An Evaluation of Mutual Fund Performance in an Emerging Economy: Evidence from Bangladesh

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ABSTRACT

This study evaluates the relative performance of mutual funds listed on the Dhaka Stock Exchange (DSE) over a ten-year period, from July 2014 to June 2024. Utilizing secondary data, the research examines 21 actively traded closed-end mutual funds, focusing on their risk-adjusted performance metrics. Key measures, including the Sharpe ratio, Treynor ratio, Jensen's Alpha, and Fama's decomposition model, are employed to assess fund effectiveness relative to market benchmarks, specifically the DSEX index. Findings indicate that a significant portion of the mutual funds underperformed based on annualized return on the benchmark, with only a few demonstrating superior risk-adjusted returns. Most funds exhibited a moderate relationship (R^2 ranging from 20%-40%), suggesting that their returns were not heavily dependent on systematic risk (βp). This indicates that managers were assuming a certain level of diversifiable (unsystematic) risk. The analysis further reveals that fund managers' selectivity and diversification strategies play critical roles in value creation. All funds exhibited negative values, indicating a deficiency in selectivity among fund managers. It also comes to the conclusion that, in terms of risk and return model performance, mutual funds in Bangladesh have a stronger overall position than the benchmark index during the course of the study period. The findings of this study will be useful for all kinds of investors, policy makers, corporations and financial market participants. Therefore, this study aspires to offer practical utility by serving as a reference point for prospective investors, furnishing valuable insights to aid in informed decision-making within the dynamic landscape of the stock market.

Introduction

Mutual funds have become increasingly popular in Bangladesh, particularly within the framework of the Dhaka Stock Exchange (DSE). Serving as an

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attractive investment option, mutual funds enable both individual and institutional investors to pool their resources, gaining access to a diversified portfolio of assets that are managed by professional fund managers. This collective investment approach not only reduces individual investment risk but also increases the potential for returns in the rapidly growing Bangladeshi market. Effective portfolio management is crucial for investment success, especially in emerging markets like Bangladesh, where unique economic dynamics and market structures present distinct challenges and opportunities. As Bangladesh's financial landscape evolves—driven by regulatory changes, technological advancements, and rising foreign investment—it's essential for both individual and institutional investors to comprehend the performance of portfolio managers.

The performance of mutual funds may be measured using a variety of numerical indicators that have been created in the literature and are often used in practice. Well-known measures that evaluate the predicted returns of mutual funds in proportion to their risks include the Treynor ratio (1965) and the Sharpe ratio (1966). These risk characteristics are specifically included in the portfolio assessment model used in this work, which builds on previous theoretical developments about capital asset pricing under uncertainty by Sharpe (1964) and Lintner (1965). An essential part of investment management is assessing portfolio performance, which provides information about how well investment strategies work and how well portfolio managers can generate returns in relation to risk. Without the complexity of relative benchmarks, evaluating portfolio performance using absolute measurements in the context of the DSE, one of South Asia's top equities markets, offers a clearer grasp of real gains or losses.

This paper concentrates on the absolute measure of portfolio performance evaluation within the DSE, aiming to deliver a thorough analysis of portfolio performance in terms of total returns, risk-adjusted returns, and the influence of market conditions. As Bangladesh's economy continues to expand, grasping the performance dynamics of investments in the DSE becomes increasingly vital for individual and institutional investors alike. By utilizing absolute performance metrics, including the Sharpe ratio, Jensen's alpha, and the Treynor ratio, this study aims to shed light on the effectiveness of various investment strategies in the DSE. Additionally, it will examine the implications of these performance measures for portfolio management practices and investment decision-making in a changing market environment. Through this analysis, the paper aspires to provide valuable insights that can enhance investment strategies and foster greater confidence in the DSE as a promising investment destination.

Literature Review

Evaluating fund managers' performance has become a critical subject for practitioners and scholars alike as mutual funds continue to gain popularity. Around the world, a great deal of research has been done to evaluate the performance of managed portfolios, with an emphasis on finding the best fund managers. Evans et al. (2024) investigated the connection between team diversity and asset management effectiveness, with a particular emphasis on political ideology as a crucial identity feature. According to their results, diverse teams often perform better than homogenous ones because multiple viewpoints improve decision-making and team members watch the team more closely. Nevertheless, these advantages are lessened in highly politicized settings, which increases intrateam strife. According to the report, there is a dearth of managers with a variety of ideologies in the local labor market, and established managers frequently choose uniform teams.

According to research by Alsubaiei et al. (2024), mutual fund performance is severely impacted by oil market volatility. Regardless of the volatility and performance indicators they employed in their investigation, this detrimental effect persisted. Furthermore, their findings indicated that increased oil volatility impairs fund managers' ability to choose stocks. Reducing investment limits does not always improve fund performance, according to Han et al.'s (2024) analysis of mutual fund performance as they raised their holdings of H-shares. Information asymmetry and fund managers' restricted access to H-share information are major causes of this underperformance, which forces them to use investor-pleasing tactics.

Tan et al. (2024) looked at how mutual fund efficiency during the COVID-19 pandemic was affected by Environmental, Social, and Governance (ESG) performance. Through the use of hypothesis testing and Data Envelopment Analysis (DEA), they discovered that mutual funds with lower ESG controversy scores fared better than those with higher controversy scores, suggesting increased. As the measuring horizon lengthens, the proportion of U.S. stock mutual funds that beat the SPY ETF drastically decreases, according to Bessembinder et al. (2023). According to their findings, several funds with positive monthly alpha estimates had negative long-term anomalous returns, indicating that fund return distributions have a positive skewness that rises with investment horizon.

The connection between fund performance and fund manager attributes has been the subject of several research. In contrast to their male colleagues, female fund managers often earn greater double-adjusted alphas, a difference that holds true over a number of months, according to Lin et al. (2023). The fact that managers' tenure and educational attainment had no statistically

significant effects on alpha values is intriguing and raises the possibility that conventional alpha measurements might provide inaccurate results. Guo et al. (2022) talked about divesting from fossil fuels as a way to help push energy toward greener sources. Their findings showed no discernible difference in risk-adjusted returns between investments in fossil fuels and their alternatives, suggesting that investors may switch to low-carbon companies without compromising their investing goals.

Pant et al. (2022) looked at how Nepali mutual fund performance was impacted by both macroeconomic and internal variables. Fund age had a beneficial effect on performance, while cash ratios, expense ratios, and economic indicators had a negative effect, according to their study. In response to the increased interest of investors in ESG, Sadeghi Goghari et al. (2020) investigated whether mutual funds that invest in ESG-compliant assets perform better than those that do not. In fact, funds with higher ESG ratings did better than those with lower ratings, according to their analysis on European mutual funds. Biplob (2017) examined the performance of 15 closed-end mutual funds in Bangladesh and found that nine of them were successfully lowering unique risk and were well-diversified. Although a reasonable degree of selectivity was noted, the study did not find any statistically significant timing skill among fund managers.

Sharma (2016) evaluated the net selectivity performance of 30 firms between April 2010 and March 2015 using the Fama decomposition model and found that the majority had superior stock selection and positive net selectivity. Using a variety of performance metrics, Seddeke & Rahman (2016) investigated the performance of mutual funds in Bangladesh and discovered that all of them had negative net selectivity, a sign of inadequate stock selection and diversification. According to Arslan et al. (2015), who assessed mutual fund performance in Pakistan between 2010 and 2013, the majority of schemes underperformed as a result of poor stock selection and insufficient management expertise.32 mutual funds in Bangladesh were evaluated by ACMA (2014), which discovered that several of them produced anomalous returns when compared to market benchmarks. The results of previous research on risk-adjusted performance metrics, including Treynor, Jensen, and Sharpe ratios, are consistent with this analysis.

According to risk-return models, Lohana (2013) looked at a few Indian mutual funds and discovered that, although all of the funds beat market index returns, the gains were not significant. Using a variety of performance criteria, Prajapati & Patel (2012) also examined Indian mutual fund schemes and found that the majority of them had positive returns from 2007 to 2011. Only a tiny portion of the best-performing mutual funds continued to have positive alpha performance after fees, according to Cuthbertson et al. (2010), who evaluated

mutual fund performance mainly in the US and the UK. When evaluating fund managers' capacity to choose cheap stocks, Jensen (1972) found that, for his sample of 115 mutual funds, managers were unable to predict asset prices accurately enough to pay for fees and research costs. Fama (1972) presented a methodology for assessing the performance of mutual funds by dissecting it into elements like risk, diversity, and net selectivity.

Objectives of the Study

This article aims to evaluate the relative performance metrics of mutual funds that are listed on the Dhaka Stock Exchange. Fund managers, investors, and academics all need to understand how mutual funds perform. In order to accomplish this goal, the research has set the following particular mutual fund performance goals:

> ➢ To assess how well-chosen mutual funds perform risk-adjusted on the DSE.
> ➢ To investigate how diversity and selectivity contribute to investment value development.

Data and Methodology

Population, Sample, and Sampling Techniques

This study utilized secondary data sources for its analysis. The sample of mutual funds was selected based on those listed on the Dhaka Stock Exchange (DSE). To evaluate the market performance of these mutual funds, the study considered the monthly closing values of stock prices. Specifically, data for all mutual funds were collected for the period from July 2014 to June 2024.

The analysis focuses on 21 mutual funds that have been actively traded on the DSE for at least the past ten years. Data was sourced from the DSE data library, and the risk-free rate was estimated using the average 10-year Treasury bond rate from auction results provided by the Bangladesh Bank. The collected data were organized and consolidated to meet the study's requirements. To facilitate a meaningful evaluation, the performance of the mutual funds was compared against their respective benchmark portfolios, with the DSEX serving as the proxy benchmark index for all selected mutual funds.

Tools and Techniques: All Financial Tool and Statistical Tool have been made by MS Excel 2019 software.

Financial Tool	Statistical Tool
Sharpe Ratio, Treynor Ratio, Jenson Ratio Fama's Net Selectivity, Capital Asset Pricing Model	Standard Deviation, R-squared, Alpha, Beta, Correlation

Return: The following has calculated the average return on mutual funds using the monthly return data. Likewise, the benchmark index's monthly returns have been calculated.

For the benchmark index, the return of Dhaka Stock Exchange (DSE) is calculated as:

Annualized Average Return$=[\frac{R_1+R_2+R_3…+R_n}{N}] \times 12$………………. (i)

Where,

R_1= Return of first month
R_2=Return of second month
R_3= Return of third month
N= Number of months.

Risk: A measure of overall risk is the standard deviation. The standard deviation, σ = Var (r), is the variance's square root. Both the variance and the standard deviation are quantitative indicators of an asset's overall risk that are equally appropriate and comparable. The average monthly returns are used to calculate the variance and standard deviation.

$$\sigma = \sqrt{\frac{\sum(X_i-\mu)}{N}}$$

………………………………………………(ii)

Where,

σ   =   Population standard deviation
N   =   The size of the population
X_i =   Each value from the population
μ   =   The population mean.

Beta: Beta is a metric for non-diversifiable or systematic risk. It calculates how sensitive the stock is in relation to a wide market index.

$\beta = \frac{Covariance\ (r_{market}, r_{stock})}{Variance(r_{market})}$ ………………………………………

(iii)

Where,
Rm = the return on the overall market
Rs = the return on an individual stock

Covariance = How change in a stock's market returns is related to changes in the market's returns.

Variance = How far the market's data points spread out from their average value.

Unsystematic Risk: Unsystematic risk, usually referred to as specific risk, refers to the risks that are particular to a particular business or sector. These hazards, however, don't only affect one company at a time. A bad management, for instance, might be a particular danger to the stock price of a single firm. And that's how unsystematic risk may be quantified statistically.

$$\sigma_{\in} = \sqrt{\sigma^2 j - \beta^2 j.\, \sigma^2 m} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.$$
(iv)

Where,

$\sigma_{\in}$ = unsystematic risk of mutual fund

$\sigma^2 j$ = Total Risk of mutual fund

$\beta^2 j.\, \sigma^{2\,m}$ = Market risk

R-squared (R²): An indicator of how effectively a model's independent variable or variables explain variance in the dependent variable is called R^2. A score of 1 indicates a perfect match between the model and the data, and its values range from 0 to 1.

To calculate R^2, several steps are involved. First, data points for both the dependent and independent variables are collected. Then, regression analysis is performed to determine the line of best fit, which represents the relationship between the variables. This regression line provides a visual representation of how closely the independent variables correlate with the dependent variable.

Fama Measures: While risk-adjusted performance metrics are valuable for assessing a fund's overall success, they may not adequately reveal the specific factors contributing to that performance. To gain deeper insights, it is advantageous to decompose the overall performance into distinct components. In addition to conventional risk-return metrics, utilizing performance decomposition as proposed by Eugene F. Fama allows for a more nuanced analysis of investment performance. Fama's framework decomposes portfolio performance into several key components:

Net Selectivity: This measures the portfolio manager's ability to choose securities that outperform the market after costs. It reflects the manager's skill in selecting individual investments that generate higher returns than a passive market strategy.

Market Timing: This assesses the manager's ability to forecast market trends and adjust the portfolio's exposure to risk accordingly. A successful market timing strategy can enhance returns by capitalizing on anticipated market movements.

Net Return to Risk*:* This component evaluates how much return was earned for each unit of risk taken. It adjusts the excess return by the portfolio's risk level, allowing for a comparison of portfolios with varying degrees of risk exposure.

Diversification Return: This measures the additional return generated from effectively diversifying across assets or securities. Proper diversification can reduce risk and contribute to more stable returns, enhancing portfolio performance.

Risk-Free Return: This represents the baseline return from risk-free investments, such as government bonds. It serves as a benchmark to assess whether the portfolio's risk-taking led to additional value beyond what could be achieved without risk.

It should be mentioned that selectivity and positive net selectivity are unlikely to differ substantially from one another. In conclusion, as both measures would provide the same outcome, it is wise to test either selectivity or net selectivity for performance evaluation in the case of well-diversified portfolios. In the case of a diversified portfolio, net selectivity is a more suitable metric.

$$\textbf{Ft} = \textit{Portfolio Return} - \textit{Risk free return} - \textit{Returns due to all risks}$$

$$= (R_t - R_f)\text{-}\{ (\sigma_t/ \sigma_m) (R_m - R_f)\}\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(v)}$$

Fama (1972) measures breaks down the observed return into four components:

  i.   Risk free return R_f
  ii. Compensation for systematic risk= $\beta (R_m - R_f)$
  iii. Compensation for inadequate diversification = $(R_m - R_f)\{(\sigma_t/ \sigma_m)\text{-} \beta\}$
  iv. Net superior returns due to selectivity = $(R_t - R_f)\text{-}\{ (\sigma_t/ \sigma_m) (R_m - R_f)\}$

Performance Analysis of Mutual Funds, the risk-return relation models given by Sharpe (1966), Treynor (1965) and Jensen (1968) have been applied.

Sharpe's Ratio: A popular metric in finance for assessing an investment or portfolio's risk-adjusted performance is the Sharpe Ratio. William F. Sharpe, a Nobel winner, created it to assist investors comprehend how much more return they are getting for taking on more risk than they would from a risk-free investment.

Formula:

$$\text{Sharpe Ratio} = \frac{R_p - R_f}{\sigma_p}$$

………………………………………. (vi)

Where,

R_p = Expected portfolio return

R_f = Risk free rate (usually the return on government bonds)

σ_p = Standard deviation of portfolio returns (a measure of risk or volatility)

Interpretation:

> • **A higher Sharpe Ratio:** Denotes superior returns adjusted for risk. The investment yields a higher return for each unit of risk accepted.

> • **A lower Sharpe Ratio:** suggests that the expected rewards would not outweigh the degree of risk. For a given amount of return, an investor may be taking on too much risk if their Sharpe Ratio is low.

Treynor Ratio: it is another risk-adjusted performance measure that evaluates the return generated by a portfolio or investment, relative to its systematic risk (also known as market risk or beta). It was developed by Jack Treynor, and like the Sharpe Ratio, it helps assess how well a portfolio compensates an investor for the risk taken.

Formula:

$$\text{Treynor's Ratio} = \frac{R_p - R_f}{\beta_p}$$

……………………………………… (vii)

Where,

R_p = Expected portfolio return

R_f = Risk free rate (usually the return on government bonds)

β_p = Beta of the portfolio, which measures the portfolio's sensitivity to market movements (systematic risk)

Interpretation:

- **Higher Treynor Ratio**: Indicates that the portfolio is generating more return per unit of market risk (beta). A higher ratio is better because it means the investment is efficiently compensating the investor for the risk exposure to the market.

- **Lower Treynor Ratio**: Suggests that the return per unit of market risk is lower, meaning the investment may not be providing sufficient returns for the amount of risk taken.

Jensen's Measure: Also referred to as Jensen's Alpha, this performance evaluation indicator calculates the excess return that an investment or portfolio produces over its anticipated return using the Capital Asset Pricing Model (CAPM). It was created in 1968 by Michael Jensen and is a crucial measure of how well a portfolio manager fared in comparison to market expectations while taking risk into consideration.

Formula:

$$\alpha = R_p - [R_f + \beta_p (R_m - R_f)]$$

……………………. (viii)

Where,

α = Jensen's Alpha (the value -added by the portfolio manager)

R_p = Actual portfolio return

R_f = Risk – free rate (e.g., government bond rate)

β_p = Beta of the portfolio (systematic risk)

R_m = Market return (e.g., return of a benchmark index)

Interpretation:

- **Positive Alpha (α>alpha > α>0)**: Indicates that the portfolio has outperformed its expected return, given its level of market risk. This suggests that the portfolio manager has added value through skillful selection or timing.

- **Negative Alpha (α<alpha < α<0)**: Implies that the portfolio has underperformed compared to what CAPM would predict, meaning the manager has not been able to compensate for the level of risk taken.

- **Alpha of Zero (α=alpha = α=0)**: Means the portfolio performed exactly as expected based on its risk, without adding or losing value relative to the market.

Analysis and Interpretation

Empirical analysis is mainly divided into four parts. First section deals with the risk and return analysis and in second part discuss about the relationship between Total risk and coefficient of determination. In part three showed the Result of Fama Decomposition Model and after all in last part showed Performance Analysis of Mutual Funds in Dhaka Stock exchange.

Table 1: Risk and Return analysis of mutual funds

| Name	Annualized Return	Rank	Above market return	Below market return	Total Risk (%)	Rank	Beta	Rank
1JANATAMF	-2.33%	19		√	8.04%	8	0.84	6
1STPRIMFMF	18.13%	1	√		15.02%	1	1.02	1
ABB1STMF	-4.25%	21		√	7.34%	15	0.83	7
AIBL1STIMF	5.31%	6	√		8.01%	9	0.31	21
DBH1STMF	-0.47%	14		√	6.28%	20	0.52	19
EBL1STMF	-0.23%	12		√	8.92%	3	0.97	3
EBLNRBMF	-0.88%	15		√	8.84%	4	0.98	2
GRAMEENS2	1.93%	10		√	5.98%	21	0.79	9
GREENDELMF	-0.24%	13		√	7.25%	17	0.57	17
ICB3RDNRB	2.49%	9		√	6.95%	18	0.76	12
ICBAMCL2ND	5.51%	5	√		8.66%	5	0.89	4
ICBEPMF1S1	3.42%	7	√		8.10%	6	0.55	18
IFIC1STMF	-2.26%	18		√	7.58%	14	0.77	11
IFILISLMF1	0.07%	11		√	6.30%	19	0.66	16
MBL1STMF	2.74%	8		√	8.10%	7	0.66	15
PF1STMF	9.97%	3	√		10.61%	2	0.82	8
PHPMF1	-1.02%	16		√	7.82%	11	0.72	14
POPULAR1MF	-2.52%	20		√	7.28%	16	0.78	10
PRIME1ICBA	6.07%	4	√		7.97%	10	0.87	5
RELIANCE1	11.39%	2	√		7.74%	12	0.50	20
TRUSTB1MF	-2.25%	17		√	7.61%	13	0.75	13
Market	2.90%				3.89%		1	

Source: Authors calculation

Table 1 lists the risk and return of several mutual funds in addition to the benchmark risk return. The funds with the best annualized return were 1STPRIMFMF while the funds with the lowest annualized return were ABB1STMF. Moreover, the table indicates that the average return of 14 mutual funds is lower than the average return of the benchmark index, while the annualized return of 7 mutual funds is higher than the benchmark index average. According to the results, seven mutual funds (33.33 percent) out of twenty-one are able to outperform the benchmark index, indicating that they

performed better than the DSEX, whereas fourteen funds (66.67 percent) are unable to do so.

1STPRIMFMF is the riskiest and GRAMEENS2 is the less risky in the entire sample.

In addition, the result of total risk the 1STPRIMFMF gave the highest risk and GRAMEENS2 gave the lowest return in all mutual funds. All the mutual funds are beat the benchmark return by total risk. In systematic risk part only 1 mutual fund (1STPRIMFMF) is more volatile than benchmark and it is evident that, most of the funds are less volatile than benchmark by beta.

Graph 01: Risk and Diversification
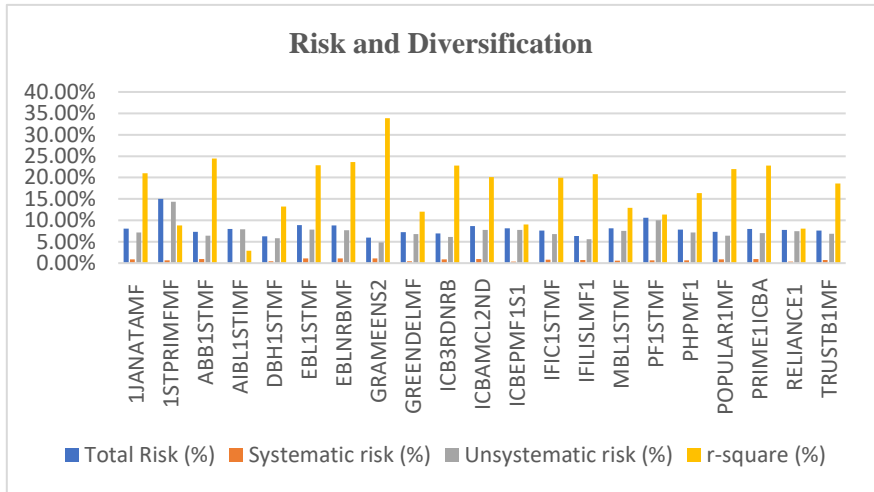
Graph 01 shows the Dhaka Stock Exchange's mutual fund situation by risk. According to the results (Graph 1), the mutual funds chosen for this study had R2 values between 2.90% and 33.84% during the course of the study. A moderate connection R2 (between 20% and 40%) indicates that the majority of the funds' returns are independent of systematic risk (βp). Here, managers are assuming a certain amount of unsystematic, diversifiable risk.

Mutual funds with low R2 values have less portfolio diversity, whereas those with high R2 values have a well-diversified portfolio. The majority of the funds, such as AIBL1STIMF (2.90%), RELIANCE1 (8.06%), and 1PRIMFMF (8.79%) mutual funds, have poor R2 values, according to Graph 1. The portfolio's unique risk is high and its unsystematic risk is low due to its lack of diversification, but the overall risk is quite high. However, because to its well-diversified portfolio, the GRAMEENS2 mutual fund exhibits a high

R2 rating of 33.84%, indicating low total risk and systematic risk. Additionally, the ABB1STMF mutual fund has a well-diversified portfolio, as seen by its low total risk (7.34%) and high R2 value (24.45%).

Table 2: Correlation of risk & Coefficient of determination (R2)

Name	*Total Risk (%)*	*Systematic risk (%)*	*Unsystematic risk (%)*	*R-square (%)*
Total Risk (%)	1			
Systematic risk (%)	-0.01977779	1		
Unsystematic risk (%)	0.989500737	-0.164069694	1	
R-square (%)	-0.389440537	0.909922781	-0.515773177	1

Source: Authors calculation

From the Table-**2**, reveals the relationship among Risk with the coefficient of determination indicating movement of respective variables in a regression model. Value of positive correlation indicates same way changes with variables changes, which means changing return with market with proportion to degree of correlation and negative correlation indicates opposite directions movement against variables. It is manifested that total risk shows negative correlation with systematic risk (-0.01977779) and r-square (-0.389440537), and there is strong positive correlation between total risk and unsystematic risk (0.989500737). There is also negative correlation between unsystematic risk and systematic risk (-0.164069694), and there is strong positive correlation between systematic risk and r- square (0.909922781), that indicates same correlation between them. Added that there is also negative correlation between unsystematic risk and r- square (-0.515773177). It represents that high r- square experienced low total risk and systematic risk.

Table-3: *Result of Fama Decomposition Model*

Name	Risk Free Rate	Market Premium	Return of Diversification	Return of selectivity	Fama's Net Selectivity	Portfolio Return
1JANATAMF	7.52	-3.8784	-3.6284	-2.3464	-18.3205	-2.33
1STPRIMFMF	7.52	-4.6909	-2.2129	17.5113	-5.2138	18.13
ABB1STMF	7.52	-3.8221	-3.7760	-4.1677	-19.4948	-4.25
AIBL1STIMF	7.52	-1.4385	-3.1062	2.3372	-10.6482	5.31
DBH1STMF	7.52	-2.4090	-3.7110	-1.8746	-14.6107	-0.47
EBL1STMF	7.52	-4.4893	-3.5607	0.2995	-17.1416	-0.23
EBLNRBMF	7.52	-4.5265	-3.5870	-0.2893	-17.7097	-0.88
GRAMEENS2	7.52	-3.6616	-4.0517	2.1219	-11.8856	1.93
GREENDELMF	7.52	-2.6437	-3.5415	-1.5708	-15.3900	-0.24
ICB3RDNRB	7.52	-3.4947	-3.7934	2.2559	-12.3533	2.49
ICBAMCL2ND	7.52	-4.0933	-3.5333	5.6198	-11.1287	5.51
ICBEPMF1S1	7.52	-2.5602	-3.3283	1.7869	-12.6377	3.42
IFIC1STMF	7.52	-3.5668	-3.6656	-2.5440	-17.7602	-2.26
IFILISLMF1	7.52	-3.0274	-3.8405	-0.5867	-14.0906	0.07
MBL1STMF	7.52	-3.0693	-3.4394	1.7275	-13.3130	2.74
PF1STMF	7.52	-3.7705	-3.0195	9.2358	-8.7276	9.97
PHPMF1	7.52	-3.3311	-3.5604	-1.6487	-16.7743	-1.02
POPULAR1MF	7.52	-3.5915	-3.7399	-2.7064	-17.7028	-2.52
PRIME1ICBA	7.52	-4.0048	-3.6718	6.2314	-9.8382	6.07
RELIANCE1	7.52	-2.3159	-3.3578	9.5472	-4.2819	11.39
TRUSTB1MF	7.52	-3.4538	-3.6344	-2.6852	-17.7883	-2.25
Average	7.52	-3.4209	-3.5124	1.8216	-13.6577	2.4086
Standard deviation	0.00	0.7923	0.3708	5.1554	4.1861	5.3572
Maximum	7.52	-1.4385	-2.2129	17.5113	-4.2819	18.1300
Minimum	7.52	-4.6909	-4.0517	-4.1677	-19.4948	-4.2500

Source: Authors calculation

With the use of Fama's decomposition measure, Table 3 displays the breakdown of portfolio returns. The result indicates that all of the funds have negative values due to the fund manager's lack of selection. It therefore shows

that the monies have not provided the benefits of professionalism. It indicates that fund managers have assumed risk that can be diversified and that the additional returns have not offset. Below is a discussion of the elements that make up the Fama decomposition model:

Performance of Risk: As you can see, all mutual funds have negative risk performance information; none have reported good risk performance. In contrast, the 1STPRIMFMF Fund, with a value of -4.6909, exhibits the lowest degree of risk performance, while the AIBL1STIMF mutual fund, with the highest value of -1.4385, demonstrates the most positive performance risk.

Performance of Diversification: Diversification and net selectivity are responsible for performance. The increased profits that investors receive in exchange for taking on diversified risk are measured by diversification. Thus, an effort has been made to investigate the impact of diversity on investment performance. According to Table 3, there is no positive diversification performance. The GRAMEENS2 has the lowest diversification performance, with a value of -4.0517, while the 1STPRIMFMF has the greatest, at -2.2129.

Return of selectivity: A portfolio manager's stronger stock selection skills result in an extra return, which is known as the return from pure selectivity. 10 funds have a negative selectivity performance, whereas 11 funds out of 21 funds have a positive pure selectivity performance, as shown in table 3. With a pure selectivity of 17.51, the 1STPRIMFMF fund has the best performance, while the ABB1STMF Fund has the lowest diversification performance, with a value of -4.1677.

Performance of Net Selectivity: Net selectivity calculates the percentage of return that comes from choosing securities that is higher than the returns that the diversification component contributes. A net selectivity number that is positive signifies better performance. None of the mutual funds in Table 3 have positive net selectivity; instead, they all perform negatively. The ABB1STMF fund has the lowest net selectivity performance value, -19.4948, while the RELIANCE1 mutual fund has the greatest, -4.2819.

Table-4 Performance Analysis of Mutual Funds

Name	Sharpe Ratio	Rank	Treynor Ratio	Rank	Jensen Ratio	Rank
1JANATAMF	-0.35	16	-0.12	14	-0.06	17
1STPRIMFMF	0.20	1	0.10	1	0.15	1
ABB1STMF	-0.46	21	-0.14	20	-0.08	21
AIBL1STIMF	-0.08	6	-0.07	8	-0.01	6
DBH1STMF	-0.37	17	-0.15	21	-0.06	16
EBL1STMF	-0.25	10	-0.08	11	-0.03	11
EBLNRBMF	-0.27	12	-0.09	12	-0.04	12
GRAMEENS2	-0.27	11	-0.07	7	-0.02	10
GREENDELMF	-0.31	13	-0.14	19	-0.05	14
ICB3RDNRB	-0.21	9	-0.07	6	-0.02	7
ICBAMCL2ND	-0.07	5	-0.02	5	0.02	5
ICBEPMF1S1	-0.15	7	-0.07	10	-0.02	8
IFIC1STMF	-0.37	19	-0.13	16	-0.06	18
IFILISLMF1	-0.34	15	-0.11	13	-0.04	13
MBL1STMF	-0.17	8	-0.07	9	-0.02	9
PF1STMF	0.07	3	0.03	3	0.06	2
PHPMF1	-0.32	14	-0.12	15	-0.05	15
POPULAR1MF	-0.40	20	-0.13	17	-0.06	20
PRIME1ICBA	-0.05	4	-0.02	4	0.03	4
RELIANCE1	0.14	2	0.08	2	0.06	3
TRUSTB1MF	-0.37	18	-0.13	18	-0.06	19
Market	-1.1876		-4.62			

Source: Authors calculation

Additionally, the Treynor Index and Sharpe ratio are computed to assess the 21 mutual funds' performance. The gains produced over the risk-free rate per unit of risk are known as the Sharpe ratio. In this case, risk is assumed to equal the standard deviation of the fund. With the exception of two or three mutual funds, the majority of mutual funds have negative TREYNOR Index and SHARPE ratios.

The industry as a whole had poor performance, according to the Sharpe ratio. The 1STPRIMFMF fund outperformed all other mutual funds, with a Sharpe ratio of 0.20. ABB1STMF, on the other hand, had the lowest Sharpe ratio, at -0.46. RELIANCE1 and PF1STMF both exhibit positive Sharpe ratios of 0.14 and 0.07, respectively. Risk adjusted return, or excess return above risk-free rate per unit of systematic risk implies beta, is shown by the Treynor index. Different mutual fund schemes' Treynor indexes are displayed in Table 04 above. First, 1STPRIMFMF (0.10) has the highest Treynor index, followed by RELIANCE1 (0.08) and DBH1STMF (-0.15).

Despite being an exception to the Sharpe ratio, a greater Treynor ratio should be displayed by a higher Sharpe ratio showing scheme. A greater positive Treynor index value indicates superior performance, according to the Sharpe ratio. As you can see, the Jensen ratio indicated poor industry-wide performance. A positive alpha indicates that the portfolio has outperformed its benchmark, whereas a negative alpha indicates that it has not. The mutual fund that performed the best, 1STPRIMFMF, had a Jensen ratio of 0.15, while ABB1STMF had the lowest, with a Jensen ratio of -0.08. PRIME1ICBA, PF1STMF, RELIANCE1, and 1STPRIMFMF all show positive Jensen ratio indexes, which denote subpar performance in comparison to market return.

This high number indicates the market's outstanding performance. Table 4's overall conclusion is that the majority of the funds have outperformed their passive benchmark. Furthermore, Table 4 shows that, on average, mutual funds in Bangladesh have performed better than the benchmark index during the study period.

Table -5 Correlation of risk adjusted measures

	Sharpe Ratio	*Treynor Ratio*	*Jensen Ratio*
Sharpe Ratio	1		
Treynor Ratio	0.965235057	1	
Jensen Ratio	0.95925423	0.969543268	1

Source: Authors calculation

Table 5 shows the association between each fund's findings from the three variables employed in this study. The results unequivocally show that the values in this table are highly positively connected. This implies that the study's findings align with those of Eling (2008), who claimed that the majority of risk-adjusted metrics show nearly identical fund rankings.

Conclusion

Mutual funds have become a popular choice for portfolio diversification among individual investors. They can effectively address various investor needs; however, proper selection and ongoing monitoring are essential for success. This study examines the performance of 21 closed-end mutual funds over the period from July 2014 to June 2024. Monthly closing prices of the funds were used to calculate monthly returns, which were then compared to market returns. The performance of the selected funds was assessed using several metrics: the Sharpe ratio, Treynor ratio, Jensen's Alpha, R-squared, and

Fama's selectivity measure. The findings reveal that out of the 21 mutual funds analyzed, only 7 (33.33%) outperformed than the benchmark index, indicating they provided better returns than the DSEX, while 14 funds (66.67%) did not. Most funds exhibited a moderate relationship (R^2 ranging from 20%-40%), suggesting that their returns were not heavily dependent on systematic risk (βp). This indicates that managers were assuming a certain level of diversifiable (unsystematic) risk. Some funds, like AIBL1STIMF (2.90%), RELIANCE1 (8.06%), and 1PRIMFMF (8.79%), displayed low R^2 values, which point to high unique risk due to less diversification. Conversely, the GRAMEENS2 mutual fund had a high R^2 value of 33.84%, indicating low total and systematic risk thanks to its well-diversified portfolio. Similarly, ABB1STMF also showed a high R^2 value (24.45%) and low total risk (7.34%).

According to Fama's decomposition measure, all funds recorded negative values, highlighting a lack of selectivity by fund managers. This suggests that the funds did not benefit from professional management, as many managers failed to identify and select undervalued securities to achieve higher returns. Consequently, it appears that the diversifiable risks taken by fund managers were not compensated by additional returns. The analysis shows that most funds underperformed compared to the market based on the Sharpe ratio, with negative performance across the industry, except for 1STPRIMFMF, ABB1STMF, and RELIANCE1. The Treynor ratio identified 1STPRIMFMF, ABB1STMF, and DBH1STMF as the top performers. Meanwhile, 1STPRIMFMF, RELIANCE1, PF1STMF, and PRIME1ICBA indicated positive Jensen ratios, reflecting inferior performance against market returns. Overall, mutual funds in Bangladesh outperformed the benchmark index during the research period. This study faces two primary limitations: a small sample size and an exclusive focus on closed-end funds. Furthermore, a deeper analysis of the portfolio compositions of the mutual funds, along with an examination of the backgrounds of fund managers and asset management companies, could yield valuable insights into their influence on fund performance.

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