills among the fund managers of various schemes of AMCs. Thus the hypothesis framed shows insignificant market timing and stock selection for majority of the funds. To conclude, significant timing and selectivity abilities is not found among most mutual fund managers.

7. Implications for Theory and Practice:

The empirical findings do not reveal any general ability of the fund managers to time the market correctly. Few traces found helps the investors to know the best funds to be invested. It helps the fund managers to concentrate more on their funds to enhance their stock selection and market timing skills.

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