

Performance Evaluation of Mutual Fund Sector in Bangladesh, and Identification of Major Drawbacks

Md. Habibur Rahman & Abdullah Al Mamun

Abstract

This study focuses on the performance evaluation of the selected mutual funds listed in Dhaka Stock Exchange Limited, Bangladesh, and also attempts to identify the main drawbacks of this sector. Sharpe ratio, Treynor ratio, Jensen Alpha, M2, and Information ratio have been employed as performance evaluation tools. Total risk and systematic risk of the funds are examined separately. A measure of active return and excess return over a risk-free rate is also made in this study. Fama performance measure is used in detail to evaluate the skill of fund managers. This study covers the period from February 2013 to December 2021 (107 months). The study revealed that most of the funds failed to outperform the benchmark during the period. The fund managers had shown good selection skills when the market was bearish but when the market was normal or bullish, they had showed poor selection skill. Among many reasons' Imperfect definition of mutual fund in Bangladesh seems to be the main reason behind their poor performance.



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1.0 Introduction

Over the past decade, mutual funds have gained tremendous importance as a choice for long-term investing. Each mutual fund has its own risk-return objective. So mutual funds can offer investors a wide range of choices with regard to risk-return preference. It is one of the most preferred investment alternatives for risk-averse investors. After the development of theories relating to portfolios and the Capital Asset Pricing Model (CAPM), the performance analysis of mutual funds has been increased greatly and investors' interest in investing in mutual funds has also increased. Over the past few decades, the market value of mutual funds in Bangladesh has also increased dramatically. Any company that pools money from many investors and uses the funds for investing in shares, bonds, short-term money market instruments, other securities, or assets is referred to as mutual fund. It offers various benefits to the investors such as diversification, cost efficiency, professional service, tax benefits, etc. It is very easy for large investors to invest their money in a diversified pool of securities for having a large amount of funds and professional management skills. But small investors are unable to diversify their investment with the limited fund. For these reasons, the small investor can take the advantage of investing in a well-managed diversified pool of investment with low cost by investing in mutual funds. With the emphasis on an increase in investment through capital markets, the need and scope for mutual fund operation have increased to a great extent.-Today it is much relevant to study the performance of the mutual fund industry from various dimensions. This is greatly needed in order to promote this industry and create confidence among investors. This will also help to identify the drawbacks. This study shows the present state of mutual funds, their structure and operation system in Bangladesh, and the overall performance and drawbacks of mutual funds in Bangladesh.

1.1 Literature Review

Some empirical studies attempted to analyze the mutual fund sector of Bangladesh in recent past. Jakaria & Nusrat (2020) had made a study titled 'Performance Evaluation of Mutual Funds in Bangladesh'. In this study they have analyzed the performance of 29 close-ended mutual funds of Bangladesh. They have tried to indicate that performance of mutual funds depends on the Fund manager's performance. Their analysis was based on Sharpe ratio, Treynor ratio, Jensen's Alpha, and M^2 Alpha. Quazi & Dr. Siraj (2019) had made a study titled 'Performance of Mutual Funds Management of Bangladesh-Evidence from Close End Mutual Funds in Dhaka Stock Exchange Limited (DSE)'. This study analyzed the performance of close end mutual fund and compared it with the performance of open end mutual fund. Biplob (2017) had made a study titled 'Performance Evaluation of Bangladeshi Mutual Fund: An Analysis of Monthly Return Based on Net Asset Value'. This study provided a glimpse of Bangladeshi mutual fund industry and showed the performance of mutual funds in terms of risk adjusted performance models. Tasruma, Habibullah & Nahar (2018) had conducted a study titled 'Risk and Return Analysis of Closed-End Mutual Fund in Bangladesh'. This study assessed the performance of 24 close-end mutual funds based on both market price and net asset value (NAV). Qamruzzaman (2014) had made a study titled 'Comparative Study on Performance Evaluation of Mutual Fund Schemes in Bangladesh: An Analysis of Monthly Returns. In his paper, he evaluated the performance of 32 growth-oriented mutual funds in Bangladesh. He used Sharpe Index, Treynor Index, and Jensen Alpha as performance evaluation tools. Prajapati & Patel (2012) had made a study titled 'Comparative Study on Performance Evaluation of Mutual Fund Schemes of Indian companies. They carried out the study using relative performance index, risk-return analysis, Sharpe Index, Treynor Index, Jensen Alpha, and Fama's decomposition. The study found that from 2007 to 2011 most of the mutual funds have performed satisfactorily. Brown and Vickers's study on mutual fund's portfolio activity, performance, and market impact revealed that the performance of funds, on average, is nearly similar to the composite markets

from which fund investors select securities. The study shows that there is no link between variations in a fund's portfolio turnover rates and variations in performance where a fund's portfolio activity influences market prices; especially it affects individual securities in the short run. Anwar and Arif (2016) had made a study titled 'Evaluation of Mutual Funds Performance in Bangladesh: Investors and Market Perspective'. The performance of 31 mutual funds in Bangladesh based on weekly NAV and Weekly closing price was analyzed in this paper. Sharpe Index, Treynor Index, and Jenson Alpha are used as performance evaluation tools in this study. The research period for the study was June 2014-2016. This study found that the selected mutual funds had performed poorly relative to the benchmark. Most of the funds showed large negative returns and a downward trend in comparison to the market return. Bhagyasree and Kishori (2016) had made a study titled 'A Study on Performance Evaluation of Mutual Funds Schemes in India'. They analyzed the performance of open-ended, growth-oriented equity funds of India for the period from April 2011 to March 2015. Sharpe Index, Treynor Index, and Jenson Alpha are used as performance evaluation tools in this study. This paper shows that most of the funds had attained a positive Sharpe ratio, Treynor ratio, and Jenson alpha. Das (2016) had made a study titled 'Performance of Mutual Funds: The Case of Bangladesh'. This paper made an evaluation of mutual funds in Bangladesh for a period from July 1, 2012, to June 30, 2015. Sharpe Index, Treynor Index, and Jenson Alpha are used as performance evaluation tools in this study. This paper states that most of the funds outperform the market by ensuring abnormal positive returns. Gandhi and Perumal (2017) had made a study titled 'Mutual fund financial performance analysis- (comparative study on equity diversified schemes and equity mid-cap schemes)'. In this paper, they analyzed the financial performance of some mutual fund schemes of selected banks in India. They used Sharpe Index, Treynor Index, Jenson Alpha, and Information Ratio to analyze the performance. This paper made a comparative analysis and made a conclusion with regard to which fund performed better. Goel, Mani & Sharma (2012) had made a study titled 'A review of performance indicators of mutual fund'. This study attempted to identify the performance indicators of mutual funds and their impact on performance. They studied the impact of turnover, expense ratio, asset size, investment style, the ownership style on performance.

1.2 Objective of the study

Broad objective

The broad objective of this study is the measurement of the performance and evaluation of the risk-return relationship of mutual funds listed in Dhaka Stock Exchange Ltd. (DSE), Bangladesh.

Other objectives

- i. To evaluate the performance of selected mutual funds listed in DSE, Bangladesh by using various portfolio performance evaluation tools.
- ii. To evaluate the overall performance of the fund by decomposing the return into selection and risk
- iii. To examine the selection skill of the fund managers.
- iv. To identify the major drawbacks of the mutual fund industry in Bangladesh

1.3 Research Methodology

Various portfolio performance evaluation tools namely Sharpe Index, Treynor Index, Jensen Alpha, and M2 and Information Ratio have been applied to analyze and interpret the research outcome accordingly. To examine the mutual fund's performance, 15 closed-end mutual funds have been selected among the 34 listed in Dhaka Stock Exchange Ltd. Mutual funds which are traded about at least for the last five years in the market are considered in this study. Data covers from 1st February 2013 to 31st December 2021 (107 months). The weekly closing price

and Monthly NAV of the fifteen funds have been used in this study. 364 days T-bill rates have been used as risk-free rates. DSEX index is used as the benchmark index. Data regarding closing prices were collected from investing.com. Monthly NAV data were collected from amarstock.com. 364 days T-bill rates were collected from the Bangladesh Bank website.

1.4 Tools and techniques used

a) Sharpe ratio: It indicates the risk-return performance of the portfolio.

$$\text{Sharpe Ratio} = (R_p - R_f) / \sigma_p$$

Where,

R_p = Portfolio Return

R_f = Risk-Free Rate of Return

σ_p = Standard Deviations of the Portfolio Return

b) Treynor ratio: It measures the excess returns which are earned on investments that have no diversifiable risk.

$$\text{Treynor Ratio} = (R_p - R_f) / \beta_p$$

Where,

R_p = Portfolio Return

R_f = Risk-Free Rate of Return

β_p = Beta Coefficient of Portfolio

c) Jensen measure: It measures the risk-adjusted performance of a security or portfolio in relation to the expected market return.

$$\text{Alpha } (\alpha) = R_p - \{R_f + (R_m - R_f)\}$$

Where,

R_p = Portfolio Return

R_f = Risk Free Rate of Return

R_m = return on market/benchmark portfolio

β_p = Beta Coefficient of Portfolio

d) Information Ratio: It measures the portfolio's average return in excess of benchmark return divided by the tracking error.

$$\text{Information Ratio} = (R_p - R_m) / \sigma_{ER}$$

Where,

R_p = Portfolio Return

R_m = return on market/benchmark portfolio

σ_{ER} = Standard Deviations of the excess return/tracking error

e) M2: M2 measures what the fund would have returned if it had taken the same total risk as the market index.

$$M2 = R_f + ((R_p - R_f) / \sigma_p) * \sigma_m$$

Where,

R_p = Portfolio Return

R_f = Risk-Free Rate of Return

σ_p = Standard Deviations of the Portfolio Return

σ_m = Total market risk

f) Fama decomposition: Fama (1972) says that the overall performance of a portfolio in excess of risk-free rate can be decomposed into risk-taking and selection skill.

Overall performance = $R_p - R_f = \text{Portfolio Risk} + \text{Selectivity}$

Return due to selectivity = $R_p - \beta_p * R_m$

Where,

R_p = Portfolio Return

$\beta_p * R_m$ = Return of the benchmark portfolio that has risk β_x equal to β_p

Return due to risk = $\beta_p * R_m - R_f$

Where,

R_f = Risk-Free Rate of Return

$\beta_p * R_m$ = Return of the benchmark portfolio that has risk β_x equal to β_p

Selectivity measures can further be divided into net selectivity and diversification. Net selectivity measures the return that is added to the portfolio due to selecting undervalued securities and giving up some diversification.

Diversification Component = $R_m * \sigma_p - \beta_p * R_m$

Net selectivity = Selectivity - Diversification = $R_p - R_m * \sigma_p$

Where,

$R_m * \sigma_p$ = Return of the benchmark portfolio that has risk equal to σ_p

1.5 Limitations of the Study

- This study only focuses on 15 closed-end mutual funds out of 34 listed in Dhaka Stock Exchange Ltd.(DSE) due to the unavailability of adequate data.
- The period of study is restricted to 107 months starting from 1st February 2013 to 31st December 2021 for evaluating the performance of selected mutual funds but not from their commencement.
- This paper only considers monthly net asset value (NAV) to evaluate the performance of the selected mutual funds.
- The study is limited only to the Bangladeshi mutual fund industry.

2.0 Mutual fund industry of Bangladesh

ICB first mutual fund launched by Investment Corporation of Bangladesh (ICB) in 1980 was the first mutual fund in Bangladesh. ICB subsequently offered various closed-end mutual funds. The first private attempt of initiating a mutual fund was Asset & Investment Management Services of Bangladesh Limited (AIMS) in 1999. Currently, 34 closed-end mutual funds and 75 open end mutual funds are traded in the secondary market.

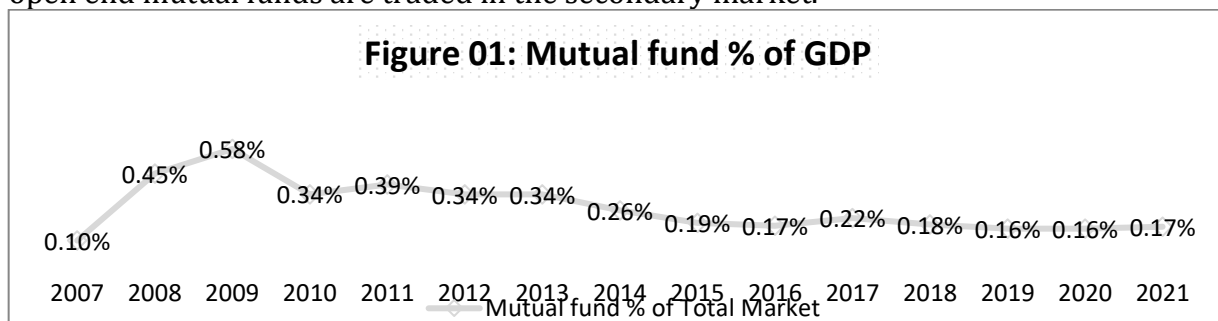


Figure 01 shows the mutual fund industry size as a percentage of GDP over a period of fifteen years. All the above data have been calculated by dividing the Mutual fund market Capitalization by the Total GDP of the Country for each year. The size of this industry is very insignificant in all the years. In the fiscal year 2021, it is 0.17% representing an increase from the previous year.

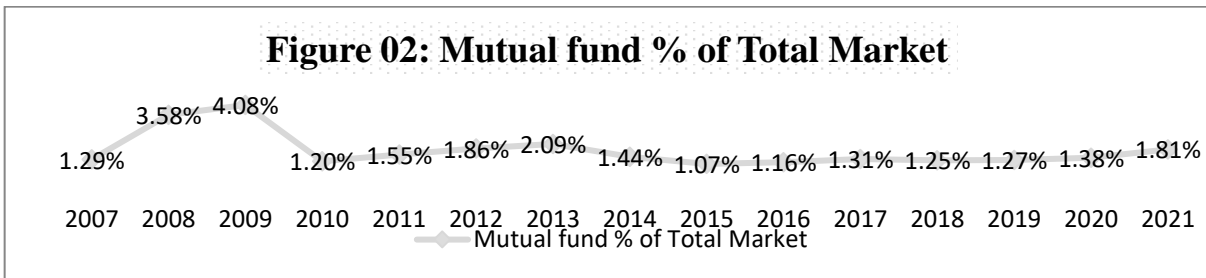


Figure 02 shows the size of the mutual fund industry as a percentage of total market capitalization. All the above data have been calculated by dividing the Mutual fund market Capitalization by Total Market Capitalization for each year. This graph shows that mutual fund has a very insignificant place in the capital market. In 2021 it has 1.81% of market capitalization. In 2007 the percentage was 1.29%.

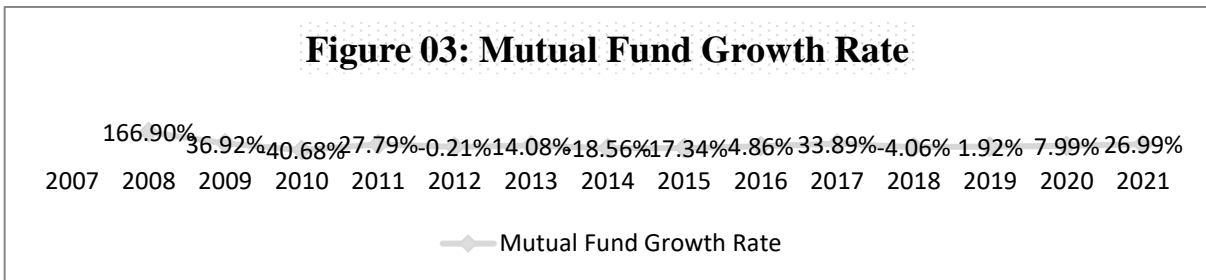
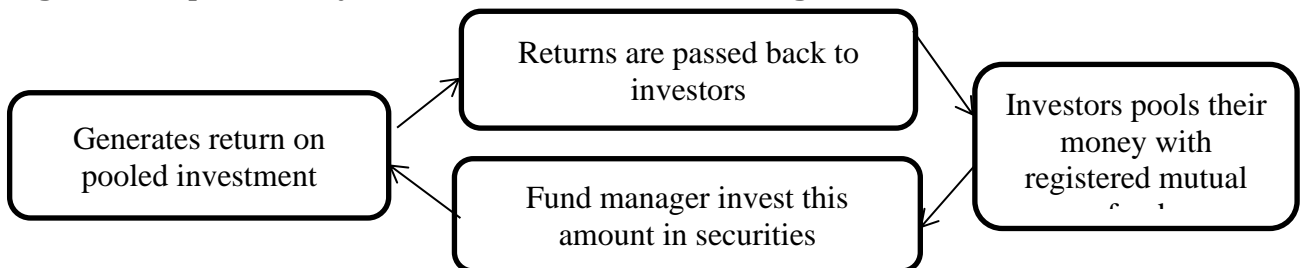


Figure 03 shows the growth rate of the mutual fund industry of Bangladesh over a period of fourteen years, from 2007-08 to 2020-21. All the above data have been calculated by indicating the growth of Mutual Fund Market Capitalization from its previous year. After 2007-08 there was a steep decline in the industry. From 2010-11 to 2020-21 there was much fluctuation in the growth rate. Mutual fund industry of Bangladesh is in infant stage. The growth and significance of this industry is little partly due to poor capital market. However this industry is becoming a phenomenon day by day. New investors and institutional investors have significant interest in mutual fund.

2.1 Operation System of Mutual Fund

A mutual fund company accumulates savings from distant investors and put them in securities. This fund is managed by professionals who has a good understanding of the market and tries to achieve the stated objective of the fund. Investors in mutual fund shares the return from investing their raised capital. The AMC is accountable for dealing with the investment processes. It also provides other services like consultation client support, information management, marketing and sales jobs for the mutual fund.

Figure 04: Operation System of Mutual Fund according to BSEC rules.



2.2 Structure of Mutual Fund

To construct a mutual fund a sponsor, a trustee, and an Asset Management Company are required. The trust is made by a sponsor, who acts as the promoter of a company. The mutual

fund will be listed within the BSEC (Bangladesh Security Exchange Commission). All the properties of a mutual fund remain under the custody of a trustee. An Asset Management Company (AMC) takes care of the fund by investing in different types of securities that have to be approved by the Bangladesh Securities & Exchange Commission (BSEC). For administering and directing the AMC several trustees are assigned by BSEC. They ensure the smooth operation of the mutual fund according to BSEC rules and regulations. All the administrative authority and dominance are assigned to the Trustee.

3.0 Performance Analysis of Mutual Funds

3.1 Risk Calculation

3.1.1 Total Risk

Standard deviation (STD) of return measures the total risk of a fund. The higher this measure the higher the volatility or risk.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
Market	0.56	1.04	0.37	0.47	0.34	0.40	0.73	0.59	0.80
1JANATAMF	0.53	0.53	0.15	0.54	0.29	0.21	0.50	0.50	0.51
1STPRIMFMF	0.88	1.48	0.76	0.60	0.48	0.47	0.82	0.72	1.32
AIBL1STIMF	0.45	0.46	0.50	0.29	0.28	0.43	0.58	0.37	3.23
DBH1STMF	0.88	1.48	0.43	0.37	0.25	0.23	0.58	0.35	0.55
EBL1STMF	0.51	0.54	0.22	0.53	0.31	0.32	0.64	0.39	0.71
EBLNRBMF	0.33	0.61	0.12	0.47	0.31	0.20	0.49	0.38	0.68
GRAMEENS2	0.39	0.68	0.66	0.35	0.27	0.37	0.53	0.40	0.77
GREENDELMF	0.34	0.83	0.43	0.37	0.25	0.19	0.42	0.30	0.48
ICB3RDNRB	0.63	1.35	0.54	0.43	0.38	0.37	0.60	0.55	1.02
IFIC1STMF	0.38	0.63	0.11	0.45	0.31	0.25	0.57	0.34	0.69
IFILISLMF1	0.57	1.08	0.62	0.45	0.34	0.51	0.50	0.53	0.91
PHPMF1	0.36	0.57	0.13	0.51	0.29	0.24	0.47	0.45	0.52
POPULAR1MF	0.41	0.57	0.15	0.48	0.33	0.24	0.49	0.41	0.46
SEBL1STMF	0.33	0.81	0.44	0.32	0.42	0.50	0.44	0.39	0.39
TRUSTB1MF	0.41	0.55	0.21	0.57	0.27	0.24	0.51	0.41	0.76

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 01 depicts the annual STD of the selected mutual fund and of the market. Market Risk have been calculated by multiplying the monthly STD of market return with 12. These data shows that market was highly volatile in 2013 and 2015. The market was comparatively less volatile in 2019, 2020 and 2021 respectively with compared to other year's volatility. 1STPRIMFMF seems to be the most volatile mutual fund among the selected mutual funds. It has the highest standard deviation in all the years except 2013 and 2016. ICB3RDNRB, IFILISLMF1 and AIBL1STIMF have also high volatility. 1JANATAMF, DBH1STMF, EBLNRBMF, EBL1STMF, IFIC1STMF, GREENDELMF, PHPMF1, SEBL1STMF, POPULAR1MF and TRUSTB1MF seem to have risk almost identical to market risk. AIBL1STIMF seems to have the highest volatility here which is 3.13 in 2013. But it has reduced tremendously from 2014. GRAMEENS2 has higher volatility in 2021 than previous years.

3.1.2 Systematic Risk

Beta measures the systematic risk of a fund that cannot be eliminated through diversification. It indicates the sensitivity of a stocks return to market return. The higher is the beta higher the sensitivity or systematic risk.

In the below table we can see that the mutual funds were highly volatile in 2013, 2014, 2016 and 2017 respectively. It has the lowest volatility in 2015. In 2016 both the 1STPRIMFMF and TRUSTB1MF have a volatility of 2.58 and 2.21 which indicates these two mutual funds were highly price sensitive to market in 2016. In 2019 both the AIBL1STIMF and EBL1STMF have negative beta that is -0.28 and -0.17 which indicates that these two funds is not much price sensitive to market in 2019 as they have lower systematic risk.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
1JANATAMF	1.27	0.05	0.97	0.71	1.40	1.00	0.59	1.13	1.06
1STPRIMFMF	1.60	1.09	0.88	1.03	1.96	2.58	0.63	0.80	1.18
AIBL1STIMF	1.18	0.08	-0.28	0.48	1.36	1.06	0.29	1.05	0.86
DBH1STMF	0.35	0.15	0.36	0.66	0.48	1.03	0.57	1.00	1.33
EBL1STMF	0.92	0.02	-0.17	1.06	0.99	0.72	0.92	0.68	0.94
EBLNRBMF	1.20	0.13	0.83	0.98	1.02	1.62	0.97	1.32	0.43
GRAMEENS2	0.97	0.43	0.76	0.49	0.87	0.62	0.97	0.93	1.28
GREENDELMF	0.48	0.49	0.19	0.72	0.49	0.79	0.54	1.17	1.02
ICB3RDNRB	0.84	0.42	0.89	0.45	1.81	0.83	0.34	1.03	0.72
IFIC1STMF	1.44	0.01	1.06	0.65	1.13	0.73	0.88	1.09	1.18
IFILISLMF1	0.72	0.23	0.85	0.36	1.11	1.08	1.21	1.05	1.01
PHPMF1	1.21	0.44	0.94	0.76	1.21	0.99	0.42	1.13	1.18
POPULAR1MF	1.06	0.52	1.33	0.86	1.46	0.71	0.49	1.19	1.18
SEBL1STMF	0.14	0.27	0.99	0.04	0.30	0.40	0.38	0.67	0.77
TRUSTB1MF	1.06	0.16	0.93	1.13	1.31	2.21	0.57	0.89	1.30

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Among all the selected mutual funds SEBL1STMF has the low sensitivity to the market which is below 1 in all the years and IFILISLMF1 has the high sensitivity. EBL1STMF, GRAMEENS2, GREENDELMF and ICB3RDNRB have identical systematic risk. 1JANATAMF, 1STPRIMFMF, AIBL1STIMF, DBH1STMF, EBLNRBMF, IFIC1STMF, IFILISLMF1, PHPMF1, POPULAR1MF and TRUSTB1MF have higher sensitivity in most of the years.

3.2 Return Profile

3.2.1 Annual Return

The annual return is the return that an investment provides over a period of time, expressed as a time-weighted annual percentage.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
Market	18.42%	14.54%	-24.38%	-12.51%	14.48%	11.29%	-2.79%	2.54%	8.55%
1JANATAMF	-3.99%	5.35%	-13.60%	-13.00%	0.27%	-0.10%	1.12%	3.10%	12.09%
1STPRIMFMF	16.77%	14.64%	-42.27%	-17.76%	-6.05%	6.23%	-10.71%	-8.60%	-9.00%
AIBL1STIMF	-5.17%	20.44%	-14.43%	-13.34%	5.12%	-7.33%	18.23%	-7.35%	7.78%
DBH1STMF	16.77%	14.64%	-15.91%	-19.30%	13.76%	1.47%	8.70%	-5.93%	8.31%
EBL1STMF	-4.10%	5.53%	-15.29%	-14.79%	1.38%	0.21%	5.07%	-5.27%	-10.33%
EBLNRBMF	7.65%	7.30%	-11.08%	-13.13%	1.38%	0.83%	1.68%	-7.33%	-3.67%
GRAMEENS2	3.91%	12.52%	-17.37%	-11.56%	8.92%	1.53%	-12.55%	1.84%	12.85%
GREENDELMF	-3.86%	-31.39	-17.08%	-20.09%	14.38%	2.19%	2.97%	-0.32%	7.89%
ICB3RDNRB	14.65%	21.23%	-31.90%	-23.39%	-6.75%	1.68%	-3.88%	-2.48%	5.55%
IFIC1STMF	-2.20%	6.99%	-12.70%	-12.14%	-1.00%	0.62%	-1.65%	-2.32%	-4.39%
IFILISLMF1	10.16%	15.93%	-28.15%	-21.72%	-6.03%	0.12%	-4.03%	-2.34%	20.47%
PHPMF1	0.67%	5.26%	-11.87%	-14.98%	1.11%	-0.94%	3.05%	-3.16%	11.19%
POPULAR1MF	-1.15%	3.48%	-12.17%	-12.06%	-0.20%	-0.51%	-1.62%	-1.10%	7.83%
SEBL1STMF	-9.55%	10.65%	-16.43%	-23.27%	15.49%	7.38%	-0.18%	6.82%	1.07%
TRUSTB1MF	0.56%	8.62%	-16.49%	-14.79%	1.67%	2.00%	1.43%	-6.18%	-3.80%

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 03 shows the annual return of the market and the selected mutual funds for the period from 2013 to 2021. The market return was negative in 2019, 2018 and 2015. It indicates that market was bearish in 2019, 2018 and 2015. There is a negative return in 2019 and 2018 respectively in all the mutual funds. That indicates that the management system for mutual funds may be poor, or there could be some other factors that are beyond control. Market showed better performance in 2020 and 2021 respectively. In 2017 only SEBL1STMF had generated a return above the market return. In 2016, no funds were able to generate a return above the market return and 1JANATAMF, AIBL1STIMF, PHPMF1, POPULAR1MF have negative returns. In 2015, 1JANATAMF, AIBL1STIMF, DBH1STMF, EBL1STMF, EBLNRBMF, GREENDELMF, PHPMF1 and TRUSTB1MF had generated a return above the market return and AIBL1STIMF has the highest return. In 2014 only 1JANATAMF and SEBL1STMF had generated a return above the market return. In 2013, only 1JANATAMF, GRAMEENS2 and IFILISLMF1 had surpassed the market return.

3.2.2 Active Return

Active return measures the return of a mutual fund in excess of market return. It indicates by how much the mutual fund is rewarded due to actively managing the portfolio.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
1JANATAMF	-22.41%	-9.19%	10.78%	-0.49%	-14.21%	-11.39%	3.91%	0.56%	3.55%
1STPRIMFMF	-1.65%	0.10%	-17.88%	-5.25%	-20.53%	-5.06%	-7.93%	-11.14%	-17.54%
AIBL1STIMF	23.59%	5.89%	9.95%	-0.83%	-9.36%	-18.62%	21.02%	-9.88%	-0.76%
DBH1STMF	-1.65%	0.10%	8.48%	-6.79%	-0.72%	-9.83%	11.48%	-8.47%	-0.23%
EBL1STMF	-22.52%	-9.01%	9.09%	-2.28%	-13.10%	-11.08%	7.85%	-7.80%	-18.87%
EBLNRBMF	-10.77%	-7.24%	13.31%	-0.63%	-13.10%	-10.46%	4.47%	-9.87%	-12.22%
GRAMEENS2	-14.52%	-2.02%	7.02%	0.94%	-5.56%	-9.76%	-9.76%	-0.70%	4.30%
GREENDELMF	-22.28%	-45.93%	7.30%	-7.59%	-0.10%	-9.10%	5.76%	-2.86%	-0.66%
ICB3RDNRB	-3.77%	6.69%	-7.52%	-10.89%	-21.23%	-9.61%	-1.09%	-5.02%	-2.99%
IFIC1STMF	20.62%	-7.55%	11.68%	0.36%	-15.48%	-10.67%	1.14%	-4.86%	-12.94%
IFILISLMF1	-8.27%	1.39%	-3.77%	-9.22%	-20.51%	-11.18%	-1.24%	-4.87%	11.93%
PHPMF1	-17.75%	-9.28%	12.51%	-2.48%	-13.37%	-12.23%	5.84%	-5.70%	2.64%
POPULAR1MF	-19.57%	-11.07%	12.21%	0.45%	-14.68%	-11.80%	1.17%	-3.64%	-0.72%
SEBL1STMF	-27.97%	-3.89%	7.95%	-10.77%	1.01%	-3.91%	2.61%	4.28%	-7.47%
TRUSTB1MF	-17.86%	-5.92%	7.89%	-2.29%	-12.81%	-9.29%	-6.74%	-8.71%	-12.34%

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 04 depicts the annual active return of the selected mutual fund for the period from 2013 to 2021. Negative returns are colored dark red in the table. In 2021 all the selected mutual fund have generated negative active returns except AIBL1STIMF and IFIC1STMF also in 2019 all the selected mutual funds have generated positive active returns except 1STPRIMFMF, ICB3RDNRB and IFILISLMF1. In 2018 all the selected mutual funds had generated negative active returns except GRAMEENS2, IFIC1STMF and POPULAR1MF. In 2017 only SEBL1STMF had positive active return. In 2016 all the selected mutual funds had generated negative active return. In 2015 all the selected funds had positive active returns except 1STPRIMFMF, GRAMEENS2, ICB3RDNRB, TRUSTB1MF and IFILISLMF1. In 2014 only 1JANATAMF and SEBL1STMF was able to surpass the market. And in 2013 only 1JANATAMF, GRAMEENS2, IFILISLMF1 and PHPMF1 had positive active returns. Among the selected mutual funds, no funds have constancy in generating positive active return.

4.0 Sharpe Ratio

The Sharpe ratio is a risk-adjusted measure of performance developed by William Sharp for evaluating the performance of a portfolio and the portfolio manager. The Sharp ratio uses standard deviation to measure total risk of a portfolio rather than to consider only the systematic risk summarized by beta factor. This ratio basically indicates risk premium return earned per unit of total risk. It compares the excess return over risk free rate to the total risk. The higher is the ratio the better the performance.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
Market	0.3145	0.0643	-0.7899	-0.3581	0.3201	0.1713	-0.1501	-0.1082	-0.0378
1JANATAMF	-0.1000	-0.0473	-1.1962	-0.3198	-0.1145	-0.2202	-0.1408	-0.1186	0.0107
1STPRIMFMF	0.1775	0.0460	-0.6153	-0.3674	-0.2009	0.0364	-0.2292	-0.2432	-0.1553
AIBL1STIMF	-0.1444	0.2745	-0.3789	-0.6110	0.0559	-0.2780	0.1741	-0.4444	-0.0116
DBH1STMF	0.1775	0.0460	-0.4763	-0.6297	0.4030	-0.1337	0.0090	-0.4315	-0.0583
EBL1STMF	-0.1048	-0.0424	-0.9023	-0.3593	-0.0698	-0.1345	-0.0488	-0.3687	-0.3078
EBLNRBMF	0.1920	-0.0091	-1.3146	-0.3718	-0.0705	-0.1826	-0.1330	-0.4245	-0.2245
GRAMEENS2	0.0690	0.0690	-0.3303	-0.4478	0.1969	-0.0804	-0.3912	-0.1781	0.0169
GREENDELMF	-0.1490	-0.4750	-0.5036	-0.6507	0.4249	-0.1189	-0.1230	-0.3071	-0.0755
ICB3RDNRB	0.2128	0.0990	-0.6757	-0.6378	-0.2736	-0.0765	-0.2002	-0.2101	-0.0591
IFIC1STMF	-0.0909	-0.0136	-1.4962	-0.3623	-0.1476	-0.1567	-0.1727	-0.3315	-0.2301
IFILISLMF1	0.1566	0.0751	-0.5296	-0.5752	-0.2796	-0.0853	-0.2420	-0.2120	0.0985
PHPMF1	-0.0163	-0.0452	-1.239	-0.3743	-0.0845	-0.2249	-0.1085	-0.2695	-0.0069
POPULAR1MF	-0.0581	-0.0770	-1.116	-0.3428	-0.1127	-0.2050	-0.1984	-0.2445	-0.0808
SEBL1STMF	-0.3320	0.0345	-0.4787	-0.8547	0.2854	0.0578	-0.1877	-0.0546	-0.2688
TRUSTB1MF	-0.0169	0.0141	-1.023	-0.3330	-0.0684	-0.1054	-0.1318	-0.3661	-0.2026

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 05 shows the Sharpe ratio of the selected mutual funds during 2013 to 2021. Dark red colored cells in the table indicate inferior performance. All the selected mutual fund performed poorly in 2019 and 2018 respectively as they had negative Sharpe ratio. In 2021, nine out of the fifteen selected funds performed poorly. Only GREENDELMF and DBH1STMF showed superior performance compared to the benchmark. In 2016, no funds outperformed the market in share measure among the selected mutual funds and only 1STPRIMFMF, SEBL1STMF have positive ratio. In 2015, only AIBL1STIMF and DBH1STMF outperformed the market in share measure but all other selected funds had performed poorly as they had negative sharpe ratio. In 2014 all the selected mutual funds performed very poorly as they had negative sharpe ratio. In 2013 only 1JANATAMF, GRAMEENS2, IFILISLMF1 had performed well above the benchmark index, all other funds had performed very poorly. So according to Sharpe measure all the selected funds performed poorly during 2013 and 2021.

4.1 Treynor Ratio

Treynor (1965) was the first researcher developing a composite measure of portfolio performance which is called Treynor ratio. It is the ratio of the risk premium to the volatility of the return measured by portfolio systematic risk (beta). This is why this ratio is commonly known as reward-to-volatility ratio. Treynor ratio provides a measure of excess return per unit of systematic risk (beta). The underlying assumption of the Treynor index is that a multi-asset portfolio diversifies unsystematic risk away and the relevant risk that remains is systematic risk (beta). Larger Treynor measure indicates better performance. All risk averse investors prefer to maximize this value.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
Market	0.1717	0.0669	-0.2886	-0.1676	0.1093	0.0679	-0.1096	-0.0643	-0.0300
1JANATAMF	-0.0412	-0.4713	-0.1864	-0.2415	-0.0234	-0.0462	-0.1190	-0.0518	0.0051
1STPRIMFMF	0.5387	0.0625	-0.5322	-0.2128	-0.0489	0.0067	-0.3015	-0.2208	-0.1739
AIBL1STIMF	-0.0544	1.5732	0.6719	-0.3668	0.0116	-0.1111	0.3414	-0.1549	-0.0437
DBH1STMF	0.4434	0.4473	-0.5713	-0.3574	0.2150	-0.0295	0.0093	-0.1497	-0.0244
EBL1STMF	-0.0582	-1.1612	1.1662	-0.1795	-0.0219	-0.0593	-0.0338	-0.2106	-0.2317
EBLNRBMF	0.0533	-0.0427	-0.1870	-0.1767	-0.0212	-0.0227	-0.0668	-0.1232	-0.3580
GRAMEENS2	0.0274	0.1076	-0.2885	-0.3241	0.0619	-0.0479	-0.2133	-0.0767	0.0102
GREENDELMF	-0.4642	-0.8028	-1.1236	-0.3362	0.2210	-0.0291	-0.0967	-0.0792	-0.0359
ICB3RDNRB	0.1595	0.3186	-0.4098	-0.6162	-0.0568	-0.0340	-0.3591	-0.1108	-0.0829
IFIC1STMF	-0.0239	-0.8554	-0.1624	-0.2534	-0.0404	-0.0532	-0.1111	-0.1033	-0.1351
IFILISLMF1	0.1237	0.3498	-0.3859	-0.7193	-0.2796	-0.0406	-0.1012	-0.1075	0.0883
PHPMF1	-0.0048	-0.0593	-0.174	-0.2534	-0.0202	-0.0550	-0.1213	-0.1071	-0.0030
POPULAR1MF	-0.0227	-0.0770	-0.125	-0.1887	-0.0257	-0.0705	-0.2013	-0.0846	-0.0314
SEBL1STMF	-0.7716	0.1055	-0.2111	-7.7247	0.4003	0.0728	-0.2196	-0.0319	-0.1365
TRUSTB1MF	-0.0065	0.0481	-0.226	-0.1678	-0.0144	-0.0113	-0.1183	-0.1712	-0.1182

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 06 shows the Treynor ratio of the selected mutual funds during 2013 to 2021. Dark red colored cells in the table indicate inferior performance. The performance of all mutual fund was poor in 2020 and 2021 respectively. In 2019 only EBL1STMF (1.1662) got the highest excess return over risk-free return (0.9975) for taking per unit of systematic risk (β) followed by AIBL1STIMF (0.6719) and all other selected mutual funds have negative ratio which indicates poor performance. In 2014 and 2018 all the selected mutual funds had negative Treynor Ratio got no excess return over risk free return for taking per unit of systematic risk. In 2017 DBH1STMF, GREENDELMF and SEBL1STMF showed superior performance relative to the market. The remaining funds performed poorly. In 2016 SEBL1STMF and 1STPRIMFMF performed very well and the remaining funds performed very poorly as they have negative Treynor Ratio. In 2015, AIBL1STIMF and DBH1STMF had superior performance and the other selected mutual funds had performed very poorly. In 2013, 1JANATAMF, GRAMEENS2 and IFILISLMF1 performed well in the market.

4.2 Jensen Alpha

Michael Jensen (1968) has introduced a portfolio performance measure called Jensen alpha also known as Jensen ratio. Jensen alpha represent the difference between the actual return of the portfolio and required return of the portfolio or expected return of the portfolio at a given level of systematic risk as measured by its beta. In case of Jensen's alpha underlying assumptions of Capital Asset Pricing Model (CAPM) holds true without being tested. It measures the return that is earned above the expected return. Positive Jensen alpha indicates a fund manager's ability to consistently select undervalued securities and earn higher risk premium.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
1JANATAMF	-27.05%	-2.86%	9.91%	-5.28%	-18.61%	-11.37%	-0.56%	1.42%	3.73%
1STPRIMFMF	-11.96%	-0.48%	-21.39%	-4.68%	-31.05%	-15.76%	-12.02%	-12.45%	-17.00%
AIBL1STIMF	-23.48%	12.05%	-27.03%	-9.56%	-13.31%	-19.06%	13.29%	-9.54%	-1.18%
DBH1STMF	9.51%	5.77%	-10.09%	-12.51%	5.02%	-10.03%	6.74%	-8.50%	0.75%
EBL1STMF	-21.15%	-2.46%	-24.66%	-1.26%	-13.02%	-9.21%	6.96%	-9.89%	-19.04%
EBLNRBMF	-14.21%	-1.40%	8.46%	-0.90%	-13.35%	-14.66%	4.15%	-7.78%	-13.94%
GRAMEENS2	-13.99%	1.77%	0.01%	-7.64%	-4.11%	-7.19%	-10.08%	-1.15%	5.13%
GREENDELMF	-13.35%	-42.51%	-16.02%	-12.21%	5.48%	-7.70%	0.69%	-1.74%	-0.59%
ICB3RDNRB	-1.02%	10.57%	-10.76%	-20.13%	-30.12%	-8.45%	-8.37%	-4.80%	-3.83%
IFIC1STMF	-28.17%	-0.92%	13.36%	-5.55%	-16.85%	-8.83%	-0.14%	-4.26%	-12.40%
IFILISLMF1	-3.46%	6.54%	-8.23%	-19.92%	-21.68%	-11.73%	1.01%	-4.54%	11.96%
PHPMF1	-21.36%	-5.52%	10.76%	-6.52%	-15.66%	-12.14%	-0.50%	-4.84%	3.20%
POPULAR1MF	-20.60%	-7.88%	21.77%	-1.82%	-19.70%	-9.84%	-4.46%	-2.41%	-0.16%
SEBL1STMF	-13.21%	1.02%	7.68%	-26.92%	8.68%	0.19%	-4.18%	2.19%	-8.17%
TRUSTB1MF	-18.89%	-0.30%	5.84%	-0.03%	-16.16%	-17.50%	-0.50%	-9.45%	-11.45%

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 07 shows the Jensen alpha of the selected mutual funds during 2013 to 2021. Dark red colored cells in the table indicate negative Jensen alpha. In 2021 all the mutual funds performed very poorly except DBH1STMF. In 2019 POPULAR1MF, SEBL1STMF, 1JANATAMF, EBLNRBMF, GRAMEENS2, IFIC1STMF, PHPMF1, TRUSTB1MF have earned positive alpha which indicates that fund managers are highly able to use the undervalued securities to earn higher risk premium. All other funds have negative alpha. In 2018 all the selected funds had negative alpha which means funds performed very poorly. In 2017 all the funds except SEBL1STMF, GREENDELMF and DBH1STMF had negative Jensen Alpha. In 2016 all the funds except SEBL1STMF had negative Jensen Alpha. In 2015 AIBL1STIMF, DBH1STMF, EBL1STMF, EBLNRBMF, GREENDELMF, IFILISLMF1 had positive Jensen Alpha, and the other mutual funds had negative Jensen Alpha. In 2014 SEBL1STMF, 1JANATAMF had positive performance and the other funds had negative performance which indicates poor performance.

4.3 M²

M² measures what the fund would have returned if it taken on the same total risk as the benchmark index. It gives an adjusted return that can be directly compared to the benchmark return.

Table 08 shows the M² of the selected mutual funds during 2013 to 2021. Performance was better in 2020 comparatively than any other years. Red colored cells in the table indicate M² that is below the benchmark return/market return. In 2019 all the selected mutual funds have negative M² value but among them 1STPRIMFMF, AIBL1STIMF, GRAMEENS2, GREENDELMF, SEBL1STMF and IFILISLMF1 have relatively lower negative value compared to market index. In 2018 all the selected mutual funds showed bad performance. In 2017 SEBL1STMF, GREENDELMF and DBH1STMF showed good performance above market index and the other funds showed poor performance with compared to benchmark index.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
Market	18.42%	14.54%	-24.38%	-12.51%	14.48%	11.29%	-2.79%	2.54%	8.55%
1JANATAMF	-4.21%	2.92%	-39.23%	-10.71%	-0.36%	-4.23%	-2.11%	1.92%	12.40%
1STPRIMFMF	10.94	12.64%	-18.01%	-12.94%	-3.31%	5.94%	-8.56%	-5.49%	-0.81%
AIBL1STIMF	-6.63%	36.43%	-9.36%	-24.34%	5.46%	-6.52%	20.88%	-17.46%	10.62%
DBH1STMF	10.94%	12.64%	-12.93%	-25.21%	17.31%	-0.80%	8.83%	-16.69%	6.91%
EBL1STMF	-4.47%	3.44%	-28.49%	-12.56%	1.17%	-0.83%	4.61%	-12.96%	-12.94%
EBLNRBMF	11.73%	6.91%	-43.56%	-13.15%	1.14%	-2.74%	-1.54%	-16.28%	-6.31%
GRAMEENS2	5.02%	15.03%	-7.59%	-16.70%	10.27%	1.31%	-20.39%	-1.62%	12.89%
GREENDELMF	-6.88%	-41.61%	-13.92%	-26.19%	18.06%	5.18%	-0.81%	-9.29%	5.54%
ICB3RDNRB	12.87%	18.16%	-20.21%	-25.59%	-5.79%	1.47%	-6.44%	16.05%	6.85%
IFIC1STMF	-3.71%	6.43%	-50.19%	-12.70%	-1.49%	-1.71%	-4.44%	-10.75%	-6.76%
IFILISLMF1	9.80%	15.67%	-14.87%	-22.66%	-6.00%	1.12%	-9.49%	-3.64%	19.39%
PHPMF1	0.36%	3.15%	-40.80%	-13.26%	0.67%	-4.41%	0.25%	-7.06%	11.00%
POPULAR1MF	-1.92%	-0.17%	-36.30%	-11.79%	-0.30%	-3.62%	-6.31%	-5.57%	5.12%
SEBL1STMF	-16.87%	11.44%	-13.01%	-35.74%	13.29%	6.79%	-5.53%	5.72%	-9.83%
TRUSTB1MF	0.33%	9.32%	-32.89%	-11.33%	1.22%	0.32%	-1.45%	-12.80%	-4.57%

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

In 2016 all the selected mutual funds showed very bad performance below the benchmark index. In 2015 AIBL1STIMF, DBH1STMF, EBL1STMF and PHPMF1 showed superior performance above the market index. In 2014 only SEBL1STMF showed good performance above the benchmark index. In 2013 1JANATAMF, AIBL1STIMF, GRAMEENS2, PHPMF1 and IFILISLMF1 showed good performance. All the selected mutual funds showed good performance in 2013 with compare to other years. With regard to M² measure all the funds perform badly when market was normal. They showed superior performance when market was bearish.

4.4 Information Ratio

It measures a fund's return in excess of benchmark return divided by the standard deviation of excess return. It indicates excess return earned per unit of residual risk. The higher is the information ratio the greater the fund manager's skill.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
1JANATAMF	-0.3778	-0.0979	0.3358	-0.0143	-0.5427	-0.2554	0.0626	0.0068	0.0682
1STPRIMFMF	-0.0292	0.0007	-0.3428	-0.1233	-0.6542	-0.1020	-0.1514	-0.2826	-0.2109
AIBL1STIMF	-0.4382	0.0626	0.1994	-0.0163	-0.2125	-0.3174	0.3594	-0.1969	-0.0024
DBH1STMF	-0.0292	0.0007	0.1725	-0.1947	-0.0241	-0.2284	0.1910	-0.2102	-0.0042
EBL1STMF	-0.3654	-0.0966	0.2784	-0.0628	-0.4519	-0.2105	0.1849	-0.1972	-0.3074
EBLNRBMF	-0.2904	-0.0775	0.3843	-0.0193	-0.3961	-0.2142	0.0945	-0.1630	-0.1930
GRAMEENS2	-0.4204	-0.0201	0.1420	0.0305	-0.1549	-0.1767	-0.1175	-0.0106	0.0954
GREENDELMF	-0.4101	-0.1999	0.1488	-0.2168	-0.0033	-0.2178	0.1021	-0.0707	-0.0125
ICB3RDNRB	-0.0851	0.0432	-0.1843	-0.3652	-0.9838	-0.1949	-0.0257	-0.1961	-0.0544
IFIC1STMF	-0.4510	-0.0790	0.1104	0.0118	-0.5087	-0.2397	0.0222	-0.0846	-0.2194
IFILISLMF1	-0.2069	0.0102	-0.0687	-0.2262	-0.7825	-0.1682	-0.0223	-0.1070	0.1631
PHPMF1	-0.3658	-0.0990	0.366	-0.0681	-0.4903	-0.2573	0.1125	-0.0862	0.0521
POPULAR1MF	-0.3874	-0.1156	0.319	0.0122	-0.4614	-0.2527	0.0195	-0.0527	-0.0139
SEBL1STMF	-0.5925	-0.0378	0.1402	-0.2452	0.0206	-0.0769	0.0385	0.0675	-0.1025
TRUSTB1MF	-0.3777	-0.0642	0.235	-0.0626	-0.4584	-0.1863	0.0854	-0.2694	-0.2221

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 09 shows the information ratio of the selected mutual funds from 2013 to 2021. Dark red colored cells in the table indicate negative information ratio. In 2021 ratio was negative for all the mutual funds. In 2019, all the selected funds except 1STPRIMFMF, ICB3RDNRB and IFILISLMF1 have positive information ratio which indicates that managers have the ability to generate excess return for per unit of residual risk. In 2018 all the selected mutual funds showed poor performance. All the funds except GRAMEENS2, IFIC1STMF and POPULAR1MF had negative Information Ratio. In 2017 only SEBL1STMF had positive Information Ratio. The performance of mutual fund was very poor in 2016 as all the selected mutual funds had

negative Information Ratio. This indicates whether managers were not skilled or there could be some factors beyond control. In 2015 all the selected mutual funds showed good performance except 1STPRIMFMF, GRAMEENS2, ICB3RDNRB and IFILISLMF1. In 2014 lower performance of all the selected mutual funds indicates that the managers are no skilled in generating excess return for per unit of residual risk. In 2014 only 1JANATAMF, GRAMEENS2, IFILISLMF1 and PHPMF1 had positive information ratio. No funds have consistent good performance in generating excess return for per unit of residual risk.

4.5 Fama Performance Measure

Fama (1972) decomposed the overall performance or excess return over risk free rate into selectivity and risk.

4.5.1 Overall performance: excess return over risk free rate

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
Market	17.17%	6.69%	-28.86%	-16.76%	10.93%	6.79%	-10.96%	-6.43%	-3.00%
1JANATAMF	-5.24%	-2.50%	-18.08%	-17.25%	-3.28%	-4.60%	-7.05%	-5.87%	0.54%
1STPRIMFMF	15.52%	6.79%	-46.75%	-22.01%	-9.60%	1.73%	-18.88%	-17.57%	-20.55%
AIBL1STIMF	-6.42%	12.59%	-18.91%	-17.59%	1.57%	-11.83%	10.06%	-16.32%	-3.77%
DBH1STMF	15.52%	6.79%	-20.39%	-23.55%	10.21%	-3.03%	0.53%	-14.90%	-3.24%
EBL1STMF	-5.35%	-2.32%	-19.77%	-19.04%	-2.17%	-4.29%	-3.10%	-14.24%	-21.88%
EBLNRMF	6.40%	-0.55%	-15.56%	-17.38%	-2.17%	-3.67%	-6.49%	-16.30%	-15.22%
GRAMEENS2	2.66%	4.67%	-21.85%	-15.81%	5.37%	-2.97%	-20.72%	-7.13%	1.30%
GREENDELMF	-5.11%	-39.24%	-21.56%	-24.34%	10.83%	-2.31%	-5.20%	-9.29%	-3.66%
ICB3RDNRB	13.40%	13.38%	-36.38%	-27.64%	-10.30%	-2.82%	-12.05%	-11.45%	-6.00%
IFIC1STMF	-3.45%	-0.86%	-17.18%	-16.39%	-4.55%	-3.88%	-9.82%	-11.29%	-15.94%
IFILISLMF1	8.91%	8.08%	-32.63%	-25.97%	-9.58%	-4.38%	-12.20%	-11.31%	8.92%
PHPMF1	-0.58%	-2.59%	-16.35%	-19.23%	-2.44%	-5.44%	-5.12%	-12.13%	-0.36%
POPULAR1MF	-2.40%	-4.37%	-16.65%	-16.31%	-3.75%	-5.01%	-9.79%	-10.07%	-3.72%
SEBL1STMF	-10.80%	2.80%	-20.91%	-27.52%	11.94%	2.88%	-8.35%	-2.15%	-10.48%
TRUSTB1MF	-0.69%	0.77%	-20.97%	-19.04%	-1.88%	-2.50%	-6.74%	-15.15%	-15.35%

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 10 shows the excess return over risk free rate of the selected mutual funds from 2013 to 2021. Dark red colored cells in the table indicate negative excess return. In 2021, none of the Mutual Fund had excess return over the market return. In 2019 market was bearish and earned excess return of -28.86%. All the selected mutual funds have a negative excess return which means all these funds cannot even surpass the risk free rate. In 2014 and 2018 the scenario was the same. All the selected mutual funds had generated negative excess return. In 2017 SEBL1STMF, AIBL1STIMF, DBH1STMF, GRAMEENS2 and GREENDELMF had generated positive excess return but only SEBL1STMF was able to generate excess return above the benchmark index. In 2016, all the selected mutual funds except 1STPRIMFMF and SEBL1STMF had generated positive excess return. In 2015 only 1STPRIMFMF and SEBL1STMF made superior performance above the market index. In 2013 only 1JANATAMF, GRAMEENS2 and IFILISLMF1 had excess return above the market index.

4.5.2 Selectivity Component

Selectivity means the ability of a fund manager to generate return by selecting undervalued securities. The selectivity component measures the portion of the fund's excess return beyond that is available to the benchmark (unmanaged) portfolio with identical systematic risk. A positive high value indicates that the fund has achieved superior returns and investors are benefited out of the selectivity exercised by the Fund Manager.

Table 11 shows the selectivity component of excess return of the selected mutual funds during 2013 to 2021. Dark red colored cells in the table indicate negative return.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
1JANATAMF	-27.05%	-2.86%	9.91%	-5.28%	-18.61%	-11.37%	-0.56%	1.42%	3.73%
1STPRIMFMF	-11.96%	-0.48%	-21.39%	-4.68%	-31.05%	-15.76%	-12.02%	-12.45%	-17.00%
AIBL1STMF	-26.68%	12.05%	-27.03%	-9.56%	-13.31%	-19.06%	13.29%	-9.54%	-1.18%
DBH1STMF	9.51%	5.77%	-10.09%	-12.51%	5.02%	-10.03%	6.74%	-8.50%	0.75%
EBL1STMF	-21.15%	-2.46%	-24.66%	-1.26%	-13.02%	-9.21%	6.96%	-9.89%	-19.04%
EBLNRBMF	-14.21%	-1.40%	8.46%	-0.90%	-13.35%	-14.66%	4.15%	-7.78%	-13.94%
GRAMEENS2	-13.99%	1.77%	0.01%	-7.64%	-4.11%	-7.19%	-10.08%	-1.15%	5.13%
GREENDELMF	-13.35%	-42.51%	-16.02%	-12.21%	5.48%	-7.70%	0.69%	-1.74%	-0.59%
ICB3RDNRB	-1.02%	10.57%	-10.76%	-20.13%	-30.12%	-8.45%	-8.37%	-4.80%	-3.83%
IFIC1STMF	-28.17%	-0.92%	13.36%	-5.55%	-16.85%	-8.83%	-0.14%	-4.26%	-12.40%
IFILISLMF1	-3.48%	6.54%	-8.23%	-19.92%	-21.68%	-11.73%	1.01%	-4.54%	11.96%
PHPMF1	-21.36%	-5.52%	10.76%	-6.52%	-15.66%	-12.14%	-0.50%	-4.84%	3.20%
POPULAR1MF	-20.60%	-7.88%	21.77%	-1.82%	-19.70%	-9.84%	-4.46%	-2.41%	-0.16%
SEBL1STMF	-13.21%	1.02%	7.68%	-26.92%	8.68%	0.19%	-4.18%	2.19%	-8.17%
TRUSTB1MF	-18.89%	-0.30%	5.84%	-0.03%	-16.16%	-17.50%	-0.50%	-9.45%	-11.45%

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

All the values in 2021 except DBH1STMF shows the poor ability of fund manager in security selection. In 2019, 1JANATAMF, EBLNRBMF, GRAMEENS2, IFIC1STMF, PHPMF1, POPULAR1MF, TRUSTB1MF and SEBL1STMF have positive values which indicates that these funds have earned superior monthly return due to the security selection ability of the fund manager. POPULAR1MF has the highest Selectivity in 2019. In 2018 all the selected funds had negative selectivity which indicates whether fund managers were unable in selecting best security for investment or there could be some factor beyond control. The negative value also indicates that the diversifiable risk taken by the fund manager did not generate extra returns. In 2017 all the funds had negative value except DBH1STMF, GREENDELMF and SEBL1STMF. In 2016 only SEBL1STMF was able to generate extra returns for taking diversifiable risk. In 2015 six among fifteen selected mutual funds showed good performance. In 2014 only 1JANATAMF and SEBL1STMF showed positive selectivity. In 2013 only five among fifteen mutual funds had positive values. In the above values we can see that no funds manager have the ability to continuously select the securities that will provide continuous return.

4.5.3 Risk Component

Risk component represents the required market risk premium of a fund. This is derived by multiplying the beta of the fund with market risk premium.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
1JANATAMF	21.81%	0.35%	-27.99%	-11.97%	15.33%	6.77%	-6.49%	-7.29%	-3.19%
1STPRIMFMF	27.47%	7.26%	-25.36%	-17.33%	21.45%	17.49%	-6.86%	-5.12%	-3.55%
AIBL1STMF	20.26%	0.54%	8.12%	-8.03%	14.89%	7.23%	-3.23%	-6.78%	-2.59%
DBH1STMF	6.01%	1.02%	-10.30%	-11.04%	5.19%	6.99%	-6.21%	-6.40%	-3.98%
EBL1STMF	15.80%	0.13%	4.89%	-17.77%	10.85%	4.91%	-10.07%	-4.35%	-2.84%
EBLNRBMF	20.60%	0.86%	-24.01%	-16.48%	11.19%	10.99%	-10.64%	-8.52%	-1.28%
GRAMEENS2	16.67%	2.90%	-21.86%	-8.18%	9.48%	4.21%	-10.64%	-5.98%	-3.83%
GREENDELMF	8.24%	3.27%	-5.54%	-12.13%	5.36%	5.40%	-5.89%	-7.55%	-3.07%
ICB3RDNRB	14.42%	2.81%	-25.63%	-7.52%	19.82%	5.63%	-3.68%	-6.65%	-2.17%
IFIC1STMF	24.73%	0.07%	-30.54%	-10.84%	12.30%	4.95%	-9.68%	-7.03%	-3.55%
IFILISLMF1	12.36%	1.55%	-24.41%	-6.05%	12.11%	7.34%	-13.21%	-6.77%	-3.03%
PHPMF1	20.78%	2.93%	-27.11%	-12.72%	13.21%	6.71%	-4.62%	-7.29%	-3.56%
POPULAR1MF	18.20%	3.51%	-38.42%	-14.48%	15.95%	4.83%	-5.33%	-7.66%	-3.56%
SEBL1STMF	2.40%	1.78%	-28.59%	-0.60%	3.26%	2.69%	-4.17%	-4.33%	-2.31%
TRUSTB1MF	18.20%	1.07%	-26.81%	-19.01%	14.28%	15.00%	-6.24%	-5.69%	-3.90%

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 12 shows the risk component of excess return of the selected mutual funds from 2013 to 2021. Dark red colored cells in the table indicate negative return. In 2020 and 2021 all the Mutual Funds showed positive values. In 2019 only AIBL1STMF and EBL1STMF have positive required return for systematic risk because both the funds have negative beta in this period. In 2016 and 2017 all the selected mutual funds have positive risk component because of higher beta in these periods. In 2018, 2015, 2014 and 2013 all the funds exposed to negative required return for systematic risk. This is due to negative market return in these periods.

4.5.4 Diversification

The selectivity component can further be divided into diversification and net selectivity. Diversification component represents the required return because of less than perfect diversification. Diversification represents fund manager's skill in knowing how much to diversify. The higher the rate the higher the systematic risk and lower the unsystematic risk.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
1JANATAMF	-5.32%	3.04%	16.05%	-7.35%	-6.16%	-3.19%	-1.02%	1.94%	1.27%
1STPRIMFMF	0.03%	2.22%	-34.65%	-4.12%	-6.14%	-9.36%	-5.51%	-2.70%	-1.45%
AIBL1STIMF	-6.28%	2.41%	-47.55%	-2.28%	-5.87%	0.06%	-5.45%	2.81%	-9.62%
DBH1STMF	21.50%	8.47%	-23.51%	-2.35%	2.92%	-3.10%	-2.57%	2.67%	1.89%
EBL1STMF	0.26%	3.39%	-22.20%	-1.20%	-0.89%	0.56%	0.51%	0.17%	0.15%
EBLNRBMF	-10.13%	3.02%	14.66%	-0.26%	-1.35%	-7.55%	3.32%	4.36%	-1.28%
GRAMEENS2	-4.53%	1.45%	-30.40%	-4.47%	-0.75%	2.12%	2.69%	1.65%	0.93%
GREENDELMF	2.55%	2.04%	-28.29%	-1.27%	2.80%	-2.07%	-0.46%	4.27%	1.24%
ICB3RDNRB	5.38%	5.87%	-16.91%	-8.00%	-7.77%	0.68%	-5.36%	0.75%	-1.66%
IFIC1STMF	-12.80%	3.96%	21.47%	-15.49%	-2.43%	-0.71%	1.15%	3.35%	0.93%
IFILISLMF1	5.53%	5.37%	-24.27%	-10.12%	-1.14%	1.47%	5.64%	0.99%	-0.39%
PHPMF1	-9.60%	0.76%	16.69%	-5.69%	-3.96%	-2.56%	-2.46%	2.42%	1.59%
POPULAR1MF	-5.19%	0.14%	26.63%	-2.55%	-5.30%	-0.64%	-2.08%	3.21%	1.82%
SEBL1STMF	7.83%	3.44%	-5.92%	-10.93%	10.13%	5.86%	-2.51%	0.08%	0.83%
TRUSTB1MF	-5.31%	2.44%	10.61%	-1.47%	-5.48%	-10.94%	-1.43%	1.22%	1.04%

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 13 shows the diversification component of total selectivity of the selected mutual funds from 2013 to 2021. Dark red cells represent negative values. In 2021 1STPRIMFMF, DBH1STMF, EBL1STMF, GREENDELMF, ICB3RDNRB, IFILISLMF1 and SEBL1STMF have positive diversification values which means that returns generated by these funds are mostly depends on systematic risk and rest eight mutual funds have negative value which means that the managers are taking some level of diversifiable (unsystematic) risk for generating returns. In 2018 all the funds had negative value which means that fund's manager took some diversifiable risk for generating returns. In 2014 all the selected mutual funds except one has positive value, which means that managers were unable or there were some factor beyond control to generate profit by diversification.

4.5.5 Net Selectivity

Net selectivity represents how much of the risk premium comes from the ability to select undervalued stocks. The higher is net selectivity the higher the manager's ability in selection of security.

Mutual Fund	2021	2020	2019	2018	2017	2016	2015	2014	2013
1JANATAMF	-21.72%	-5.90%	-6.14%	2.07%	-12.44%	-8.18%	0.46%	-0.51%	2.46%
1STPRIMFMF	-11.99%	-2.70%	13.26%	-0.56%	-24.91%	-6.41%	-6.52%	-9.75%	-15.55%
AIBL1STIMF	-20.41%	9.64%	20.52%	-7.28%	-7.44%	-19.13%	18.74%	-12.34%	8.44%
DBH1STMF	-11.99%	-2.70%	13.42%	-10.15%	2.10%	-6.92%	9.31%	-11.17%	-1.14%
EBL1STMF	-21.41%	-5.84%	-2.46%	-0.06%	-12.14%	-9.76%	6.45%	-10.06%	-19.20%
EBLNRBMF	-4.08%	-4.43%	-6.21%	-0.64%	-12.00%	-7.11%	0.83%	-12.15%	-12.66%
GRAMEENS2	-9.47%	0.32%	30.41%	-3.17%	-3.36%	-9.30%	-12.77%	-2.80%	4.20%
GREENDELMF	-15.91%	-44.55%	12.26%	-10.94%	2.67%	-5.64%	1.15%	-6.02%	-1.83%
ICB3RDNRB	-6.41%	4.70%	6.15%	-12.12%	-22.36%	-9.13%	-3.02%	-5.55%	-2.16%
IFIC1STMF	-15.37%	-4.89%	-8.11%	9.94%	-14.42%	-8.13%	-1.28%	-7.61%	-13.33%
IFILISLMF1	-8.99%	1.17%	16.04%	-9.80%	-20.54%	-13.20%	-4.63%	-5.54%	12.34%
PHPMF1	-11.75%	-6.28%	-5.93%	-0.83%	-11.70%	-9.58%	1.96%	-7.26%	1.61%
POPULAR1MF	-15.41%	-8.02%	-4.86%	0.73%	-14.40%	-9.20%	-2.38%	-5.62%	-1.98%
SEBL1STMF	-21.04%	-2.42%	13.60%	-15.99%	-1.45%	-5.66%	-1.67%	2.11%	-9.00%
TRUSTB1MF	-13.58%	-2.74%	-4.77%	1.44%	-10.68%	-6.56%	0.93%	-10.67%	-12.49%

[Source: Data calculated based on Monthly Net Asset Value (NAV) of mutual funds]

Table 14 shows the net selectivity component of total selectivity of the selected mutual funds from 2013 to 2021. The dark red cell represents negative return. In 2021 all the Mutual Funds showed negative values which indicates the poor performance of the fund's manager. In 2019 eight mutual funds among the fifteen have positive value which indicates that managers of

these eight funds have superior security selection ability. In 2016 net selectivity was negative for all the selected funds which indicate managers were not skilled in selecting securities or there could be some unavoidable reasons. In 2015 eight of fifteen selected mutual funds showed good managements skills in selecting securities. In 2014 except SEBL1STMF all the mutual funds negative value which means that the managers of these mutual funds were not skilled in selecting the best securities.

5.0 Overall Performance of Mutual Funds in Bangladesh

It can be argued that the selected fifteen mutual funds studied in this paper represent the mutual fund industry of Bangladesh. From the performance analysis of the fifteen funds, the following statements are deduced about the mutual fund industry of Bangladesh. Systematic risk was low for most of the funds but the total risk was high. So the funds had high volatility in returns. When the market was normal or bullish most of the mutual funds failed to generate above-market returns. Almost all the funds failed to generate returns above the risk-free rate. According to Sharpe's measure all the funds had shown poor performance during the period 2013 to 2021. With regards to Treynor ratio and Jensen alpha no funds among the selected mutual funds consistently showed Poor performance. All the other funds had performed poorly during the period 2013 to 2021. Performance only in periods when the market was bearish. When the market was normal the funds performed poorly. When excess return over risk-free rate is considered no funds had shown consistency in achieving a positive excess return. Managers are not skilled enough in selecting the best portfolio of securities. When the fund manager's stock selection ability is examined it is found that the fund managers had only shown superior stock selection ability when the market was bearish. When the market was normal, they demonstrated poor selection skills.

5.1 The Drawbacks of the Mutual Fund Sector

As shown in the above study the performance of the mutual fund industry of Bangladesh is very poor. The reasons behind poor performance are as follows:

➤ Definitional problem

This is perhaps the root cause behind the poor performance of the mutual fund sector of Bangladesh. The mutual fund in Bangladesh is wrongly defined. A mutual fund in Bangladesh is regulated by Mutual Fund Bidhimala, 2001. According to Mutual Fund Bidhimala, 2001 Mutual fund is a fund created as a trust to collect money from general investors by the sale of units for investing in money market securities. In Bangladesh, a mutual fund consists of four parties. They are sponsor, trustee, custodian, and asset manager. Now, look at how the mutual fund is defined in other countries. USA Securities and Exchange Commission defined mutual fund as "A mutual fund is an SEC-registered open-end investment company that pools money from many investors and invests the money in stocks, bonds, short-term money-market instruments, other securities or assets, or some combination of these investments." For India "a mutual fund is a professionally-managed firm of collective investments that pools money from many investors and invests it in stocks, bonds, short-term money market instruments, and/or other securities." (Gandhi and Perumal, 2017) In Mutual Funds Law (2015 Revision) the definition of a mutual fund is given as "mutual fund means a company, unit trust or partnership that issues equity interests, the purpose or effect of which is the pooling of investor funds with the aim of spreading investment risks and enabling investors in the mutual fund to receive profits or gains from the acquisition, holding, management or disposal of investments." So the mutual fund is a company. But in Bangladesh, mutual funds are not defined as a company. Not being defined as a company mutual fund in Bangladesh get the full experience of a mutual fund. If it were defined as a company then the roles and responsibilities would be different. The

governance system would also be different. All the benefits that come as a company will increase performance.

➤ **Lack of professionalism and capability of fund managers**

In Bangladesh, fund managers are not well trained. Their ability to manage a fund is poor compared to other countries. Without having proper knowledge of modern finance the fund managers are exposed to making wrong decisions frequently. As shown in this study the stock selection skill of the fund managers is very low. Although partly this is due to the high uncertainty of the market, one cannot skip their lack of capabilities and experience as an important determiner.

➤ **Volatile and underdeveloped market**

Bangladesh's stock markets are mostly volatile and easily manipulated in nature. The market is frequently attacked by gamblers. Many stocks show abnormal behavior. Moreover the market is not efficient. All these factors magnify the poor performance of mutual funds.

➤ **Limited asset class**

Bangladesh only has an underdeveloped stock market. There is no bond market or market for other financial instruments. The lack of a wide range of asset classes limits the performance of mutual funds. With this narrow choice, it is difficult to properly match the risk-return objective of a mutual fund with its portfolio selection.

➤ **More preference to technical analysis**

Fundamental analysis is not widely used in Bangladesh for the selection of companies for investment purposes. Rigorous fundamental analysis is seldom done. Fund managers generally prefer to use technical analysis. This leads to making the wrong choices. Technical analysis is useful but without fundamental analysis, sole use of technical analysis may lead to loss.

➤ **More focus on short term gain**

Investors in Bangladesh generally do not prefer to think on a long-term stance. They prefer to give more attention to short-term gain.

Conclusion

Though the mutual fund industry is very large globally but it is very small for Bangladesh. The size of the mutual fund industry is only 0.17% of the GDP. The mutual fund has the ability to provide solutions to the various needs of the investors. In a global context, an investor can choose from a wide variety of mutual fund that matches his/her risk-return objective. In this study, an attempt is made to evaluate the performance of the mutual fund of Bangladesh. An attempt to identify the drawbacks in this industry is also made. All the popular evaluation tools are used in this study. While mutual funds are flourishing and shining globally with superior performance, the case of this industry in Bangladesh is going in the opposite direction. Most of the funds have shown poor performance consistently during the study period. That indicates the fund managers' poor investment prowess and selection skill. Also, volatility of the market is very high which may occur due to frequent attacks by gamblers. The assets classes are limited. All these contribute to the obstacle. The most surprising fact is that the definition of mutual funds is wrongly incorporated in Bangladesh. However new investors have a significant interest in this industry. They are entering this sector with new thoughts and perceptions. Actually there weren't much more study with large scale dataset about the performance evaluation of mutual fund sector of Bangladesh. In order to flourish this sector more research should be done about this sector. This study is a tiny attempt to contribute in this way.

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