
Do Mutual Funds Persist the Performance : Good or Bad?

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Abstract

This research makes an attempt to determine persistence in the mutual fund returns. i.e. an effort has been made to determine the presence or absence of the ability of the mutual fund managers to select the right type of stock at the right time. The study utilizes a few selected techniques of performance evaluation on the sample of 36 equity diversified schemes of Indian mutual fund houses. The period of the study is from January 2001 till December 2014. The benchmark used for the study is S&P CNX NIFTY. Grinblatt and Titman's persistence methodology is used by dividing the sample tenure of one hundred and sixty-eight months in two equal halves. The regression incorporating the alpha values generated by the Jensen's Alpha model and beta values generated by Treynor-Mazuy as well as Merton-Henriksson model is run. The Jensen's model, Treynor-Mazuy and Merton-Henriksson models do not give statistically significant evidence of persistence in stock selection ability which is evident from t-statistics value of 0.13923424, -0.342969074 and 0.76215211 respectively of alphas of the models at 5 per cent level of significance. The results of all the models are in sync with each other as well as the previous studies. The empirical results of Treynor-Mazuy and Merton-Henriksson models show no persistence in timing ability of the fund managers. The conclusion has come from t-statistics values of -0.725882517, -1.221886878 of beta of Treynor-Mazuy and Merton-Henriksson models respectively which is not significant at 5 per cent level of significance. But by expanding the level of significance to 10 per cent, the persistence in perverse market timing of the fund managers gets focused on. The findings of the study are consistent with existing studies done in emerging as well as the mature markets. Overall the evidence is in conformity with the efficient market hypothesis. In this study, the evaluation of persistence in fund performance has been studied not only owing to selectivity skills but also market timing. The results have implications for hedge funds and other managed portfolios that consistently follow "fund of funds" strategy in pursuit of extra-normal returns.

Keywords : Equity Mutual Funds, Persistence, Stock-selection Ability, Timing-ability, Fund Performance

1.0 Introduction

Mutual funds always put a lot of emphasis on their past performance while placing an advertisement. Various researchers have found that the primary determinant of flows of money into a particular fund is past performance of the mutual fund relative to that of similar funds. Generally, investors act as though past performance matters. Thus, an important issue for mutual fund investors is whether a mutual fund's past performance provides any indication of its likely future performance. Is it rational for investors to chase past returns? Do investors select likely top mutual funds by basing the

selections on returns history? Put differently, do the funds persist the performance, good or bad? Small investors depend heavily on mutual funds for channelizing their savings. Mutual funds hold a major role in the financial markets as well. The size of the industry too is significant. Given these implications, the comprehensive evaluation of the fund schemes becomes very vital. The evaluation of performance will verify if some managers have better sense of selecting the right stock at the right time. And if at all the sense of picking right stock at right time exists, does the same ability persist too? Mutual funds

are the sample for acceptance or rejection of market efficiency in the strong form. Hence, the academic literature will be strengthened in the area of market efficiency too.

The objective of this research work is to conclude empirically if such managerial ability persists over a time horizon. The study specifically examines the following proposition. Do the Indian mutual fund managers persist the performance (good or bad) in selecting the right stock at the right time?

The study enriches the literature by validating the presence or absence of persistence in mutual funds' performance for India, an emerging market setting. The out of sample test enriches the literature as most of the previous work relate to mature markets.

The persistence in mutual fund performance was examined by Grinblatt and Titman in 1992 using eight portfolios (P8) as benchmark. This benchmark was devised by Grinblatt in the year 1989. They used abnormal performance or Jensen Index as basic measure of performance. They applied this method on 279 mutual funds for the ten years' time frame, from 1974 to 1984. According to the authors, this was the largest sample of mutual funds evaluated in the literature upto that time. "Winner repeats?" In search of the answer of this question Goetzman and Ibbotson examined 728 stock mutual funds during the years 1976-1988. They found strong evidence of persistence in performance while using either raw or market risk-adjusted returns as measure of performance. They conclude "past returns and relative rankings" are useful in predicting returns and rankings". Brown and Goetzman evaluated persistence in year-to-year mutual fund performance for the period from 1976 to 1988. They found evidence of significant persistence regardless of the measure of performance. They conclude that "the strongest evidence for repeat performance is over the late 1970s and early 1980s". This finding is in line with Goetzman and Ibbotson. Alekhya in the year 2012 studied performance evaluation of public and private sector mutual funds in India for a period of three years to appraise the performance of mutual funds with risk adjustments. An attempt to analyze performance of growth-oriented equity diversified schemes was made by Poornima and Sudhamati in 2013. The study supports careful evaluation for selection of best funds by investors. Morgan Stanley report on sustainable investing in mutual funds in 2015 reviewed a range of studies on sustainable investment. It concluded that equity mutual funds had higher median returns and lower median volatility compared to traditional counterparts.

2.0 Objective of the Study

The research work aims at examining presence or absence of the ability of the mutual fund managers to select the right type of stock at the right time with special emphasis on equity mutual funds.

2.1 Hypothesis

The study tests the following hypothesis in respect of persistence in the performance evaluation of mutual fund schemes:

- The past winners/losers in the mutual fund industry persist its performance in the future.

3.0 Data and their Sources

3.1 The Sample

A sample of 36 diversified equity funds (Refer Table no. 1) have been used to study their investment performance. The choice of the sample is largely based on the following criteria:

1. The funds should exist on or before January 1st 2001
2. The funds should be existing as on December 31st 2014
3. The funds if merged with other schemes are too considered provided name change history is available
4. The necessary data are available
5. Monthly returns based on net asset values (NAVs) have been used for evaluation

The study has total 168 observations and 6048 data points. Data is collected from moneycontrol.com, bluechip.com and AMFI website. To check the authenticity of the data collected from various sites, the particular period NAVs of particular schemes have been cross-checked and confirmed on all the sites. Table 1 contains the names of the mutual fund schemes along with summary statistics for the test period.

3.2 Fund Returns

With an implicit assumption of one month being the horizon for investment in mutual funds, the study includes monthly adjusted NAV of 36 Indian mutual fund schemes. The continuous compounded returns, $R_{p,t}$ calculation is as under:

$$R_{p,t} = \ln \left[\frac{NAV_{p,t}}{NAV_{p,t-1}} \right]$$

Where $NAV_{p,t}$ is the month-end reported net asset value (NAV) of the mutual fund schemes.

3.3 Duration of Study

The time frame of the study is the recent fourteen-year period from 1st of January 2001 to 31st of December 2014. It is during this period that the Indian markets have seen phases of recession, boom, again recession and recovery (Refer Figure no. 1). The duration of the study is significantly long enough to be taken as the true representative for drawing meaningful conclusions.

3.4 The Benchmark Proxy

The benchmark with which the comparison is made is very important for any study for evaluation. S&P CNX Nifty Index has been used as benchmark in this study. The rationale is its extensive use and active trading.

The index values at the end of the month are considered for market return. The returns are calculated as follows:

Table 1 : Summary Statistics of Funds Return

Sl. No.	Fund Name	Type	Max	Min	Mean	Median	Std. Dev.
1.	Birla Sun Life Advantage Fund	Diversified equity scheme	0.340336	-0.2738	0.014088	0.030887	0.090513
2.	Birla Sun Life MNC	Diversified equity scheme	0.178591	-0.24935	0.014723	0.02665	0.07104
3.	DSPBR Opportunities	Diversified equity scheme	0.393601	-0.28966	0.019596	0.027743	0.100881
4.	Franklin India Blue Chip Fund	Diversified equity scheme	0.231602	-0.25601	0.01906	0.029215	0.08332
5.	Franklin India Prima	Diversified equity scheme	0.637067	-0.31183	0.021927	0.032533	0.111671
6.	Franklin India Prima Plus	Diversified equity scheme	0.263116	-0.25831	0.020046	0.034849	0.081713
7.	HDFC Growth	Diversified equity scheme	0.262904	-0.26611	0.018247	0.025668	0.080707
8.	ICICI Prudential Growth	Diversified equity scheme	0.20397	-0.2612	0.015942	0.028868	0.081532
9.	ICICI Prudential Power	Diversified equity scheme	0.367211	-0.29122	0.018374	0.033815	0.093778
10.	ING Core Equity	Diversified equity scheme	0.267085	-0.50602	0.008016	0.026923	0.115999
11.	JM Equity	Diversified equity scheme	0.328374	-0.35029	0.01224	0.032254	0.10157
12.	Kotak 30	Diversified equity scheme	0.234586	-0.27836	0.016612	0.032681	0.082915
13.	Kotak MNC	Diversified equity scheme	0.252109	-0.22078	0.009247	0.014706	0.082901
14.	LICMF Equity	Diversified equity scheme	0.292475	-0.31268	0.010286	0.02424	0.09614
15.	LICMF Growth	Diversified equity scheme	0.319966	-0.31328	0.01242	0.029436	0.093473
16.	SBI Magnum Contra	Diversified equity scheme	0.291703	-0.30743	0.016886	0.035355	0.097461
17.	SBI Magnum Equity	Diversified equity scheme	0.285495	-0.35329	0.01404	0.031165	0.09507
18.	SBI Magnum Global	Diversified equity scheme	0.618041	-0.37269	0.013939	0.034352	0.119011
19.	SBI Magnum Multiplier Plus	Diversified equity scheme	0.272311	-0.29906	0.014208	0.036786	0.099334
20.	Morgan Stanley Growth	Diversified equity scheme	0.270717	-0.28925	0.012096	0.024009	0.088249
21.	Reliance Growth-Retail	Diversified equity scheme	0.311017	-0.26066	0.026027	0.043027	0.091004
22.	Reliance Vision	Diversified equity scheme	0.287458	-0.24404	0.023702	0.036719	0.087816
23.	Sundaram BNP Paribas Growth	Diversified equity scheme	0.281597	-0.27364	0.017244	0.035064	0.092125
24.	Tata Growth	Diversified equity scheme	0.348831	-0.31346	0.015494	0.020875	0.088085
25.	Tata Pure Equity	Diversified equity scheme	0.283279	-0.26304	0.017952	0.02948	0.087206
26.	Taurus Bonanza	Diversified equity scheme	0.366218	-0.42937	0.012454	0.025999	0.109774
27.	Taurus Discovery	Diversified equity scheme	0.400945	-0.4454	0.005984	0.013096	0.118363
28.	Taurus Starshare	Diversified equity scheme	0.42665	-0.37733	0.015996	0.023318	0.112516
29.	Templeton India Growth	Diversified equity scheme	0.263361	-0.24748	0.019032	0.023988	0.083603
30.	UTI Equity	Diversified equity scheme	0.208705	-0.24387	0.012691	0.020783	0.08626
31.	UTI Master Plus	Diversified equity scheme	0.248173	-0.24915	0.011926	0.019276	0.083767
32.	UTI Master Value	Diversified equity scheme	0.319959	-0.38966	0.008293	0.018308	0.100573
33.	UTI Master Share	Diversified equity scheme	0.205889	-0.21747	0.0098	0.016716	0.080302
34.	UTI MNC	Diversified equity scheme	1.004811	-0.86042	0.012109	0.022931	0.146019
35.	UTI Services Industries	Diversified equity scheme	0.311497	-0.70448	0.008586	0.023224	0.115026
36.	UTI Top 100	Diversified equity scheme	0.261336	-0.25667	0.015753	0.023331	0.085123

Figure 1. Graphical Representation of Market Trend of S & P CNX Nifty



$$R_{m,t} = \ln \left[\frac{P_t}{P_{t-1}} \right]$$

Where P is the value of the index at time t and t-1.

3.5 The Risk-Free Proxy

The study has used the monthly returns on 91-day Treasury Bills (T-bills) as a surrogate for risk-free rate of return.

Enough efforts have been put across to keep the time periods identical for the proxies and the sample observations. Corporate actions have been adjusted in the data reflection to make comparisons unbiased. Moneycontrol.com. is the major source of data for NAV and RBI Bulletin is used widely for Treasury bill rates data.

The T-bill yields reported in annualized form ($R_{af,t}$) is converted into monthly form ($R_{f,t}$) as follows:

$$R_{f,t} = \frac{\ln[1+R_{af,t}]}{12}$$

$R_{af,t}$ is the annualized yield of 91-day Treasury bill reported in RBI website at time t.

4.0 Research Methodology

This section deals with the basic models used in the study and the research methodology employed to achieve the objective of the study.

4.1 Basic Model Used (Capital Asset Pricing Model)

The CAPM is the basic model used throughout the study. According to CAPM, the price of risk is the difference between the expected rate of return on the market portfolio and the risk free rate of return; the quantity of risk, referred as beta (β), is the covariance between returns on the risky asset and the market portfolio divided by the variance of returns on the market portfolio.

In mathematical terms, the CAPM may be expressed as follows:

$$\begin{aligned} E(R_i) &= R_f + [E(R_m) - R_f] \times \left(\frac{\sigma_{im}}{\sigma_m^2} \right) \\ &= R_f + [E(R_m) - R_f] \times \beta_i \end{aligned}$$

Where,

$E(R_i)$ = Expected return on the risky asset

$R(f)$ = Risk-free return

$E(R_m)$ = Expected return on the market portfolio

σ_{im} = Covariance of returns on the risky asset, i, and returns on the market portfolio, m

σ_m^2 = Variance of returns on the market portfolio, m

β_i = Beta of the risky asset

4.2 Model to Measure Persistence in the Stock Selectivity Skills of the Fund Managers

Jensen Differential Return model is used for measuring persistence in the stock selectivity skills of the fund managers. The model is described below:

4.3 Jensen Differential Return Model

Jensen's alpha is the most widely used tool for measuring the excess returns earned by any security or portfolio. The relative riskiness of the asset is taken care of in the CAPM model and hence the returns calculated there are 'risk adjusted'. Higher the risk, higher the return, that's a well-defined norm. Jensen's alpha terms them as 'positive alpha' (when the asset's return is higher than the risk-adjusted return) and 'negative alpha' when it is the opposite. The continuous search of higher alphas is the game.

The requirements for alpha calculation are:

1. The actual returns of the asset
2. The market index returns
3. The risk-free returns
4. The beta of the portfolio

Jensen's alpha = (Portfolio Return - Risk Free Rate) - (Portfolio Beta * (Market Return - Risk Free Rate))

$$\alpha_J = (R_i - R_f) - (\beta_{iM} \cdot (R_M - R_f))$$

Alpha is widely used to evaluate mutual fund and portfolio manager's performance. Hence it becomes important to determine if the fund managers persist in this skill.

4.4 Model to Measure Persistence in the Timing Ability of the Fund Managers

The timing ability is the ability of the fund managers to predict market movements i.e. the manager is equipped enough to choose aggressive and defensive assets at the right time. A number of tools have been developed over time. But the tools used in this study are Treynor and Mazuy model which was developed in 1966 and Henriksson and Merton model developed in 1981. The direct observation of neither the market forecasts nor portfolio composition is required in these techniques. The present research is an attempt to differentiate the ability of the fund manager to time the market i.e. ability to predict the market fluctuations.

4.5 Treynor-Mazuy Model

This model is built on the notion that fund managers try continually to outguess the market by oscillating between two characteristic lines - one, with high volatility and the other, with low volatility. It illustrates that whenever a fund manager tries the high volatile composition the market rises. On the contrary, when the fund manager has chosen the low volatile composition the market falls. The net characteristic line of a fund that continually beat the market is not a straight line. The quadratic regression form of this model may be represented as:

$$E(r_p) - r_f = \hat{\alpha}_p + \hat{\beta}_{0,p} [E(r_m) - r_f] + \hat{\beta}_{1,p} [E(r_m) - r_f]^2 + \varepsilon_p$$

Where,

$E(r_p)$ = Expected rate of return on portfolio

r_f = Risk free rate of return

$E(r_m)$ = Expected rate of return on market portfolio

$\hat{\alpha}_p, \hat{\beta}_{0,p}, \hat{\beta}_{1,p}$ are parameters of regression equation

ε_p = Error term

The standard regression used to estimate Jensen index is extended with the squared excess return of the benchmarked portfolio.

A significant positive value of $\hat{\alpha}_p$ indicates superior timing skill of the fund manager i.e. the manager is capable of choosing right stock at the right time. On the contrary, a significant negative value of $\hat{\alpha}_p$ indicates pervasive timing skill of the fund manager i.e. the fund manager does not have the ability to select the right stock according to the market movement. In the regression equation is an estimate of selectivity component of the fund manager's performance.

4.6 The Merton-Henriksson Model

Merton and Henriksson (1981) and Henriksson (1984) proposed a different model of market timing measurement. This model assumes that for each period, the fund manager will attempt to forecast whether the

market will have positive or negative excess returns. The regression form of the model is

$$z_p(t) - R(t) = \hat{\alpha} + \hat{\beta}_1 x(t) + \hat{\beta}_2 y(t) + \varepsilon(t)$$

Where

z_p = Rate of return on the portfolio, p

$x(t) = \text{Max}[0, \{Z_m(t)\}] = \text{Max}[0, -x(t)]$

$y(t) = \text{Max}[0, \{R(t) - Z_m(t)\}] = \text{Max}[0, -x(t)]$

$\varepsilon(t)$ = Error term

The regression equation can further be simplified as

$$z_p(t) - R(t) = \alpha + \beta_p [Z_m(t) - R(t)] + \delta_{hmu} x(t) + \varepsilon(t)$$

A significant positive value of δ_{hmu} would indicate the timing ability of the fund manager. When $Z_m(t) > R(t)$, $x(t) = Z_m(t) - R(t)$ and $y(t) = 0$, β_1 has a rather intuitive interpretation as the up-market beta of the portfolio. Similarly, $y(t) = Z_m(t) - R(t)$, and $x(t) = 0$, when $Z_m(t) < R(t)$ so, β_2 can be interpreted as the down market beta of the portfolio. A fund manager having rational timing skill, will always maintain $\beta_1 > \beta_2$. So, the test for market timing ability using specification would be to show that β_1 is significantly greater than β_2 . In other words, the expected up market beta of the portfolio managed by a successful macro forecaster would be greater than the expected down market beta of his portfolio.

Table 2 : Stock-Selection Ability Results of Persistence of Various Models Used

Model	Jensen model	Treynor-Mazuy model	Merton-Henriksson model
Alpha	0.13923424	-0.036559308	0.000698888
t-statistics*	0.13923424	-0.342969074	0.76215211

*At 5% level of significance

5.0 Methodology

The basic models have been used as follows for evaluating performance persistence:

5.1 Persistence

To evaluate persistence, Grinblatt and Titman (1992) methodology has been used. In this study, persistence has been evaluated using the following steps: first, the one hundred sixty-eight months sample period is divided into two sub-periods of equal length i.e. two eighty-four month sub-periods. Second, they compute Jensen Index and betas of Treynor-Mazuy and Merton-Henriksson of each fund for each eighty-four month sub-period. Third, they run a regression of the following form:

$$\alpha_{i,t} = \gamma_{0,i} + \gamma_{1,i} \alpha_{i,t-1} + \varepsilon_{i,t}$$

Where,

i = 1 to N, the number of mutual funds in the sample.

T = Last sub-period

$t-1$ = First sub-period

$\alpha_{i,t}$ = Jensen Index (or betas of Treynor-Mazuy, Merton-Henriksson models) of fund i in last sub-period, t

$\alpha_{i,t-1}$ = Jensen Index (or betas of Treynor-Mazuy, Merton-Henriksson models) of fund i in first sub-period, t-1

$\gamma_{0,i}$ = Regression coefficient

$\gamma_{1,i}$ = Estimated slope coefficient

$\varepsilon_{i,t}$ = Error term

Finally, a significant positive t-statistics for $\gamma_{1,i}$ would indicate that past abnormal performance with special reference to the ability to select the right stock (stock

selection) at the right time (timing), has direct relationship with future returns. In other words, if one measures fund performance using Jensen Index and finds a positive significant t-statistics for $\gamma_{1,i}$, there is evidence of persistence in mutual fund performance. Similarly, if one measures timing ability using betas of Treynor-Mazuy and Merton-Henriksson models and finds a positive significant t-statistics for $\gamma_{1,i}$, there is evidence of persistence in mutual fund managers timing skills.

5.2 Empirical Results

The empirical results of persistence are as furnished below:

6.0 Persistence

Persistence in mutual funds is evaluated in both stock selection ability and timing ability of the fund managers.

6.1 Persistence in Stock Selection Ability

Persistence in stock selection ability of the fund managers of the selected funds is evaluated using Jensen model, Treynor-Mazuy model and Merton-Henriksson model. The results are as under (Refer table no. 2):

6.2 Jensen Model Results

From Table 2, it can be concluded that while estimating persistence in the selection ability of fund managers using Jensen alpha, the model does not give statistically significant evidence of persistence. It can be concluded so on the basis of t-statistics (0.13923424) of Jensen's alpha (0.13923424) which is not significant at 5 per cent level of significance.

6.3 Treynor-Mazuy Model Results

As per Treynor-Mazuy model, it has been observed that there is no statistically significant persistence in stock selection ability of fund managers. The result is concluded from Table 2, on the basis of t-statistics

(-0.342969074) of Jensen's alpha (-0.036559308) which is not significant at 5 per cent level of significance.

6.4 Merton-Henriksson Model Results

Similar to other models, this model also does not give statistically significant evidence of persistence in stock selection ability of the fund managers. The result is concluded from Table 2, on the basis of t-statistics (0.76215211) of Jensen's alpha (0.000698888) which is not significant at 5 per cent level of significance.

6.5 Persistence in Market Timing Ability

Persistence in timing ability of the fund managers of the selected funds is evaluated using Treynor-Mazuy model and Merton-Henriksson model. The results are as under (Refer table no 3).

6.6 Treynor-Mazuy Model Results

While estimating persistence in the timing ability of fund managers using Treynor-Mazuy model, the model does not give statistically significant evidence of persistence in the market timing ability of the fund managers. The conclusion has come from t-statistics (-0.342969074) value of beta of Treynor-Mazuy model (-0.038855262) which is not significant at 5 per cent level of significance

6.7 Merton-Henriksson Model Results

Similar to Treynor-Mazuy model, this model also does not give statistically significant evidence of persistence in market timing ability of the fund managers. The conclusion has come from t-statistics (-1.221886878) value of beta of Merton-Henriksson model (-0.094466657) which is not significant at 5 per cent level of significance

But it has also been observed that Merton-Henriksson model improves the t-statistics of persistence of perverse market timing at 10 per cent, but not to the level of significance. The study provides no evidence of persistence in Indian mutual fund markets.

Table 3 : Market-Timing Ability Results of Persistence of Various Models Used

Model	Treynor-Mazuy model	Merton-Henriksson model
Beta	-0.038855262	-0.094466657
t-statistics*	-0.725882517	-1.221886878

*At 5% level of significance

7.0 Conclusion

The study demonstrates that persistence in equity mutual funds' performance does not necessarily imply superior stock selection skills as well as superior timing skills. Common factors in stock returns explain some of the abnormal returns in top ranking mutual fund schemes.

The findings are consistent with those for the mature market. The study offers little evidence that supports management skills or informational advantage. Overall the evidence is in conformity with the efficient market hypothesis. Our results have implications for hedge funds and other managed portfolios that consistently follow "fund of funds" strategy in pursuit of extra-normal returns. Interpreting the

persistence evidence, it will be difficult to implement such a strategy in India at least on net return basis. In this study, the evaluation of persistence in funds' performance has been studied not only owing to selectivity skills but also market timing skills. But no conclusive evidence has been found in the study through which it can be inferred that the Indian fund managers possess superior stock selection ability or superior timing skills. Given the importance of the subject, a comprehensive study is warranted using greater number of funds and longer data period. It will also be relevant to examine the relative role of past performance in fund selection vis-à-vis other factors such as fund size, trading cost, management experience and investment styles.

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