Performance Evaluation of Indian Mutual Funds During Bull and Bear Periods

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Abstract

The present paper evaluated the performance of 47 Indian mutual funds for two separate periods of January 8, 2008 to March 9, 2009 and March 9, 2009 to June 30, 2014 characterized by down period (negative market return of 59%) and up period (positive market return of 67%), respectively. The funds were evaluated on the basis of risk adjusted performance measures like Sharpe measure, Treynor measure, information ratio, Sortino ratio, M Square ; whereas, Jensen measure, Fama net selectivity , Treynor-Mazuy (1966), and Henriksson-Merton (1981) models were used to examine the selectivity and timing skills of fund managers. Results for various risk adjusted performance measures revealed that funds performed poorly during the down period and during the overall period of the study, and also in a different way during down and up periods. The study also found that majority of the funds were able to show signs of selectivity skills during up and overall periods ; whereas, strong evidence of lack of market timing skills was found for all the periods.

Key words: **equity mutual funds, performance evaluation, selectivity skills, market timing skills, risk adjusted performance measure**

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The mutual fund industry in India has shown tremendous growth during the last two decades as it is evident from assets under management that have grown from INR 470 billion in 1993 to INR 9747 billion in 2014, reflecting a CAGR of 14.6% over the last 21 years. At a global level, the AUM (asset under management) to GDP ratio average was 37%, while the same in India stood at 7% - 8%, which shows very low penetration in India (CII- PWC, 2014). Due to lots of uncertainty and market volatility, investors perceive investments in the stock market to be risky and unsafe, and thus, dither to channelize their savings into products like mutual funds. It is required on the part of fund managers to infuse that confidence in the minds of investors and embolden them to remain invested in funds to attain the desired returns.

It is also observed that fund managers should exhibit forecasting skills at both micro and macro levels for better performance. The former deals with selection ability, that is, the ability to select the stocks that are under or overvalued relative to other equities, while latter refers to market timing skills, which means assessing the direction of market correctly and adjust the portfolios according to bullish or bearish trends. Fund managers will increase the beta of the market in a bull market ; whereas, an opposite could be done in bearish markets resulting into outperforming the market by earning higher risk-adjusted returns for shareholders.

Moy, Lee, and Lee (1995) studied the bull and bear market performance of portfolios formed on the basis of Value Line's rankings and found that best-performing securities during bull markets showed unusually poor

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performance during bear market conditions. Muruganandan (2013) concluded that the funds that excelled in the bull market could not be expected to do well in the bear market. Fabozzi and Francis (1979) also opined that in the bull period, fund managers may be able to exhibit good performance due to market timing abilities rather than stock selection skills. Knowing how a mutual fund is likely to perform in both up and down markets will allow an investor to make more appropriate fund selections that may require, at the end of an investor, to switch over to outperformers.

With this backdrop, the present study is devoted to measure the performance of the equity fund schemes in India during the down period (January 8, 2008 - March 9, 2009) and up period (March 9, 2009 - June 30, 2014). The present study has been divided into two parts. The first part of the study deals with performance evaluation of mutual funds on risk adjusted return basis that also includes the Sortino ratio and M Squared ratio other than traditional risk-adjusted performance measures. Sortino ratio takes into consideration the downside risk only (Sortino & Price, 1994) and indicates how much excess returns above minimum acceptable return (MAR) is received for not achieving MAR, which makes more sense as investors are mainly wary of their returns during a downtrend. Another measure, M Squared, defines the performance of a mutual fund as a percentage which enables a lay investor to analyze performance in a more understanding way (Modigliani & Modigliani, 1997). An attempt has also been made in the second part to analyze the selection and market timing ability of fund managers in up and down periods by applying Treynor-Mazuy (1966) and Henriksson-Merton (1981) models.

Literature Review

Treynor (1965), Sharpe (1966), and Jensen (1968) lead the way to evaluate the performance of investment portfolios. Treynor (1965) and Sharpe (1966) suggested methodology to appraise performance by measuring the risk premium of the portfolio relative to systematic risk and total risk, respectively. Jensen (1968) provided the definite standard based on measuring the predictive ability of fund manager.

Sortino and Price (1994) suggested a comparable downside risk ratio by modifying Sharpe ratio as the latter is inconsiderate to MAR (minimum acceptable return) and found during the study the reverse ranking of funds in comparison to that of Sharpe ratio ranking. Modigliani and Modigliani (1997) suggested an alternative measure of risk adjusted performance that allows an investor to identify the best portfolio that has the highest returns (in percentage) for any level of risk, which is in contrast to the conventional method of evaluating the performance using total returns.

The previous studies using risk adjusted performance measures like Sharpe and Treynor measures that found funds underperforming the benchmark among others are : Jayadev (1996) ; Artikis (2003) ; Arugaslan, Edwards, and Samant (2008) ; Guha (2008) ; Puri (2010) ; while studies conducted by Shukla and Singh (1998) ; Redman, Gullett, and Manakyan (2000) ; and Soongswang and Sanohdontree (2011) concluded that funds were able to outperform the market. Few inconclusive findings came from the studies of Thanou (2008) ; Bello and Deridder (2011) ; and Prakash and Sundar (2014).

Narasimhan and Vijayalakshmi (2001) found a high risk level in comparison to returns. Gupta and Aggarwal (2007) evaluated the performance of all the equity-diversified mutual funds for the period from January 2002 to December 2006 using CAPM and Fama-French models and found the contrasting findings from both. Thanou (2008) found significant differences in ranking between up and down market conditions. Arugaslan et al. (2008) evaluated the performance of 50 U.S. - based international equity funds using Sharpe, Treynor, Jensen's measures and M squared during 1994-2003 and concluded that the funds with the highest average returns may not look attractive when risk is embedded for the analysis. Bhatt and Patel (2008) studied the performance evaluation of various mutual funds schemes in India through Sharpe's index model and found the mutual funds as the safest investment for an investor. Bello and Deridder (2011) observed that funds performed remarkably better during the depressed years irrespective of the size of funds under management. Krishna (2012) examined Indian equity

mutual funds during the period from 2008 and 2011 and observed nonexistence of short term performance. Prakash and Sundar (2014) evaluated and compared the performance of equity mutual fund schemes of three AMCs using Sharpe ratio, Treynor ratio, Jensen ratio, and beta and found no conclusive results.

Rich literature was found on investigating the fund manager's selectivity and market timing skills. Jensen (1968) and Fama (1972) pioneered the studies undertaken for evaluating the selectivity skills of fund managers. Jensen (1968) found that none of the 115 mutual fund managers for the period from 1945-1964 were able to outperform a buy-the-market-and-hold policy. Fama (1972) suggested the methodology to distinguish part of an observed returns due to selectivity from that of market timing. Treynor and Mazuy (1966) performed an analysis of over 57 open-ended mutual funds for the period from 1953 to 1962 and found no evidence of market timing abilities. Henriksson and Merton (1981) developed a statistical framework for parametric and non-parametric tests of market-timing ability of fund managers.

The empirical studies, which concluded that fund managers are able to show selectivity skills are the following: Lockwood and Kadiyala (1988) ; Coggin, Fabozzi, and Rahman (1993) ; Gallo and Swanson (1996) ; Daniel, Grinblatt, Titman, and Wermer (1997) ; Kao, Cheng, and Chan (1998) ; Choudhary (2007) ; Guha, Banerji, and Chakarbarti (2007) ; Kumar (2012) ; whereas, few studies that could observe positive market timing skills are among others: Kon (1983) ; Bello and Janjigian (1997) ; Bollen and Busse (2001) ; Jiang, Yao, and Yu (2007) ; Sehgal and Janwar (2008) ; Ang, Gregoriou, and Lean (2014). The studies that found no market timing skills using the Henriksson and Merton (1981) model are, among others, : Chang and Lewellen (1984) ; Sinclair (1990) ; Umamaheswar (2001) ; Philippas (2011) ; whereas, Bello and Janjigian (1997) ; Koulis, Beneki, Adam, and Botsaris (2011) ; and Philippas (2013), among others, observed using the Treynor- Mazuy (1966) model that fund managers lacked selectivity skills. Sinclair (1990) ; Bello and Janjigian (1997) ; and Kao et al. (1998) found signs of perverse timing ability.

Fabozzi and Francis (1979) evaluated the performance of 85 open ended funds for bear and bull markets using Jensen's measures and found no change in performance under different market conditions. Kon (1983) detected positive timing skills in few funds when he empirically examined using switching regression techniques. Henriksson (1984) evaluated 116 mutual funds for the period from 1968 to 1980 and observed no signs of successful timing strategy.

Lockwood and Kadiyala (1988) examined 47 U.S. mutual funds for the period from January 1964 to 1979 with a stochastic parameter regression model and witnessed superior micro forecasting skills but no macro forecasting skills. Koh, Phoon, and Tan (1993) concluded that market timing abilities could not be overlooked among Singapore fund managers.

Bollen and Busse (2001) observed that fund managers exhibited a significant timing ability in daily tests than in monthly tests. Mishra (2002) used Chen and Stockum's (1986) model and concluded that the selected mutual fund schemes had no market timing ability. Bauer, Otten, and Rad (2006) observed no market timing skills among 143 New Zealand mutual funds using a survivorship-bias controlled sample for the period from 1990 - 2003. Anand and Murugaiah (2006) and Choudhary (2007) examined Indian fund managers using Fama methodology and found no sign of market timing ; while the latter observed positive selectivity skills.

Low (2007) examined the performance of Malaysian unit trust funds relative to two separate benchmarks by employing Jensen's model and Henriksson-Merton model and observed the overall negative performance with poor timing abilities. Jiang et al. (2007) examined U.S. equity funds and found positive market timing ability. Sehgal and Janwar (2008) evaluated the performance of Indian equity mutual funds based on multi-factor benchmarks relative to one-factor CAPM and found positive timing ability, while selectivity skills were found to be improved when monthly data was replaced with daily data. Swinkels and Rzezniczak (2009) evaluated the performance of the Polish mutual fund market and found risk adjusted performance comparable with the benchmark but found no market-timing skills.

The authors who conducted studies for Indian funds using both Henriksson and Merton (1981) and Treynor –

Mazuy (1966) models that found neither marketing timing nor selectivity skills are, among others, : Gupta (2001) ; Chander (2006) ; Raju and Rao (2009) ; Dhar and Mandal (2014) ; Zabiulla (2014).

Objectives

(1) To evaluate the performance of mutual funds on the basis of risk adjusted performance measures.
(2) To study the selectivity and market timing ability of fund managers.

Data and Methodology

Using Lipper's database, all those Indian equity funds that have Lipper rating of 4 and 5 based on total returns and also having more than 10 years of existence as on July 11, 2014 were taken into consideration. After few exclusions like midcap funds, MNC funds, and criteria of minimum ₹1000 crores of assets, finally 47 funds out of 67 funds were selected for the purpose of this study.

The overall period of the study is from January 8, 2008 to June 30, 2014 that is segregated into two separate periods of January 8, 2008 to March 9, 2009 and March 9, 2009 to June 30, 2014 characterized by down period (negative market returns of 59%) and up period (positive market returns of 67%), respectively. We used daily data instead of monthly data as daily data shows the true reflection of performance measurement (Bollen & Busse, 2001; Sehgal & Janwar, 2008). Daily data of NAVs has been taken from AMFI website. In this study, the average daily yield for relevant period on 91-day treasury bills is considered as a proxy for risk-free returns that is already used by various studies (Arugaslan et al., 2008; Chander, 2006; Guha et al., 2007) and is preferred over G-Securities (Das, 2013).

The performance assessment has been bifurcated into two parts, to begin with, funds would be evaluated on the basis of risk adjusted performance measures like Sharpe measure, Treynor measure, information ratio, Sortino ratio, M Square ; whereas, the second part would encompass Jensen measure, Fama net selectivity, Treynor-Mazuy (1966), and Henriksson-Merton (1981) models to examine the micro and macro forecasting skills of fund managers. Razafitombo (2010) and Razafitombo (2015) concluded after a study of a large number of performance measures that Sharpe ratio, information ratio, and beta coefficients are the most relevant measures for performance evaluation.

(i) Sharpe Measure : Sharpe (1966) attempted to get a composite measure of portfolio performance. Sharpe ratio analyzes the risk premium of portfolio comparative to the total risk in the portfolio :

$$S_P = \frac{(R_P - R_F)}{\sigma_P}$$

where, R_P is the mean return on fund p ; R_F is the mean risk free rate of return ; σ_P is the standard deviation of return for fund p.

(ii) Information Ratio : Goodwin (1998) and Reilly and Norton (2006) contended that the Sharpe information ratio is a more broad-spectrum measure of portfolio performance than the traditional Sharpe measure. It is a measure of portfolio's performance against risk and returns relative to a benchmark. Sharpe (1994) termed information ratio as ex-post Sharpe ratio that indicates the historic average differential returns (i.e. excess of fund return over benchmark return) per unit of historic variability of the differential return.

$$IR = \frac{(R_P - R_m)}{\sigma_P}$$

where, R_m is the mean return on market index ; σ_P is the standard deviation of excess fund returns over market returns.

(iii) Sortino Ratio : The Sortino ratio indicates how much excess returns above the MAR (minimum acceptable return) is received for the risk of not achieving the MAR. It is the real rate of returns in excess of the investor's minimum required rate of return, per unit of downside risk. In this study, risk free rate of returns has been taken as the MAR.

$$SR = \frac{(R_P - MAR)}{\sigma_d}$$

where, σ_d is the standard deviation of negative returns of portfolio over MAR.

(iv) Treynor Measure : Treynor (1965) proposed the concept of risk premium relative to systematic risk into a single index to measure portfolio performance more accurately.

$$TR = \frac{(R_P - R_F)}{\beta}$$

where, β is obtained from market model $R_P = \alpha + \beta R_m + e$. Here, e is the stochastic error term.

(v) M Square : Leah Modigliani and Franco Modigliani proposed a variant of Sharpe measure that analyzes the risk adjusted performance of any portfolio expressed in basis points which investors are familiar with and is easy to interpret while comparable with that of any other portfolio or in particular market returns over the same period.

$$M\text{Squared} = \frac{(R_P - R_F)}{\sigma_P} \times \sigma_m + R_F$$

where, σ_m is the standard deviation of market index.

(vi) Jensen Measure : Jensen (1968) attempted to measure the absolute performance of fund managers on the basis of predictive ability of selecting undervalued securities or recognizing turning points in markets. Jensen's Alpha is calculated by subtracting the expected returns of each fund (as per CAPM model) from its actual mean returns :

$$\alpha = R_P - [R_F + \beta(R_m - R_F)]$$

(vii) Fama's Net Selectivity : Fama (1972) proposed a measure of net selectivity based on total risk of portfolio as follows :

$$FNS = R_P - [(R_F + (R_m - R_F) \times \sigma p/\sigma_m]$$

The Fama measure of net selectivity reflects the difference between the return on portfolio and return posited by capital market line.

(viii) Treynor-Mazuy Model : Treynor and Mazuy (1966) developed a model in which the mutual fund manager is expected to predict the sign and size of the market movement :

$$R_P - R_F = \alpha + \beta (R_m - R_F) + \Upsilon (R_m - R_F)^2 + \varepsilon$$

where, Υ is the parameter measuring the market timing skill ; ε is the random error term. This performance evaluation model assumes that the manager has private information about the size and magnitude of the market returns and takes linear deviations from his/her long-term average market exposure.

(ix) Henriksson and Merton Model : Jensen (1972) showed that it is impossible to use structural specification $[RP - R_F = \alpha + \beta \times (R_m - R_F) + \varepsilon]$ to separate the incremental performance due to stock selection from the increment due to market timing when the returns data alone are used. The model developed by Henriksson and Merton (1981) successfully proved such a separation by assuming that the manager is having information about the direction of market returns only, and not the size of the returns. This model is :

$$R_P - R_F = \alpha + \beta_1 (R_m - R_F) + \beta_2 [\text{Max}(0, (R_F - R_m)] + \varepsilon$$

where, α measures the stock-selection ability of the fund managers ; β_2 captures the market-timing skills of the fund managers ; ε is the random error term. Positive and statistically significant α shows the superior ability of the portfolio manager in selecting under-valued securities (selectivity) and vice versa ; whereas, statistically significant positive value of β_2 would indicate superior market timing abilities.

Data Analysis and Results

Results for various risk adjusted performance measures corresponding to different periods (down, up, and overall) have been reported in the Table 1. For the down period, it is observed that as per both Sharpe ratio and Treynor ratio, all funds except one have underperformed in comparison to Nifty (benchmark). Information ratio also indicates that majority of funds, that is, 79% of the total funds are unable to perform above average. Only one fund is able to reward the investors considering the aspect of downside volatility as per Sortino ratio. M-squared also concludes that all the funds gave negative returns to investors, though they are able to outperform the benchmark.

In the up period, Sharpe ratio for almost 50% funds is more than that of benchmark, with 17 funds being statistically significant while only one fund out of the underperforming funds is statistically significant. As per the information ratio, 23 funds performed above average, with eight funds being statistically significant ; whereas, none of the underperforming funds are statistically significant. Sortino ratio for 22 funds out of 47 funds is better than that of the benchmark. Treynor ratio for 62% funds indicates that these funds rewarded investors better than the benchmark when taking market risks into consideration. Out of these, 17 funds show statistically significant results while all the underperforming funds are statistically insignificant. M- Squared shows that 28 funds out of 47 funds have underperformed in comparison to the market.

For the overall period, 57% of the funds have performed poorly as per both Sharpe ratio and information ratio, but none of them is significant. As per Treynor ratio and Sortino ratio, 27 funds out of the total 47 funds have performed poorly than the benchmark. According to M- Squared, 55% of the funds out of the total funds gave negative returns in comparison to the market.

It is inferred from the Table 1 that the funds performed poorly during the down period and overall period of the study, but the results are not statistically significant. Furthermore, no conclusive results are found for the up period, though majority of the outperforming funds are statistically significant.

The Table 2 shows the ranking of all funds according to various risk adjusted performance measures pertaining

Table 1. Risk Adjusted Performance Measures for All Periods (Down, Up, & Overall)

	Sharpe Ratio			Information Ratio			Sortino Ratio			Treynor Ratio			M-Squared (%)		
FUND#	Down	Up	Overall	Down	Up	Overall	Down	Up	Overall	Down	Up	Overall	Down	Up	Overall
BIRLA1	-0.157*	0.041	-0.016	-0.068	-0.021	-0.031	-0.193	0.059	-0.022	-0.448*	0.059	-0.029	-0.138	0.060	0.002
BIRLA2	-0.157*	0.069*	0.000	-0.068	0.049	0.014	-0.193	0.109	0.000	-0.448*	0.094*	0.000	-0.138	0.0 88	0.019
BIRLA3	-0.143	0.036	-0.016	-0.007	-0.035	-0.027	-0.178	0.052	-0.021	-0.417	0.051	-0.029	-0.124	0.055	0.003
BIRLA4	-0.131	0.071*	0.010*	0.043	0.067*	0.054*	-0.165	0.112	0.013	-0.369	0.094*	0.016*	-0.112	0.090	0.028
CANARA1	-0.144	0.057	-0.005	-0.034	0.006	-0.001	-0.179	0.086	-0.007	-0.412	0.084	-0.095	-0.125	0.077	0.014
CANARA2	-0.144	0.083*	0.008	-0.034	0.060*	0.037	-0.179	0.138	0.011	-0.412	0.113*	0.144	-0.125	0.102	0.027
CANARA3	-0.145	0.040	-0.018	-0.044	-0.012	-0.018	-0.173	0.057	-0.023	-0.449	0.090	-0.060	-0.127	0.060	0.001
DSP1	-0.159	0.030	-0.021	-0.010	-0.033	-0.026	-0.186	0.039	-0.027	-0.497	0.048	-0.042	-0.140	0.049	-0.002
DSP2	-0.162	0.019	-0.031	-0.066	-0.040	-0.045	-0.192	0.025	-0.039	-0.489*	0.034	-0.063*	-0.143	0.039	-0.013
DSP3	-0.154*	0.069*	-0.001	-0.026	0.026	0.010	-0.192	0.106	-0.002	-0.440*	0.094*	-0.002	-0.136	0.088	0.018
DSP4	-0.136	0.026	-0.022	-0.010	-0.048	-0.031	-0.155	0.036	-0.028	-0.463	0.039	-0.044	-0.117	0.045	-0.004
DSP5	-0.126	0.058	0.005	0.078	0.005	0.026	-0.158	0.089	0.007	-0.358	0.078	0.008	-0.107	0.077	0.024
FK1	-0.200*	0.096	0.007	-0.080	0.061*	0.020	-0.237	0.149	0.010	-0.621*	0.147*	0.043	-0.181	0.115	0.026
FK2	-0.172	0.022	-0.030	-0.049	-0.034	-0.028	-0.203	0.028	-0.037	-0.591*	0.039	-0.699	-0.153	0.041	-0.011
FK3	-0.141	0.073*	0.008	0.029	0.033	0.016	-0.178	0.114	0.011	-0.407*	0.101*	0.119	-0.122	0.092	0.026
FK4	-0.154	0.038	-0.018	-0.013	-0.024	-0.013	-0.189	0.051	-0.024	-1.005*	0.059	-0.081	-0.135	0.057	0.001
FK5	-0.136	0.079*	0.009	0.007	0.048	0.014	-0.173	0.126	0.013	-0.846	0.107*	0.036	-0.118	0.098	0.028
HDFC1	-0.194	0.039	-0.029	-0.077	-0.019	-0.035	-0.220	0.052	-0.036	-0.675*	0.067	-0.063	-0.175	0.058	-0.011
HDFC2	-0.175*	0.089*	0.007	-0.028	0.052	0.025	-0.212	0.140	0.010	-0.515*	0.123*	0.013	-0.157	0.108	0.026
HDFC3	-0.158	0.037	-0.015	-0.039	-0.014	-0.020	-0.190	0.049	-0.020	-0.491	0.059	-0.030	-0.139	0.056	0.004
HDFC4	-0.148	0.080*	0.014*	-0.004	0.076*	0.049	-0.183	0.126	0.020	-0.430	0.111*	0.025*	-0.129	0.099	0.033
HDFC5	-0.164	0.029	-0.024	-0.039	-0.032	-0.033	-0.197	0.039	-0.030	-0.495*	0.047	-0.046	-0.145	0.048	-0.005
HDFC6	-0.153*	0.070*	0.004	0.004	0.033	0.024	-0.189	0.108	0.006	-0.435*	0.097*	0.008	-0.134	0.089	0.023
HDFC7	-0.189	0.035	-0.028	-0.071	-0.023	-0.036	-0.216	0.045	-0.035	-0.643*	0.057	-0.059	-0.170	0.054	-0.009
HDFC8	-0.170*	0.084*	0.009	-0.013	0.058*	0.030	-0.208	0.132	0.012	-0.497*	0.114	0.015	-0.151	0.103	0.027
HDFC9	-0.178	0.039	-0.024	-0.065	-0.016	-0.030	-0.204	0.052	-0.030	-0.616*	0.065	-0.051	-0.159	0.058	-0.005

HDFC10	-0.156	0.087*	0.012	-0.005	0.056*	0.036	-0.193	0.137	0.016	-0.455*	0.121*	0.021	-0.138	0.106	0.031
HDFC11	-0.152	0.038	-0.016	-0.038	-0.019	-0.024	-0.184	0.054	-0.021	-0.474	0.057	-0.031	-0.133	0.057	0.003
HDFC12	-0.127	0.070*	0.013*	0.052	0.067*	0.059*	-0.162	0.110	0.018	-0.361	0.095*	0.022*	-0.109	0.089	0.031
IC1	-0.156	0.044	-0.021	-0.037	-0.022	-0.025	-0.187	0.059	-0.026	-0.480	0.072	-0.041	-0.137	0.063	-0.002
IC2	-0.128	0.092*	0.014*	0.058	0.034	0.039	-0.161	0.143	0.019	-0.365	0.129*	0.025*	-0.109	0.111	0.033
IC3	-0.175*	0.044	-0.019	-0.076	-0.007	-0.023	-0.205	0.055	-0.023	-0.548*	0.078	-0.039	-0.157	0.063	0.000
IC4	-0.164*	0.100*	0.013	-0.036	0.070*	0.037	-0.200	0.158	0.018	-0.485*	0.141*	0.023	-0.145	0.119	0.032
IC5	-0.134	0.011*	-0.029	-0.024	-0.051	-0.047	-0.168	0.014	-0.037	-0.389	0.019	-0.057	-0.116	0.030	-0.010
IC6	-0.115	0.066*	0.006*	0.132*	0.032	0.049	-0.148	0.104	0.009	-0.319	0.088*	0.011*	-0.096	0.085	0.025
REL1	-0.177	0.030	-0.026	-0.050	-0.032	-0.036	-0.207	0.040	-0.034	-0.565*	0.048	-0.053	-0.158	0.049	-0.008
REL2	-0.168*	0.068	0.001	-0.022	0.028	0.012	-0.203	0.103	0.001	-0.497*	0.097	0.001	-0.149	0.087	0.020
SBI1	-0.150	0.027	-0.022	-0.044	-0.032	-0.035	-0.186	0.036	-0.029	-0.437	0.044	-0.043	-0.131	0.047	-0.003
SBI2	-0.210*	0.059	-0.017	-0.113	0.009	-0.016	-0.246	0.075	-0.021	-0.659*	0.128	-0.039	-0.191	0.078	0.002
SBI3	-0.164	0.048	-0.010	-0.006	-0.009	-0.009	-0.201	0.065	-0.013	-0.493*	0.075	-0.019	-0.145	0.067	0.009
SBI4	-0.155	0.101*	-0.040*	-0.041	-0.057*	-0.055*	-0.187	0.002	-0.049	-0.468	0.003	-0.085*	-0.136	0.021	-0.021
SBI5	-0.164	0.023	-0.032*	-0.061	-0.044	-0.048	-0.193	0.031	-0.040	-0.531*	0.037	-0.063*	-0.145	0.043	-0.013
SUND1	-0.160	0.019	-0.026	-0.019	-0.048	-0.038	-0.188	0.027	-0.034	-0.494*	0.030	-0.050	-0.141	0.038	-0.007
TATA1	-0.179*	0.093*	-0.002	-0.089	0.037	0.006	-0.215	0.146	-0.003	-0.530*	0.139*	-0.003	-0.160	0.112	0.017
TATA2	-0.137	0.035	-0.013	0.030	-0.036	-0.020	-0.171	0.050	-0.018	-0.393	0.051	-0.024	-0.119	0.055	0.006
TATA3	-0.139	0.063	0.002	0.025	0.017	0.018	-0.174	0.098	0.002	-0.399	0.084*	0.003	-0.121	0.082	0.020
TAUR1	-0.166	0.065	-0.012	-0.125*	0.031	-0.018	-0.204	0.102	-0.016	-0.503*	0.092	-0.022	-0.147	0.084	0.007
NIFTY	-0.120	0.048	-0.004	-	-	-	-0.153	0.076	-0.006	-0.333	0.063	-0.006	-	-	-

*significant at the 5% level, #Funds details are given in the Appendix

Table 2.Funds Ranking Based on Risk Adjusted Performance Measures

	Sharpe Ratio			Information Ratio			Sortino Ratio			Treynor Ratio			M-Squared (%)		
Fund#/Period	Down	Up	Overall	Down	Up	Overall	Down	Up	Overall	Down	Up	Overall	Down	Up	Overall
BIRLA1	25	28	28	39	31	36	28	25	29	17	31	25	25	27	28
BIRLA2	26	17	18	40	10	16	29	14	18	18	17	18	26	16	18
BIRLA3	12	35	26	14	40	33	13	30	28	12	36	24	12	34	26
BIRLA4	5	13	6	5	3	2	6	12	6	5	18	10	5	12	6
CANARA1	13	24	21	24	22	21	14	22	21	10	23	46	13	23	21
CANARA2	14	9	9	25	6	6	15	6	9	11	9	1	14	8	9
CANARA3	15	29	30	32	26	25	9	27	30	19	20	40	15	28	30
DSP1	28	39	34	15	38	32	18	38	34	32	37	31	28	38	34
DSP2	30	45	45	38	42	44	27	45	45	26	44	43	30	44	45
DSP3	21	16	19	22	19	19	26	16	19	16	16	19	21	15	19
DSP4	7	42	36	16	44	37	2	40	35	21	42	33	7	41	36
DSP5	2	23	14	2	23	10	3	21	14	2	24	14	2	22	14
FK1	46	3	12	44	5	13	46	2	12	42	1	3	46	2	12
FK2	38	44	44	34	39	34	36	43	43	40	41	47	38	43	44
FK3	11	12	10	7	15	15	12	11	10	9	12	2	11	11	10
FK4	20	33	31	17	34	23	24	33	32	47	32	44	20	32	31
FK5	8	11	7	9	11	17	10	9	7	46	11	4	8	10	7
HDFC1	45	31	43	43	30	39	45	32	42	45	28	42	45	30	43
HDFC2	24	7	5	12	8	8	30	7	5	20	7	9	24	6	5
HDFC3	18	32	27	28	29	30	17	29	26	23	34	27	18	31	27
HDFC4	3	14	4	4	4	1	5	13	4	3	15	8	3	13	4
HDFC5	39	6	11	23	9	11	42	5	11	35	6	12	39	5	11
HDFC6	27	34	25	30	27	28	25	35	25	27	30	26	27	33	25
HDFC7	16	10	2	11	1	4	16	10	1	13	10	5	16	9	2
HDFC8	34	40	37	29	37	38	32	39	38	30	39	34	34	39	37
HDFC9	19	15	15	10	14	12	23	15	15	14	14	15	19	14	15
HDFC10	44	37	41	41	33	42	44	36	41	43	33	39	44	36	41
HDFC11	37	8	8	18	7	9	41	8	8	31	8	11	37	7	8
HDFC12	42	30	38	37	28	35	38	31	37	41	29	36	42	29	38
IC1	23	27	33	27	32	31	20	26	33	24	27	30	23	26	33
IC2	4	5	1	3	13	5	4	4	2	4	4	6	4	4	1
IC3	40	26	32	42	24	29	39	28	31	38	25	29	40	25	32
IC4	33	2	3	26	2	7	33	1	3	25	2	7	33	1	3
IC5	6	47	42	21	46	45	7	46	44	6	46	38	6	46	42
IC6	1	19	13	1	16	3	1	17	13	1	21	13	1	18	13
REL1	41	38	40	35	36	41	40	37	39	39	38	37	41	37	40
REL2	36	18	17	20	18	18	35	18	17	33	13	17	36	17	17
SBI1	17	41	35	33	35	40	19	41	36	15	40	32	17	40	35
SBI2	47	22	29	46	21	24	47	23	27	44	5	28	47	21	29
SBI3	31	25	22	13	25	22	34	24	22	28	26	21	31	24	22
SBI4	22	1	47	31	47	47	21	47	47	22	47	45	22	47	47
SBI5	32	43	46	36	43	46	31	42	46	37	43	41	32	42	46
SUND1	29	46	39	19	45	43	22	44	40	29	45	35	29	45	39
TATA1	43	4	20	45	12	20	43	3	20	36	3	20	43	3	20
TATA2	9	36	24	6	41	27	8	34	24	7	35	23	9	35	24
TATA3	10	21	16	8	20	14	11	20	16	8	22	16	10	20	16
TAUR1	35	20	23	47	17	26	37	19	23	34	19	22	35	19	23

#Funds details are given in the Appendix

Table 3. Spearman's Ranking Correlation Matrix for All Periods (Down, Up, and Overall)

Spearman Rank Correlation	Sharpe Ratio	Information Ratio	Sortino Ratio	Treynor Ratio	M-Squared (%)
Down-Up	0.053	0.216	-0.029	0.05	0.042
Down-Overall	0.368*	0.533*	0.241	0.362**	0.368*
Up-Overall	0.781*	0.907*	0.921*	0.786*	0.90*

*significant at the 1% level, ** significant at the 5% level

Table 4. Spearman's Ranking Correlation Matrix for All Risk Adjusted Performance Measures

Spearman Rank Correlation Matrix	Sharpe Ratio	Information Ratio	Sortino Ratio	Treynor Ratio	M-Squared (%)
Sharpe Ratio	1				
Information Ratio	0.777*				
	0.832*	1			
	0.954*				
Sortino Ratio	0.975*	0.744*			
	0.871*	0.948*	1		
	0.998*	0.959*			
Treynor Ratio	0.830*	0.640*	0.792*		
	0.848*	0.930*	0.961*	1	
	0.992*	0.843*	0.919*		
M-Squared (%)	1*	0.777*	0.975*	0.830*	
	0.875*	0.957*	0.996*	0.973*	1
	1*	0.954*	0.998*	0.920*	

*significant at the 1% level ; first, second, and third row indicates down, up, and overall period, respectively

to different time periods. To find out whether the funds are able to perform in the same way during down and up periods, Spearman ranking correlation coefficient has been calculated as shown in the Table 3. It is found that for all measures, correlation between down-up periods is very low, indicating that the funds have performed differently during down and up periods. Furthermore, the negative correlation coefficient of Sortino ratio indicates that performance differs drastically when downside volatility comes into consideration. It is also observed that funds are not able to match their down period ranking with that of the overall period, while high correlation between up- overall periods for all measures (all statistically significant) concludes that up periods contribute significantly towards the overall performance of funds.

To add more credence to these findings, an attempt was made to confirm whether various risk adjusted performance measures are ranking funds in a similar way. For that, correlation coefficient between various risk measures is calculated, and as per the Table 4, that shows Spearman's ranking correlation matrix, it is concluded that all measures have high statistically significant correlation, which means all measures are ranking no differently and justifying the scope of few measures for further evaluating the funds' performance.

The Table 5 shows the selectivity parameters based on various measures. For the down period, all funds barring one have negative alpha based on Jensen's measure, Fama model, and Treynor-Mazuy (1966) model, out of which 21 fund results are statistically significant, while 39 funds show negative selectivity as per the Henriksson-Merton (1981) model indicating a strong evidence that fund managers are unable to exhibit selectivity skills.

For the up period, majority of the fund managers are able to exhibit selectivity skills with statistically significant results when evaluated on the basis of Jensen measure, Fama model, Treynor-Mazuy (1966) model,

Table 5. Selectivity Parameter for All Periods (Down, Up, & Overall)

FUND#	Jensen alpha (α)			Fama Net Selectivity			Treynor-Mazuy (α)			Henriksson-Merton (α)		
	Down	Up	Overall	Down	Up	Overall	Down	Up	Overall	Down	Up	Overall
BIRLA1	-0.0981*	-0.0043	-0.0197	-0.0879	-0.0107	-0.0193	-0.1004*	-0.0129	-0.0265	-0.0573	0.0089	0.0043
BIRLA2	-0.0982*	0.0269*	0.0057	-0.0880	0.0242	0.0059	-0.1006*	0.0188	0.0005	-0.0577	0.0456*	0.0373*
BIRLA3	-0.0684	-0.0105	-0.0182	-0.0533	-0.0165	-0.0177	-0.0758	-0.0173	-0.0270	-0.0657	-0.0112	-0.0195
BIRLA4	-0.0294	0.0266*	0.0196*	-0.0237	0.0255	0.0197	-0.0354	0.0225*	0.0129	-0.0291	0.0391*	0.0249*
CANARA1	-0.0641	0.0164	-0.0016	-0.0571	0.0099	-0.0011	-0.0582	-0.0002	-0.0082	-0.0194	-0.0166	0.0081
CANARA2	-0.0645	0.0394*	0.0170	-0.0576	0.0367	0.0173	-0.0606	0.0233*	0.0121	-0.0233	0.0130	0.0356*
CANARA3	-0.0945	0.0145	-0.0233	-0.0661	-0.0104	-0.0214	-0.0887	-0.0328	-0.0363	0.0324	-0.0734	0.0203
DSP1	-0.1140	-0.0121	-0.0258	-0.0829	-0.0241	-0.0248	-0.0699	-0.0052	-0.0170	0.0043	0.0501	0.0325
DSP2	-0.1295*	-0.0231	-0.0453*	-0.1038	-0.0396	-0.0441	-0.1383*	-0.0189	-0.0359	-0.0691	0.0356	0.0233
DSP3	-0.0860*	0.0242*	0.0039	-0.0774	0.0218	0.0041	-0.1051*	0.0293*	0.0092	-0.0836	0.0687*	0.0454*
DSP4	-0.0978	-0.0205	-0.0299	-0.0391	-0.0285	-0.0289	-0.0816	-0.0156	-0.0271	-0.0747	0.0036	-0.0143
DSP5	-0.0184	0.0123	0.0120	-0.0114	0.0099	0.0122	0.0198	0.0185*	0.0168	0.0468	0.0486*	0.0345*
FK1	-0.2014*	0.0850*	0.0148	-0.1726	0.0518	0.0155	-0.1641*	0.0246	0.0194	-0.1025	-0.1081*	0.0970*
FK2	-0.1796*	-0.0189	-0.0439	-0.1232	-0.0365	-0.0413	-0.0916	-0.0248	0.0060	-0.0272	-0.0129	0.0409
FK3	-0.0535	0.0290*	0.0144	-0.0449	0.0260	0.0158	-0.0620	0.0248*	0.0601*	-0.0488	0.0533*	0.0846*
FK4	-0.2445	-0.0039	-0.0243	-0.0789	-0.0140	-0.0213	-0.2200	-0.0063	0.0200	-0.0686	-0.0005	0.0683
FK5	-0.1888	0.0339*	0.0160	-0.0363	0.0319	0.0184	-0.1515	0.0317*	0.0625*	0.0369	0.0449*	0.1231*
HDFC1	-0.2352*	0.0022	-0.0393	-0.1750	-0.0119	-0.0379	-0.2362*	0.0036	-0.0329	-0.2403	0.0250	0.0011
HDFC2	-0.1283*	0.0434*	0.0142	-0.1131	0.0403	0.0145	-0.1125*	0.0475*	0.0228*	-0.0755	0.0677*	0.0575*
HDFC3	-0.1229	-0.0043	-0.0195	-0.0904	-0.0173	-0.0185	-0.1553*	-0.0018	-0.0268	-0.1590	0.0138	-0.0188
HDFC4	-0.0756	0.0421*	0.0266*	-0.0615	0.0383	0.0269	-0.0979*	0.0456*	0.0222	-0.0707	0.0783*	0.0472*
HDFC5	-0.1233*	-0.0136	-0.0307	-0.1000	-0.0258	-0.0298	-0.1334*	-0.0099	-0.0294	-0.1228	0.0161	-0.0067
HDFC6	-0.0770*	0.0268*	0.0113	-0.0692	0.0236	0.0116	-0.0737*	0.0323*	0.0152	-0.0351	0.0664*	0.0470*
HDFC7	-0.2164*	-0.0053	-0.0384	-0.1622	-0.0183	-0.0372	-0.2555*	-0.0037	-0.0430	-0.2754*	0.0104	-0.0270
HDFC8	-0.1143*	0.0394*	0.0163	-0.1002	0.0370	0.0166	-0.1272*	0.0422*	0.0152	-0.0856	0.0641*	0.0439*
HDFC9	-0.2040*	0.0014	-0.0330	-0.1424	-0.0124	-0.0316	-0.2314*	0.0018	-0.0341	-0.2546	-0.0088	-0.0288
HDFC10	-0.0906*	0.0438*	0.0208	-0.0772	0.0400	0.0212	-0.1028*	0.0460*	0.0233	-0.0924	0.0646*	0.0469*
HDFC11	-0.1136	-0.0063	-0.0203	-0.0785	-0.0148	-0.0194	-0.1630*	-0.0028	-0.0285	-0.2026	0.0234	-0.0234
HDFC12	-0.0227	0.0283*	0.0247*	-0.0156	0.0261	0.0249	-0.0575	0.0331*	0.0178	-0.0600	0.0482*	0.0185
IC1	-0.1153	0.0054	-0.0244	-0.0858	-0.0054	-0.0235	-0.1376	0.0156	-0.0049	-0.1668	0.0351	0.0220
IC2	-0.0248	0.0421*	0.0227*	-0.0160	0.0388	0.0230	-0.0274	0.0538*	0.0438*	-0.0042	0.0838*	0.0813*
IC3	-0.1687*	0.0102	-0.0248	-0.1345	-0.0066	-0.0236	-0.0922	0.0175	0.0014	0.0207	0.0503	0.0697*
IC4	-0.1159*	0.0557*	0.0225	-0.0980	0.0517	0.0229	-0.1015	0.0622*	0.0381*	-0.0291	0.0970*	0.0935*
IC5	-0.0501	-0.0380	-0.0439	-0.0357	-0.0545	-0.0429	-0.0862	-0.0390	-0.0447	-0.1200	-0.0494	-0.0517
IC6	0.0132	0.0206*	0.0157*	0.0143	0.0189	0.0158	-0.0090	0.0215*	0.0182*	-0.0217	0.0130	0.0162
REL1	-0.1652*	-0.0127	-0.0349	-0.1277	-0.0246	-0.0339	-0.1519*	-0.0056	-0.0295	-0.0918	0.0879*	0.0409
REL2	-0.1179*	0.0273*	0.0064	-0.1004	0.0222	0.0068	-0.0953	0.0301*	0.0094	-0.0093	0.0856*	0.0654*
SBI1	-0.0884	-0.0172	-0.0306	-0.0730	-0.0294	-0.0296	-0.1044*	-0.0192	-0.0319	-0.0435	-0.0181	-0.0104
SBI2	-0.2382*	0.0365	-0.0215	-0.2050	0.0123	-0.0197	-0.2080*	0.0306	-0.0032	-0.0816	0.0835*	0.0995*
SBI3	-0.1103*	0.0076	-0.0090	-0.0897	-0.0016	-0.0081	-0.1188*	0.0260	0.0024	-0.0535	0.1064*	0.0594*
SBI4	-0.1092	-0.0473	-0.0613*	-0.0833	-0.0686	-0.0597	-0.1128	-0.0447	-0.0541*	-0.1012	0.0241	-0.0033
SBI5	-0.1573	-0.0229	-0.0453*	-0.1116	-0.0331	-0.0442	-0.1736	-0.0146	-0.0394	-0.1386	0.0410	0.0064
SUND1	-0.1162	-0.0281	-0.0370	-0.0880	-0.0412	-0.0342	-0.0721	-0.0346	-0.0478	0.0346	-0.0179	-0.0172
TATA1	-0.1576*	0.0484*	0.0024	-0.1379	0.0419	0.0030	-0.0862	0.0515*	0.0332*	0.0081	0.0831*	0.1109*
TATA2	-0.0469	-0.0102	-0.0138	-0.0373	-0.0164	-0.0134	-0.0475	-0.0138	-0.0198	-0.0098	-0.0069	-0.0081
TATA3	-0.0515	0.0172*	0.0076	-0.0418	0.0152	0.0078	-0.0522	0.0140	0.0032	-0.0145	0.0328*	0.0251*
TAUR1	-0.1631*	0.0249	-0.0135	-0.1322	0.0196	-0.0129	-0.1668*	0.0093	-0.0156	-0.0745	0.0427*	0.0540*

*significant at the 5% level, #Funds details are given in Appendix

Table 6. Timing Parameters for Treynor-Mazuy (TM) and Henriksson-Merton (HM) Models

FUND#	Down		Up		Overall	
	TM ϒ	HM β2	TM ϒ	HM β2	TM ϒ	HM β2
BIRLA1	0.00032	-0.03963	0.00546*	-0.02948	0.00242	-0.04241
BIRLA2	0.00033	-0.03934	0.00510*	-0.04161	0.00188	-0.05580*
BIRLA3	0.00102	-0.00261	0.00428*	0.00093	0.00318*	0.00232
BIRLA4	0.00083	-0.00030	0.00264*	-0.02764*	0.00244*	-0.00934
CANARA1	-0.00079	-0.04294	0.01048*	0.07164*	0.00238	-0.01705
CANARA2	-0.00053	-0.03955	0.01022*	0.05717*	0.00175	-0.03279*
CANARA3	-0.00078	-0.12243	0.03008*	0.19179*	0.00467	-0.07671
DSP1	-0.00607	-0.11493	-0.00439	-0.13748*	-0.00320	-0.10288*
DSP2	0.00120	-0.05877	-0.00272	-0.12941*	-0.00337	-0.12096*
DSP3	0.00264	-0.00230	-0.00329*	-0.09800*	-0.00192	-0.07308*
DSP4	-0.00224	-0.02242	-0.00314	-0.05357	-0.00103	-0.02758
DSP5	-0.00526*	-0.06335	-0.00393*	-0.08024*	-0.00171	-0.03969*
FK1	-0.00507	-0.09577	0.03859*	0.42647*	-0.00165	-0.14505*
FK2	-0.01187*	-0.14738	0.00370	-0.01341	-0.01798*	-0.14959*
FK3	0.00115	-0.00464	0.00263*	-0.05321*	-0.01643*	-0.12377*
FK4	-0.00335	-0.17031	0.00148	-0.00749	-0.01592*	-0.16330*
FK5	-0.00509	-0.21858	0.00142	-0.02415	-0.01674*	-0.18879*
HDFC1	0.00013	0.00492	-0.00090	-0.05084	-0.00229	-0.07112
HDFC2	-0.00218	-0.05132	-0.00257	-0.05381*	-0.00311*	-0.07641*
HDFC3	0.00447	0.03512	-0.00165	-0.04146	0.00262	-0.00131
HDFC4	0.00308	-0.00481	-0.00224	-0.08074*	0.00157	-0.03645
HDFC5	0.00140	-0.00049	-0.00233	-0.06641	-0.00046	-0.04224
HDFC6	-0.00046	-0.04077	-0.00350*	-0.08799*	-0.00141	-0.06297*
HDFC7	0.00539	0.05735	-0.00100	-0.03630	0.00165	-0.02010
HDFC8	0.00179	-0.02784	-0.00177	-0.05586*	0.00041	-0.04858*
HDFC9	0.00378	0.04919	-0.00026	0.02046	0.00039	-0.00741
HDFC10	0.00168	0.00174	-0.00141	-0.04693	-0.00088	-0.04592*
HDFC11	0.00681	0.08646	-0.00221	-0.06619	0.00296	0.00559
HDFC12	0.00480*	0.03621	-0.00306*	-0.04465*	0.00250*	0.01088
IC1	0.00308	0.05003	-0.00652*	-0.06606	-0.00703*	-0.08181*
IC2	0.00036	-0.01995	-0.00746*	-0.09215*	-0.00761*	-0.10340*
IC3	-0.01054*	-0.18406*	-0.00466	-0.08845	-0.00946*	-0.16672*
IC4	-0.00198	-0.08432	-0.00418*	-0.09110*	-0.00562*	-0.12525*
IC5	0.00497	0.06786	0.00060	0.02369	0.00027	0.01367
IC6	0.00306*	0.03396*	-0.00058	0.01560	-0.00091	-0.00098
REL1	-0.00182	-0.07128	-0.00457	-0.22081*	-0.00196	-0.13375*
REL2	-0.00311	-0.10549*	-0.00180	-0.12810*	-0.00108	-0.10417*
SBI1	0.00220	-0.04368	0.00123	0.00201	0.00045	-0.03536
SBI2	-0.00416	-0.15216*	0.00369	-0.10239	-0.00651*	-0.21227*
SBI3	0.00118	-0.05512	-0.01158*	-0.21509*	-0.00407*	-0.12008*
SBI4	0.00050	-0.00782	-0.00167	-0.15547*	-0.00258	-0.10180*
SBI5	0.00225	-0.01815	-0.00525	-0.13932*	-0.00212	-0.09075*
SUND1	-0.00607	-0.14648*	0.00404	-0.02350	0.00389	-0.03492
TATA1	-0.00984*	-0.16097*	-0.00201	-0.07730*	-0.01109*	-0.19130*
TATA2	0.00009	-0.03603	0.00229	-0.00782	0.00216	-0.01010
TATA3	0.00009	-0.03594	0.00203	-0.03445	0.00159	-0.03086*
TAUR1	0.00050	-0.08612	0.00997*	-0.03930	0.00075	-0.11900*

*significant at the 5% level, # Funds details are given in the Appendix

Table 7. Pearson Correlation Matrix for Selectivity and Timing Parameters

Selectivity/Timing	Treynor-Mazuy Model	Henriksson-Merton Model
Down	-0.1726	-0.6483
Up	-0.1919	-0.8119
Overall	-0.5463	-0.8042

and Henriksson-Merton (1981) model ; whereas, also for the overall period, signs of selectivity skills are observed among fund managers using both Treynor-Mazuy (1966) model and Henriksson-Merton (1981) model while the latter established strong evidence as 35 funds out of 47 funds (75%) showed positive selectivity skills with 22 funds being statistically significant. The above results of positive selectivity skills concur with the findings of Lockwood and Kadiyala (1988), Coggin et al. (1993), Gallo and Swanson (1996), Daniel et al. (1997), Kao et al. (1998), Choudhary (2007), Guha et al. (2007), and Kumar (2012).

The Table 6 displays the market timing components for different periods. For the down period, according to the Treynor-Mazuy (1966) model, 19 funds are unable to show positive market timing, while 79% of the fund managers show negative market timing skills as per the Henriksson-Merton (1981) model. Majority of the fund managers are found to be lacking market timing skills for all periods (down, up, and overall) as per both Treynor-Mazuy (1966) model and Henriksson-Merton (1981) model, while the latter provides statistically significant and strong evidence of lack of market timing skills.

The above results of no market-timing abilities concur with the findings of Chang and Lewellen (1984), Henriksson (1984), Lockwood and Kadiyala (1988), Coggin et al. (1993), Gallo and Swanson (1996), Daniel et al. (1997), Umamaheswar (2001), Gupta (2001), Mishra (2002), Choudhary (2007), Guha et al. (2007), Raju and Rao (2009), Zabiulla (2014), Dhar and Mandal (2014), and Kumar (2012).

In addition to evaluating the selectivity and market timing skills of fund managers, we focus on whether there is any relationship between selectivity and market timing ability of fund managers, which is shown in the Table 7. It is concluded that for all periods of our study, there is a perverse relationship between selectivity and market timing. These results are in line with the findings of Sinclair (1990), Chang and Lewellen (1984), Bello and Janjigian (1997), Kao et al. (1998), Cumby and Glen (1990), Choudhary (2007), Henriksson (1984), and Kon (1983).

Research Implications and Conclusion

It is equally important to know how a mutual fund performs both during a bull market and the inevitable bear market to follow as the impact of the bear market would be more wherever returns are concerned. This study can persuade the investors to focus on such mutual funds that have performed well in bull markets as well as in bear markets.

Results for various risk adjusted performance measures corresponding to different periods (down, up, and overall) indicated that funds performed poorly during the down period and overall period of the study, while no conclusive results are found for the up period. It is established that for all measures, correlation between down-up periods is very low, signifying that funds have performed in a different way during down and up periods. Majority of the funds were unable to show selectivity skills during the down period, but some evidence of positive selectivity skills were observed during the up and overall periods of the study. Strong evidence of lack of market timing skills were found for overall period as well as for both down and up periods. The above results concur with the findings of other studies done in the Indian scenario, that is, with the studies of : Choudhary (2007), Guha et al. (2007), and Kumar (2012). It is pertinent to note that for all periods of our study, there is a perverse relationship between selectivity and market timing abilities.

Limitations of the Study and Scope for Further Research

For this present study, only Indian equity funds that have Lipper rating of 4 and 5 based on total returns with few exceptions were considered. Hence, more funds based on other parameters - like consistency in returns and from other categories like balanced funds, sector specific funds might be included. Further research can be done to focus on volatility timing abilities of fund managers which would study the skills to reduce the allocation of risky assets during high volatility periods.

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APPENDIX

BIRLA1	Birla Sun Life Equity Fund-Plan A(Dividend)
BIRLA2	Birla Sun Life Equity Fund-Plan B(Growth)
BIRLA3	Birla Sun Life Frontline Equity Fund-Dividend
BIRLA4	Birla Sun Life Frontline Equity Fund-Growth
CANARA1	Canara Robeco Equity Diversified - Regular Plan - Dividend
CANARA2	Canara Robeco Equity Diversified - Regular Plan - Growth
CANARA3	Canara Robeco Equity Taxsaver - Regular Plan - Dividend
DSP1	DSP BlackRock Equity Fund - Regular Plan - Dividend
DSP2	DSP BlackRock Opportunities Fund-Regular Plan - Dividend
DSP3	DSP BlackRock Opportunities Fund-Regular Plan - Growth
DSP4	DSP BlackRock Top 100 Equity Fund - Regular Plan - Dividend
DSP5	DSP BlackRock Top 100 Equity Fund - Regular Plan - Growth
FK1	Franklin India Prima Fund-Growth
FK2	Franklin India Prima Plus-Dividend
FK3	Franklin India Prima Plus-Growth
FK4	Franklin India Taxshield-Dividend
FK5	Franklin India Taxshield-Growth
HDFC1	HDFC Capital Builder Fund - Dividend Option
HDFC2	HDFC Capital Builder Fund - Growth Option
HDFC3	HDFC Equity Fund - Dividend Option
HDFC4	HDFC Equity Fund - Growth Option
HDFC5	HDFC Growth Fund - Dividend Option
HDFC6	HDFC Growth Fund - Growth Option
HDFC7	HDFC Long Term Advantage Fund - Dividend Option
HDFC8	HDFC Long Term Advantage Fund - Growth Option
HDFC9	HDFC TaxSaver-Dividend Plan
HDFC10	HDFC TaxSaver-Growth Plan
HDFC11	HDFC Top 200 Fund - Dividend Option
HDFC12	HDFC Top 200 Fund - Growth Option
IC1	ICICI Prudential Dynamic - Regular Plan - Dividend
IC2	ICICI Prudential Dynamic - Regular Plan - Growth
IC3	ICICI Prudential Tax Plan - Regular Plan - Dividend
IC4	ICICI Prudential Tax Plan - Regular Plan - Growth
IC5	ICICI Prudential Top 100 Fund - Regular Plan - Dividend
IC6	ICICI Prudential Top 100 Fund - Regular Plan - Growth
REL1	Reliance Growth Fund-Dividend Plan-(D)
REL2	Reliance Growth Fund-Growth Plan-Growth Option
SBI1	SBI Magnum Equity Fund - Regular Plan-Dividend
SBI2	SBI Magnum Global Fund 94 -Regular Plan-Dividend
SBI3	SBI Magnum Multiplier Plus Scheme - 93 - Regular Plan-Dividend
SBI4	SBI MSFU Contra Regular Plan-Dividend
SBI5	SBI Magnum Taxgain Scheme 1993 - Regular Plan-Dividend
SUND1	Sundaram Tax Saver OE - Dividend
TATA1	Tata Ethical Fund Plan A - Growth
TATA2	Tata Pure Equity Fund Plan A- Dividend Option
TATA3	Tata Pure Equity Fund Plan A- Growth
TAUR1	Taurus Starshare Growth Option