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Can Mutual Funds Outguess the Market: Evidence from Bangladesh?

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Abstract This study principally analyzes the fund managers' ability to outguess the market in Bangladesh. We perform the investigation on weekly data of 25 mutual funds for the period of May 16, 2010 to April 28, 2016. To serve our objective, we tested both selection and market timing skills of the fund managers. We have used six measures; average return, Sharpe ratio, Treynor ratio, Information ratio, Jensen's alpha and M square; to confirm the selection skill of fund managers and found no selection skill persistent to most of the fund managers (excluding Aims 1st M.F, ICB AMCL 2nd NRB M.F. and 6th ICB M.F.). In addition, the negative values of alpha indicate that fund managers become not only failed to add value to their portfolio, but also pool wrong assets which hurt the return resulting negative profit. On the other hand, we have employed two popular methodologies; Treynor and Mazuy [24] and Henriksson and Merton [10]; to test the market timing skill of fund managers and found no market timing skill persistent to the fund managers. Thus, with a little exception, we can conclude that fund managers have no ability to outguess the market in Bangladesh.

Keywords: *mutual funds, NAV, market timing, selectivity, fund performance*

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1. Introduction

Mutual funds have evolved over many years and have become an imperative tool to investors, especially small ones. The concept was first used in Netherlands in 1774, but the modern day mutual funds came into existence in 1924, thereafter it tended to obtain popularity. Nonetheless, the term 'mutual fund' can be defined as one variety of investment vehicles that collects funds from various investors and professionally invests the same in diversified assets; like stocks, bonds, money market securities or other assets; to facilitate forming portfolio. Formerly, it was assumed that investment diversification was the foremost attraction of mutual funds, but now the purposes of mutual funds extended widely. Suppose, someone has funds, but may not have enough time, expertise and even resources to undertake such large diversification while a mutual fund can do. In contrast, someone may necessitate fixed income to make payment of a loan. Now a day, mutual fund managers are offering investors with much wider customized funds to deal with their various investments needs.

Now the question is whether the funds mangers are utilizing the investors' money efficiently or not. Are mutual funds are generating returns greater than market average? Here the performance of mutual fund is always concerned for both the investors and fund managers alike. Investors seek this information to facilitate their investment decisions appropriately while fund managers do this to evaluate their own performance in order to realize their flaw. Prior to 1965 the performance of a mutual fund were measured by comparing with other funds' average returns. They just average the funds' returns over a number of periods and then rank them according to their highest returns. In spite of having the importance of risks, very few investors would consider risks in their analysis. Although since 1960s investors have knowledge about quantifying and measuring risk with respect to variability of returns, no single tool essentially considered risk and return simultaneously. Treynor [25] was the first to address this issue and provide a way to measure the funds' risk-adjusted performance. Treynor ratio calculates excess returns of fund for per unit of systematic risk measured by beta. Another approach to calculate fund's return over and above of risk free return for per unit of total risk measured by standard deviation is called Sharp ratio developed by William Sharpe [21]. This ratio is close to Treynor ratio and employs beta as the measure of risk, whereas the Sharp ratio utilizes standard deviation to quantify risk. However, for completely diversified portfolio, the two measures give the identical ranking for an entirely diversified portfolio as the total risk and systematic risk of a fully diversified portfolio are same. Thereafter two years, to appraise the fund managers' skills in assets selection, Jensen [12] proposes a model to calculate alpha (popularly called Jensen's alpha) which evaluates the additional return that the fund produces after adjusting for its systematic risk. In an efficient market, the

expected Jensen's alpha should be zero. A positive alpha implies that the fund manager adds value which is attributable to their skill in pooling superior assets into their portfolio. A comparatively new method to calculate risk-adjusted performance is M^2 which is derived by Franco Modigliani and Leo Modigliani [18]. In estimating M^2, a scheme's portfolio can be levered or de-levered to reflect a standard deviation that is identical with that of the market so that M^2 can be directly compared with the return in the market. Another risk-adjusted measure is information ratio (IR), the ratio of average excess return to tracking error (risk). Like the sharp ratio, the information ratio also calculate excess return per unit of risk with the exception that IR measures excess return and risk relative to a specific benchmark index instead of risk free return. The aforesaid five techniques are popularly used to measure risk-adjusted performance of mutual funds. These techniques are generally used to inspect the selection skill of fund managers.

In addition to risk-adjusted performance, mutual fund managers' market timing skill is also tested. Market timing ability implies the competence of fund managers to predict the market movement correctly, that is, fund managers will effectively "time the market by increasing (decreasing) portfolio exposure prior to market bullish (bearish)" [4]. Two methods are commonly employed to examine the market timing skill of mutual fund managers: the first one was developed by Treynor and Mazuy [24] whereas the other was developed by Henriksson and Merton [10]. Hence, from the above discussion it is apparent that two types of skills are usually inspected to measure the performance of mutual funds: one is security selection skill and another is market timing skill. The abovementioned methods are employed in our study, which are also detailed in the methodology section.

Many researchers and academicians are consistently having researches on mutual funds performance in the globe while a few worked on the same in Bangladesh. Furthermore, researchers in Bangladesh used monthly data as well as small sample in their studies whereas we use weekly data of 25 mutual funds for the period of May 16, 2010 to April 28, 2016. We tested both the selection and market timing skills and found neither skill is pervasive to the fund managers in Bangladesh.

The reminder of the paper is therefore organized as follows. Section 2 describes the history of mutual funds in Bangladesh. Section 3 discusses the previous literature. Section 4 explains the data and methodology applied in the paper. Section 5 presents the result analysis of this research, and Part 6 concludes the study.

2. Mutual Funds in Bangladesh

Investment Corporation of Bangladesh (ICB), a statutory company of Bangladesh government that specialized capital market intermediary, was launched on October 1, 1976. With an aim to enhance market depth and product diversity, ICB issued the first ever mutual fund, the First ICB Mutual Fund, in Bangladesh on April 25th, 1980. It initiated some eight closed end mutual funds till 1996. It took about two decades for private firms to launch any mutual funds in Bangladesh. In March 2000, Asset and Investment Management Services of Bangladesh Limited (AIMS) took the initiative to float the first private sector mutual fund named AIMS First Guaranteed Mutual Fund which truly expanded the orbit of the stock market in Bangladesh. The fund was listed at Dhaka Stock Exchanges in May 2000 making a milestone in the history of the capital market in Bangladesh. However, only closed end mutual funds have been offered to investors till 2010. Prime Finance Asset Management Company Limited (PFAMCL) decided to go one step ahead and launched thecountry's first ever open-end mutual fund. As of April, 2016, there are total 36 mutual funds are listed on the Dhaka stock exchange. Even though lately banks and non-bank financial institutions are also getting heavily involved in mutual fund initiation, this sector accounts less than one percent of the total market capitalization in Bangladesh (Financial Express, 2015).

Since the stock market size and depth were broadening, mutual fund initiators hurdled to meet investors' demand by providing funds with different flavors. High volatility in stock market in Bangladesh always has been a concern for policy makers. Even though investing in mutual fund is generally assumed as safe investment, paradoxically, mutual funds did attract much attention from investors.

3. Literature Review

Although the history of mutual funds in Bangladesh is very long around 33 years, it has not been flourished or developed yet. Mutual funds did not get proper attention from our investors. The performance of mutual funds managers in Bangladesh is now questionable. Are they efficient in producing abnormal return consistently? Do fund managers possess market timing skill? For the greater interest of the investors we need to evaluate the performance of funds managers repeatedly. Extensive researches have been performed regarding the ability of mutual fund managers to beat the market comparing to benchmark index in the developed countries. And a very few researchers in Bangladesh attempted to estimate the performance of mutual funds managers. However, a few number of previous works documented fund managers' market timing skill and to produce abnormal return persistently. Now, we will discuss some of the important works related to our study.

Treynor and Mazuy [24] offered an approach to examine fund managers' market timing capability. They concluded that the Using 57 open-ended mutual funds from the US from 1953 to 1962, they found no convincing support that the fund managers of any of the sample funds had outperformed the market.

Jensen [12] assessed the talent of the fund managers in picking undervalued stocks. He found that fund managers from his 115 sample mutual funds failed so badly in forecasting security prices that result in unsuccessful recover research expenses and fees.

Using all mutual funds in the U.S. survived between January 1, 1975 and January 1, 1995, analyzing book-to-market, size, momentum and turnover of stocks held in deciles, Chen, Jegadeesh, and Wermers [5] noticed that growth funds have distinct ability in selecting undervalued large-growth stocks. They also observed that high-turnover funds are better in picking stocks than

low-turnover funds which have been confirmed by Wermers [26].

Kon and Jen [15] studied fund managers' capability to time the market and selectivity. They concluded that even though fund managers did not possess superior market timing skill, little evidence is observed regarding selectivity.

Jiang [12] applied a nonparametric test to a sample of U.S. funds that used diverse benchmark indices to investigate the market timing skill of mutual fund managers. However, the report failed to provide evidence of superior market timing skill among fund managers during 1980–1999. However, she agreed that it is problematic to foretell funds' timing ability from their visible features.

Kosowskiet et al. [16] employed bootstrap method to net returns data of the universe of U.S. equity funds during the 1975 to 2002 period. They noted robust indication of superior performance which is persistence mostly among growth oriented funds. However, no support of market timing skill of income-oriented fund managers is observed.

Using a sample of 485 arbitrarily selected mutual funds from the DataStream database for the period from 1997 to 2002, Jeffrey [11] observed that mutual funds overall exhibit some evidence of negative sector timing abilities. However, managers in specific groups of funds, for example, aggressive growth funds, seem to hold better sector timing abilities compared to other types of funds, and this is more obvious after controlling for market downturns.

Cuthbertson et al. [6] used 935 actual equity funds performance data from UK between 1975 and 2002 combined with cross-section bootstrap approach to examine whether superior fund performance is because of fund managers' "skill" or "luck." They observed stock picking talent for about 5% to 10% of top performing equity funds in UK. They also found that some of the top performing equity-income funds show stock picking skills, whereas such ability is generally not found among small stock funds and 'all company' funds. This is consistent with the recent empirical evidence found for the U.S. [5,16].

Scaillet et al. [20] applied the "False Discovery Rate" (FDR) technique to the returns of 2,076 U.S. equity funds that subsisted between 1975 and 2006, and noted that the ratio of "skilled" fund managers has declined speedily, while the percentage of "unskilled" fund managers has amplified considerably. They also noticed that the ratio of "skilled" fund managers declined from 14.4% in early 1990 to 0.6% in late 2006, whereas the proportion of "unskilled" funds managers improved from 9.2% to 24.0%.

Białkowski and Otten [1] used a sample of 140 Polish mutual funds for a period of 2000-2008 combined with Carhart's four factor model to investigate the Polish mutual fund industry. They documented that mutual funds in Poland on average failed to add value, as shown by their negative net alphas.

Miglani [17] examined fund managers' market timing skill during 1999 to 2004 in India. To this end, he employed Treynor and Mazuy [24] and Henriksson and Merton [10] approaches. With a sample of 98 mutual funds with diverse investment objectives have been chosen. The report found no evidence that mutual fund managers in India are able to time the market and instead rely only on the stock selection skill to maximize returns.

Charleset et al. (2012) evaluated fund managers' skill to time market liquidity. Employing mutual fund data from CRSP database over the period of 1974 to 2009, they found evidence that fund managers exhibit the talent to time market wide liquidity not only at portfolio level but also at the individual fund level. However, funds demonstrating liquidity-timing skill are likely to have extended histories, greater expense ratios, and larger turnover rates.

Rahman et al. [19] examined the performance of sixteen growth oriented mutual funds listed on the DSE. To this end, the study used monthly returns, the DSE General Index (DGEN) as the benchmark and risk adjusted performance measures proposed by Jenson [12], Treynor [25] and Sharpe [21] Their result suggests that even though some funds have performed better according to Jenson and Treynor measure but did not perform well based on Sharpe ratio.

Hasan and Akhter [9] test the risk adjusted performance of thirteen Bangladeshi mutual funds analyzing monthly data for the period of March, 2007 to April, 2011 and found evidence that most of the mutual funds performed better than DSE benchmark index (DS20). They also tested fund managers' various skills, including diversification, market timing and selectivity skill and found evidence that neither skill of mutual funds was statistically significant in Bangladesh.

4. Data and Methodology

4.1. Data

Weekly NAV of 25 mutual funds listed on the Dhaka Stock Exchange (DSE) has been collected. The data period covers between May 16, 2010 and April 28, 2016. DSE General Index is taken as the benchmark or market index while 91-day Treasury bill of Bangladesh is considered as the risk free rate applicable for Bangladesh. Data on NAV and DGEN is collected from the DSE library. Treasury bill data is gathered from the Bangladesh Bank library.

4.2. Methodology

The Sharpe ratio, also called *reward-to-variability ratio, is developed by William Sharpe* [21] basically describes how well the return of fund i compensates investors for the per unit risk taken. It is computed by dividing the excess return of fund i by its volatility measured by standard deviation. Higher the Sharpe ratio of a fund is preferred. The formula is given below:

$$S_{p,i} = \frac{\bar{R}_{p,i} - \bar{R}_f}{\sigma_{p,i}}.$$

Here, $\bar{R}_{p,i}$ implies the average daily return for the fund i and $\bar{R}_f$ is the average daily risk-free rate, found by dividing the return of the 91-day treasury bill of Bangladesh by 91, and $\sigma_{p,i}$ is the standard deviation of fund i's return used to measure of the fund's volatility.

However, an investor must take into account the length of the time period used in the calculation of Sharpe ratio; longer time period tend to result in lower volatility measures. Spurgin [23] showed that the annualized standard deviation of returns tends to be higher for shorter periods: Daily returns have higher standard deviations than weekly returns, which have higher deviations than monthly returns. He concluded that stretching the estimation period may overstate the Sharpe ratio. Sharpe recommended using short periods, such as, monthly, to estimate risks and returns and then annualizing the data [22]. He believed using multi-period returns complicates the ratio because of compounding or potential serial correlation.

Next we estimated the Treynor ratio, introduced by Jack Treynor [25], to rate mutual funds based on managers' risk adjusted performance.

$$T_{p,i} = \frac{\bar{R}_{p,i} - \bar{R}_f}{\beta_{p,i}}.$$

Here, $\bar{R}_{p,i}$ and $\bar{R}_f$ are defined as above and $\beta_{p,i}$ is the systematic risk of fund i. Like the Sharpe ratio, the higher the Treynor ratio, the better is the performance of the fund.

Modigliani and Modigliani [18] risk-adjusted performance measure (M^2) is relatively a new technique which is closely linked to the Sharpe ratio. In calculating M^2, a portfolio is levered or de-levered so that its standard deviation is equal to that of the market portfolio. And the M^2 of a portfolio is the return that this adjusted portfolio earns. The reasoning behind this adjustment practice is to compare portfolio's adjusted return directly to the market return for the period. The traditional form of the M^2 is given in the below:

$$M^2 = \frac{\bar{R}_{p,i} - \bar{R}_A}{\sigma_{p,i}}\sigma_m + \bar{R}_f = (\text{Sharpe's Ratio})(\sigma_m) + \bar{R}_f.$$

Thus, M^2 value of a fund refers to the additional return an investor can earn from holding a portfolio instead of the market index.

The information ratio (IR), the ratio of average excess return to tracking error, aims to capture the mean-variance attributes of an active portfolio in a single number [8]. The information ratio basically quantifies the magnitude of excess return which is generated from the size of excess risk taken comparing to the benchmark. In this case the benchmark doesn't have to be the risk-free rate. IR is calculated as below:

$$\text{IR}_{p,i} = \frac{\bar{R}_{\text{p,i}} - \bar{R}_{\text{A}}}{\text{S}_{\text{P-A}}}$$

$\bar{R}_{\text{p,i}}$ = Return of the portfolio
$\bar{R}_{\text{A}}$ = Return of the index or benchmark
$\text{S}_{\text{P-A}}$ = Tracking error which is standard deviation of the differences between returns of the mutual fund and the returns of the index.

A portfolio with information ratio of 1.0 is graded as "exceptional," whereas 0.75 and 0.50 is considered "very good," and "good" respectively [7]. After observing IRs over a 10-year horizon, Goodwin [8] noticed that even among constantly outshining long-only managers, not many are able to maintain an IR of 0.50 or higher. However, a general consensus in the investment arena is that IR of 0.20 or 0.30 is superior [14].

To evaluate fund managers' talent in choosing stocks that could outperform the index on a risk-adjusted basis, the Jensen's alpha which derived from the following regression model is used:

$$R_{p,i} - R_f = \alpha_{p,i} + \beta_{p,i}\left(R_m - R_f\right) + \varepsilon_{p,i}.$$

Here, the coefficient $\alpha_{p,i}$, also known as Jensen's alpha, measures the additional return that the fund i earns after adjusting for its systematic risk. In an efficient market, the expected Jensen's alpha should be zero. A positive alpha implies that the fund manager adds value. However, if a fund has a negative Alpha, it is placed below the security market line (SML), and is underperforming what the CAPM would expect its performance to be. Funds with positive (negative) alphas should be positioned at the top (bottom) of funds' ranking. $R_{p,i}$ means the daily portfolio's return for the sample's equity mutual fund i, R_m is the return on the market portfolio and R_f is the risk-free rate, estimated by dividing the return of the 91-day treasury bill of Bangladesh by 91. The coefficient β_i denotes the systematic risk of fund i, that is, the degree of fund's sensitivity with respect to the movements of market portfolio, and ε_i signifies the residuals of regression equation.

After ranking all the 25 mutual funds on the basis of their performance, the consistency of ratings among the four individual criterions have been tested, through the following single cross-sectional regression model:

$$\text{Rating}_{\text{i}} = \alpha + \beta\text{Rating}_{\text{j}} + \text{u}$$

Where, the terms i and j denote the couple of ratings that are regressed. Statistically significant estimations for beta coefficient that reaches unity indicate high consistency among the regressed performance ratings.

To test the market timing ability of mutual fund managers in Bangladesh, two different models have been employed. The first one was developed by Treynor and Mazuy [24] and is expressed as below:

$$R_p - R_f = \alpha + \beta_{p,i}\left(R_m - R_f\right) + \gamma_{\text{p,i}}(R_m - R_f)^2 + \varepsilon_{p,i}$$

Where, R_p = the return on the fund;
R_m = the return on the market portfolio;
R_f = the risk free term;
ε_i = the random error term; and
α, and β are parameters of the model

In the above equation, $\gamma_{\text{p,i}}$ measures mutual fund manager's market timing ability. If a fund manager can forecast market movement accurately, he will increase (decrease) his fund's exposure to market portfolio preceding to market up (decline), and $\gamma_{\text{p,i}}$ will be positive caused by the convex function of fund's return with regard to market return.

Another model used to test market timing ability of the mutual fund managers was introduced by Henriksson and Merton [10].

$$R_p - R_f = \alpha + \beta\left(R_m - R_f\right) + \gamma[D(R_m - R_f)^2] + \varepsilon_{p,i}$$

Where, D is a dummy variable that equals 0 for ($R_m > R_f$) and –1 for ($R_m < R_f$).

The Henriksson-Merton market-timing measure allows for the beta risk to be different in ex-post up and down markets. According to this model in each period fund managers will try to predict whether or not the market will have positive or negative excess returns (rm,t+1>0 or rm,t+1<0). In favor of an optimistic view towards the market, a manager will most likely take more systematic risk, i.e., beta, comparing to a pessimistic forecast about the market. In other words, the mutual fund beta is lower in the case of a bearish market prediction, and the market beta will be higher in the case of a bullish market prediction.

Measurement of Return on Mutual Fund Schemes:

$$R_m = \frac{MP_t - MP_{t-1}}{MP_{t-1}}$$

Where, MP_t = market price of a scheme for current week;
MP_{t-1} = market price of a scheme for the preceding week

$$R_{pt} = \frac{NAV_t - NAV_{t-1}}{NAV_{t-1}}$$

Where, $R_{p,i}$ = Return on fund i;
NAV_t = Net asset value at time t;
NAV_{t-1} = The corresponding value at time $t-1$.

$$\overline{R_m} = \frac{R_{m1} + R_{m2} + R_{m3} + \ldots + R_{mn}}{N}$$

Where, $\overline{R_m}$ = average weekly market return R_{m1}, R_{m2}, R_{m3} …… R_{mn} are returns for the 1st, 2nd, 3rd, and nth week.

$$\overline{R_p} = \frac{(R_{p1} + R_{p2} + R_{p3} + \ldots + R_{pn})}{N}$$

Where, R_{p1}, R_{p2}, R_{p3} … R_{pn} are return for 1st, 2nd, 3rd and nth week based on NAVs
N = total number of weeks of a year.

5. Empirical Results

5.1. Descriptive Statistics

Table 1 represents the descriptive statistics of weekly returns of 25 funds and a comparable index, DGEN (a benchmark index of DSE). It is surprising to observe that all the funds (except 6th ICB M.F., Aims 1st M.F. and ICB AMCL 2nd NRB M.F.) including index have negative mean returns during the sample period. If we compare the funds' average mean returns (-0.0014) with that of index (-0.0011), the funds' performance is inferior to index. Most of the funds are more risky than index as their standard deviations are larger than that of index. The funds' average value of standard deviation is 10.9% while the index's standard deviation is 5.70% which is much lower than that of the funds' average.

Table 1. Descriptive Statistics of weekly returns

Name of Funds	Mean	Median	Min	Max	Standard Deviation	Kurtosis	Skewness
DGEN Index Return	**-0.0011**	**0.009**	**-0.265**	**0.297**	**0.057**	**2.047**	**-0.072**
1st ICB M.F.	-0.007	0.000	-0.899	0.117	0.082	101.773	-9.247
2nd ICB M.F.	-0.007	0.002	-0.904	0.204	0.090	71.415	-7.065
3rd ICB M.F.	-0.006	0.000	-0.903	0.158	0.087	78.756	-7.652
4th ICB M.F.	-0.007	0.000	-0.905	0.168	0.087	80.846	-7.773
5th ICB M.F.	-0.007	0.000	-0.905	0.165	0.088	77.658	-7.537
6th ICB M.F.	0.001	-0.001	-0.908	1.726	0.178	68.135	5.228
7th ICB M.F.	-0.008	0.003	-0.903	0.235	0.090	70.554	-6.913
8th ICB M.F.	-0.007	0.000	-0.903	0.168	0.089	74.231	-7.293
1st BSRS	-0.008	0.002	-0.907	0.193	0.088	75.743	-7.428
Aims 1st M.F	0.058	0.003	-0.514	8.399	0.721	135.582	11.511
ICB AMCL 1st M.F.	-0.010	-0.001	-0.880	0.221	0.091	59.391	-6.294
ICB AMCL Islamic M.F.	-0.008	-0.005	-0.900	0.355	0.095	56.385	-5.598
Grameen M.F. one	-0.004	0.003	-0.373	0.149	0.050	21.062	-2.757
ICB AMCL 1st NRB M.F.	-0.008	-0.001	-0.894	0.227	0.089	68.287	-6.809
ICB AMCL 2nd NRB M.F.	0.008	-0.001	-0.898	3.429	0.308	109.889	9.512
Grameen One: Sch. Two	-0.001	0.001	-0.150	0.123	0.034	4.624	-0.478
Prime Finance First M.F.	-0.001	0.000	-0.365	0.598	0.078	27.382	2.474
EBL First Mutual Fund	-0.001	-0.001	-0.185	0.214	0.039	13.367	-0.311
ICB AMCL Second M.F.	-0.010	-0.003	-0.886	0.217	0.089	67.482	-6.755
ICB Employees Provident MF One: Sch. One	-0.001	-0.004	-0.315	0.204	0.068	3.983	-0.157
Trust Bank First M. F.	-0.001	0.001	-0.136	0.180	0.032	9.952	0.542
Prime Bank 1st ICB AMCL M.F.	-0.002	0.000	-0.115	0.202	0.046	2.429	0.424
DBH First Mutual Fund	-0.001	0.002	-0.152	0.133	0.033	5.343	-0.504
IFIC Bank 1st Mutual Fund	-0.001	0.000	-0.120	0.087	0.024	6.456	-0.667
Phoenix Finance 1st MF	-0.002	0.000	-0.120	0.220	0.049	2.834	0.575
Funds' Average performance	**-0.0014**	**0.000**	**-0.606**	**0.724**	**0.109**	**51.742**	**-2.439**

Another observation is that among all the funds, Aims 1st mutual fund generates the highest mean returns (5.80%), then ICB AMCL 2nd NRB M.F. generates the second highest (0.8%) and the third highest is 6th ICB

M.F. (0.1%). These three funds have generated their mean returns significantly greater than that of index. Although the mean return of IFIC Bank 1st Mutual Fund is negative, it has the lowest risk with the standard deviation of 2.4% whereas the Aims 1st mutual fund's returns has the highest risk with highest mean return. Based on the descriptive statistics, we can conclude that most of the funds' managers have failed to perform better than the market portfolio; i.e. index.

5.2. Risk-adjusted Performance Analysis

Table 2 reports the results of the funds' as well as index's risk-adjusted performance as measured by total average return, Sharpe ratio, Treynor ratio, Information ratio, Jensen's alpha and Modigliani and Modigliani (M square). Funds are ranked based on the value of these six measures and compare with index return. According to total average return, funds' average return (– 0.13%) is less than index's return (-0.10%). The index is ranked on eighth position, implying that most of the funds generating average return less than that of index. The funds' average Sharpe ratio is -0.144 while the corresponding value for the index is -0.132 which is better than funds' average ratio. According to Sharpe ratio, index is ranked on sixth place revealing that most of the funds are performing worse than index. Akin to average return and Sharpe ratio, the remained measures; Treynor, information ratio, Jensen's alpha and M square also reveal the same results. The average values of Treynor ratio, information ratio, Jensen's alpha and M square for the funds are -0.041, -0.031, -0.001 and -0.002 respectively whereas the corresponding values for index are -.007, 0, 0 and -0.001 respectively. The index is ranked on third, eighth, fourth and sixth according to Treynor ratio, information ratio; Jensen's alpha and M square correspondingly.

Table 2. Risk-adjusted performance measures (Rating Analysis)

Name of Mutual Funds	Total Average Return		Sharpe Ratio		Treynor Ratio		Information Ratio		Jensen's Alpha		Modigliani–Modigliani (M square)	
	Value	Ranking	Ratio	Ranking	Ratio	Ranking	Ratio	Ranking	Alpha	Ranking	M square	Ranking
DGEN Index Return	**-0.0010**	**8**	**-0.132**	**6**	**-0.007**	**3**	**0**	**8**	**0.000**	**4**	**-0.001**	**6**
1st ICB M.F.	-0.006	15	-0.148	12	-0.052	18	-0.058	15	-0.006	20	-0.002	12
2nd ICB M.F.	-0.007	19	-0.143	9	-0.037	12	-0.063	19	-0.006	16	-0.002	9
3rd ICB M.F.	-0.007	20	-0.147	11	-0.038	13	-0.064	20	-0.006	18	-0.002	11
4th ICB M.F.	-0.007	21	-0.150	13	-0.046	17	-0.065	21	-0.007	22	-0.002	13
5th ICB M.F.	-0.007	18	-0.145	10	-0.045	16	-0.061	18	-0.007	21	-0.002	10
6th ICB M.F.	0.000	3	-0.032	3	-0.014	4	0.007	6	0.001	3	0.004	3
7th ICB M.F.	-0.007	16	-0.140	7	-0.042	15	-0.059	16	-0.006	17	-0.001	7
8th ICB M.F.	-0.007	17	-0.143	8	-0.041	14	-0.060	17	-0.006	19	-0.002	8
1st BSRS	-0.008	22	-0.153	15	-0.018	5	-0.082	24	-0.004	15	-0.002	15
Aims 1st M.F	0.063	1	0.081	1	0.062	1	0.091	1	0.068	1	0.010	1
ICB AMCL 1st M.F.	-0.010	25	-0.170	18	-0.080	25	-0.085	25	-0.010	25	-0.003	18
ICB AMCL Islamic M.F.	-0.008	24	-0.151	14	-0.071	22	-0.072	22	-0.009	24	-0.002	14
Grameen M.F. one	-0.004	14	-0.193	21	-0.021	9	-0.052	14	-0.002	12	-0.004	21
ICB AMCL 1st NRB M.F.	-0.008	23	-0.160	16	-0.063	20	-0.076	23	-0.009	23	-0.003	16
ICB AMCL 2nd NRB M.F.	0.009	2	0.011	2	0.003	2	0.034	2	0.014	2	0.006	2
Grameen One: Sch. Two	-0.001	10	-0.221	25	-0.019	6	-0.008	10	-0.001	7	-0.006	25
Prime Finance First M.F.	-0.001	7	-0.088	4	-0.055	19	0.001	7	-0.002	10	0.001	4
EBL First Mutual Fund	-0.001	11	-0.194	22	-0.030	11	-0.008	11	-0.002	9	-0.004	22
ICB AMCL Second M.F.	-0.010	26	-0.177	19	-0.072	23	-0.090	26	-0.010	26	-0.003	19
ICB Employees Provident MF One: Sch. One	-0.001	9	-0.104	5	-0.075	24	-0.002	9	-0.002	11	0.000	5
Trust Bank First M. F.	-0.001	4	-0.199	23	-0.020	7	0.012	3	0.000	5	-0.005	23
Prime Bank 1st ICB AMCL M.F.	-0.002	13	-0.177	20	-0.130	26	-0.019	13	-0.004	14	-0.003	20
DBH First Mutual Fund	0.000	6	-0.208	24	-0.020	8	0.007	5	-0.000	6	-0.005	24
IFIC Bank 1st Mutual Fund	-0.001	5	-0.288	26	-0.025	10	0.010	4	-0.001	8	-0.009	26
Phoenix Finance 1st MF	-0.002	12	-0.166	17	-0.069	21	-0.018	12	-0.003	13	-0.003	17
Funds' Average performance	**-0.0013**		**-0.144**		**-0.041**		**-0.031**		**-0.001**		**-0.002**	

It is interesting to observe that among all the funds, Aims 1st M.F is ranked top according to all the measures. ICB AMCL 2nd NRB M.F. is ranked second, 6th ICB M.F. is ranked three while ICB AMCL Second M.F. is ranked lowest by most of the measures. Top rank divulges the securities selection skill of the funds' managers. Thus, the fund managers of Aims 1st M.F, ICB AMCL 2nd NRB M.F. and 6th ICB M.F. have evidently better selection skill than other funds' managers. Hence, considering all the six measures it is evidenced that most of the funds are ranked after the index, meaning that most of the funds' managers happen to failed to perform superiorly than the index as a proxy of market portfolio.

5.3. Regression Analysis Using Jensen's Alpha Model

Table 3 represents the results of the regression of the Jensen's alpha model for all the funds. Jensen's alpha basically indicates the fund managers' asset selection skill into their portfolios. A positive alpha implies that the fund managers add value which is attributable to their skill in pooling superior assets into their portfolios. Here it is observed that most of the funds' alpha is negative illuminating that the securities selection skill of most of the fund managers is very poor. They pooled wrong assets into their portfolios which resulting negative alpha (other skills are penalized by this negative value). Only Aims 1st M.F, ICB AMCL 2nd NRB M.F., 6th ICB M.F., DBH First Mutual Fund and Trust Bank First M. F. have positive alpha signifying that their fund managers become able to add value to the portfolio. Our result is consistent with Jensen [12], Kon and Jen [15], Białkowski and Otten [1], Rahman et al. [19] and Hasan and Akhter [9] who also confirm the inability of fund managers to show assets selection skill.

Table 3. Regression results of Jensen's Alpha (1969) Model

Name of Mutual Funds	Alpha	T-test	Beta	T-test	R-Square	Observation
1st ICB M.F.	-0.006	-0.942	0.236	1.822*	0.023	291
2nd ICB M.F.	-0.006	-0.855	0.349	2.495**	0.042	291
3rd ICB M.F.	-0.006	-0.885	0.342	2.510**	0.043	291
4th ICB M.F.	-0.007	-0.964	0.289	2.114**	0.031	291
5th ICB M.F.	-0.007	-0.908	0.286	2.074**	0.030	291
6th ICB M.F.	0.001	0.091	0.426	1.511	0.016	291
7th ICB M.F.	-0.006	-0.854	0.300	2.130**	0.031	291
8th ICB M.F.	-0.006	-0.870	0.308	2.216**	0.034	291
1st BSRS	-0.004	-0.647	0.737	5.810***	0.193	291
Aims 1st M.F	0.068	1.127	0.900	0.795	0.004	291
ICB AMCL 1st M.F.	-0.010	-1.309	0.201	1.391	0.014	291
ICB AMCL Islamic M.F.	-0.009	-1.111	0.202	1.343	0.013	291
Grameen M.F. one	-0.002	-0.648	0.457	6.554***	0.234	291
ICB AMCL 1st NRB M.F.	-0.009	-1.155	0.231	1.636	0.019	291
ICB AMCL 2nd NRB M.F.	0.014	0.554	0.994	2.054**	0.029	291
Grameen One: Sch. Two	-0.001	-0.268	0.374	8.944***	0.362	291
Prime Finance First M.F.	-0.002	-0.286	0.128	1.038	0.008	291
EBL First Mutual Fund	-0.002	-0.523	0.246	4.315***	0.117	291
ICB AMCL Second M.F.	-0.010	-1.354	0.221	1.576	0.017	291
ICB Employees Provident MF One: Sch. One	-0.002	-0.406	0.096	0.889	0.006	291
Trust Bank First M. F.	0.000	-0.032	0.328	7.549***	0.288	291
Prime Bank 1st ICB AMCL M.F.	-0.004	-0.943	0.065	0.885	0.006	291
DBH First Mutual Fund	0.000	-0.103	0.333	7.890***	0.306	291
IFIC Bank 1st Mutual Fund	-0.001	-0.406	0.263	9.246***	0.417	291
Phoenix Finance 1st MF	-0.003	-0.790	0.120	1.547	0.097	291

Note. *** Significance at 1% level; ** 5% level; and * 10% level.

5.4. Regression Analysis for Testing Market Timing Skill

Market timing skill implies the fund manager's ability to estimate the market movement correctly. As we referred earlier that we applied two models; one was developed by Treynor and Mazuy [24] and the other was developed by Henriksson and Merton [10] to facilitate checking the market timing skill of fund managers in Bangladesh. Table 4 reports the regression results of the Treynor and Mazuy [24] model. The value of gamma of the model is the gauge of testing market timing skill of fund managers. The positive value of gamma indicates timing in right direction while the negative value means wrong direction. In Table 4, nearly all the funds' gamma estimates are negative and none of the t-value of gamma estimate is statistically significant at 10% level. In particular, out of 25 funds, only 3 funds' gamma values are positive, but having no statistical significance. Therefore, applying Treynor and Mazuy [24] method it is evidenced that none of the funds' managers happen to able timing the market correctly.

Table 4. Regression results of Treynor & Mazuy (1966) Model

Name of the Mutual Funds	Alpha	Beta	Gamma	t(Alpha)	t(Beta)	t(Gamma)	R^2
1st ICB M.F.	-0.033	0.224	-1.234	-0.409	1.732	-0.987	0.030
2nd ICB M.F.	-0.013	0.337	-1.259	-0.360	2.316**	-0.920	0.048
3rd ICB M.F.	-0.009	0.330	-1.274	-0.371	2.315**	-0.956	0.049
4th ICB M.F.	-0.002	0.258	-1.174	-0.473	1.936*	-0.886	0.036
5th ICB M.F.	-0.005	0.272	-1.403	-0.352	1.872*	-1.047	0.037
6th ICB M.F.	0.007	0.389	-1.576	0.334	1.392	-0.572	0.018
7th ICB M.F.	-0.004	0.267	-1.345	-0.332	1.936*	-0.983	0.038
8th ICB M.F.	-0.003	0.297	-1.214	-0.382	2.034**	-0.900	0.039
1st BSRS	-0.005	0.729	-0.430	-0.424	5.653***	-0.349	0.194
Aims 1st M.F	0.083	0.779	-6.982	1.289	0.677	-0.634	0.007
ICB AMCL 1st M.F.	-0.006	0.182	-1.081	-0.831	1.241	-0.772	0.018
ICB AMCL Islamic M.F.	-0.006	0.183	-1.087	-0.667	1.198	-0.743	0.017
Grameen M.F. one	-0.003	0.470	0.163	-0.685	6.481***	0.240	0.234
ICB AMCL 1st NRB M.F.	-0.005	0.221	-1.184	-0.654	1.468	-0.863	0.024
ICB AMCL 2nd NRB M.F.	-0.002	1.089	5.484	-0.019	2.223**	1.170	0.038
Grameen One: Sch. Two	-0.001	0.387	0.170	-0.445	8.863***	0.419	0.363
Prime Finance First M.F.	0.003	0.099	-1.668	0.359	0.795	-1.394	0.021
EBL First Mutual Fund	-0.001	0.244	-0.123	-0.370	4.204***	-0.222	0.117
ICB AMCL Second M.F.	-0.007	0.201	-1.172	-0.844	1.409	-0.860	0.022
ICB Employees Provident MF One: Sch. One	0.001	0.072	-1.411	0.239	0.655	-1.345	0.018
Trust Bank First M. F.	0.000	0.325	-0.121	0.098	7.372***	-0.286	0.288
Prime Bank 1st ICB AMCL M.F.	-0.001	0.046	-1.099	-0.168	0.620	-1.543	0.022
DBH First Mutual Fund	0.000	0.330	-0.154	0.074	7.693***	-0.374	0.307
IFIC Bank 1st Mutual Fund	0.000	0.259	-0.220	-0.022	8.973***	-0.796	0.380
Phoenix Finance 1st MF	-0.001	0.104	-0.953	-0.160	1.318	-1.266	0.028

Note. *** Significance at 1% level; ** 5% level; * 10% level;'t' indicates t-statistics & Total observation =143.

Table 5. Regression results of Henriksson & Merton (1981) Model

Name of the Mutual Funds	Alpha	Beta	Gamma	t(Alpha)	t(Beta)	t(Gamma)	R^2
1st ICB M.F.	0.004	0.454	-0.509	0.308	2.164**	-1.305	0.021
2nd ICB M.F.	0.003	0.544	-0.454	0.202	2.409**	-1.077	0.037
3rd ICB M.F.	0.004	0.554	-0.494	0.273	2.518**	-1.204	0.039
4th ICB M.F.	0.003	0.478	-0.464	0.163	2.208**	-1.126	0.026
5th ICB M.F.	0.005	0.536	-0.588	0.411	2.411**	-1.415	0.030
6th ICB M.F.	0.011	0.615	-0.439	0.438	1.350	-0.515	0.004
7th ICB M.F.	0.006	0.541	-0.590	0.429	2.426**	-1.390	0.031
8th ICB M.F.	0.003	0.512	-0.501	0.278	2.328**	-1.196	0.030
1st BSRS	0.002	0.864	-0.310	0.150	4.286***	-0.810	0.185
Aims 1st M.F	0.127	2.195	-3.173	1.447	1.221	-0.928	-0.004
ICB AMCL 1st M.F.	-0.001	0.398	-0.483	-0.085	1.738*	-1.109	0.008
ICB AMCL Islamic M.F.	0.002	0.438	-0.578	0.170	1.838*	-1.275	0.010
Grameen M.F. one	-0.004	0.428	0.071	-0.685	3.858***	0.334	0.223
ICB AMCL 1st NRB M.F.	0.001	0.440	-0.512	0.087	1.966**	-1.202	0.015
ICB AMCL 2nd NRB M.F.	-0.029	0.069	2.266	-0.758	0.091	1.559	0.032
Grameen One: Sch. Two	-0.002	0.346	0.070	-0.585	5.195***	0.551	0.354
Prime Finance First M.F.	0.009	0.368	-0.587	0.958	1.885*	-1.581	0.011
EBL First Mutual Fund	0.000	0.285	-0.096	0.051	3.146***	-0.559	0.106
ICB AMCL Second M.F.	-0.001	0.414	-0.472	-0.112	1.860*	-1.116	0.012
ICB Employees Provident MF One: Sch. One	0.005	0.251	-0.378	0.566	1.459	-1.156	0.001
Trust Bank First M. F.	0.001	0.354	-0.064	0.335	5.123***	-0.488	0.279
Prime Bank 1st ICB AMCL M.F.	0.002	0.193	-0.313	0.383	1.654*	-1.411	0.005
DBH First Mutual Fund	0.002	0.382	-0.120	0.617	5.701***	-0.941	0.301
IFIC Bank 1st Mutual Fund	0.001	0.307	-0.108	0.646	6.821***	-1.265	0.376
Phoenix Finance 1st MF	0.002	0.230	-0.268	0.294	1.862*	-1.142	0.012

Note. *** Significance at 1% level; ** 5% level; * 10% level;'t' indicates t-statistics & Total observation =143.

Table 5 presents the regression results of the Henriksson and Merton [10] model. In accordance with the Treynor and Mazuy [24] model, the gamma of this model is also the measure of testing market timing skill and the same decision rule will also be applicable here. The Henriksson and Merton [10] model produces almost the same results as the Treynor and Mazuy [24] model did earlier. Out of 25 funds, only 3 funds' gamma values are positive, but having no statistical significance at 10% level. Thus, both models evidences that no market timing ability for fund's managers is persistent in Bangladesh. The results are consistent with Treynor and Mazuy [24], Kon and Jen [15], Jiang [13] and Miglani [17] who also found no evidence for market timing ability of fund managers. Indeed, very few researchers in the world found the persistence of market timing skill of fund managers, but selection skill is commonly evidenced.

6. Conclusions

In this study, we inspected the ability of fund managers to outguess the market in Bangladesh. We investigated both selection and market timing skills to check the aptitude of fund managers to outguess the market. We found evidence that unlike Aims 1st M.F, ICB AMCL 2nd NRB M.F. and 6th ICB M.F., most of the fund managers can show neither skill. The three funds' managers; Aims 1st M.F, ICB AMCL 2nd NRB M.F. and 6th ICB M.F; become able to show their assets selection skill, but fail to demonstrate market timing skill. Out of the six risk-adjusted measures most of the measures ranked these three funds top and even ahead of benchmark index. In addition, unlike these three funds, all have negative value of alpha evidencing that fund managers have no selection skill and even they pool wrong assets into their portfolios. Even though, three funds' gamma values are positive in both models, but having no statistical significance. Thus, with a few exceptions, we can conclude that neither skill is persistent to the funds' managers in Bangladesh. This result is not surprising as the market is straggling since the early 2011 due to market turmoil. Most of the stocks' price goes down very sharply just after 2010, which is still continuing. But, this reason cannot give comfort to the fund managers to conceal their ineptness in assets management of their portfolio. More researches are welcome with updated data and methodology to unfold the causes of poor performance of fund managers. Researchers are also suggested to include more variables in their researches in order to get more vibrant results in this regard.

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