

Assessing the Factors Effecting Open Ended Mutual Fund Performance in Pakistan

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ABSTRACT

A mutual fund is a solid investment choice for new investors who may lack the experience and knowledge needed. The main goal of this study was to identify factors that affect the performance of mutual funds in Pakistan. It looked at 100 open-ended mutual funds from 2020 to 2024. The data came from annual reports of mutual funds and the Mutual Fund Association of Pakistan. Researchers analyzed this data using Random Effects Ordinary Least Squares with Fixed Effects. They found that larger mutual funds generally perform better than smaller ones. When liquidity increases, mutual funds tend to excel. Interest rates greatly influence fund performance; therefore, a large cash reserve might lead to lower investment returns. A fund's returns improve when its management invests more of its assets. Better cash inflows also help funds perform better. These funds can gain additional returns through careful management of international investments. However, management fees can reduce a fund's returns. Load fees can also lower the mutual fund's returns. Management fees cut into overall returns, which can deter investors. Research indicates that fund managers should be aware of all elements influencing returns. This knowledge would benefit both mutual fund managers and investors.

Keywords: Mutual fund, Fixed effects, OLS, Random effects, Interest rate, Remittances.

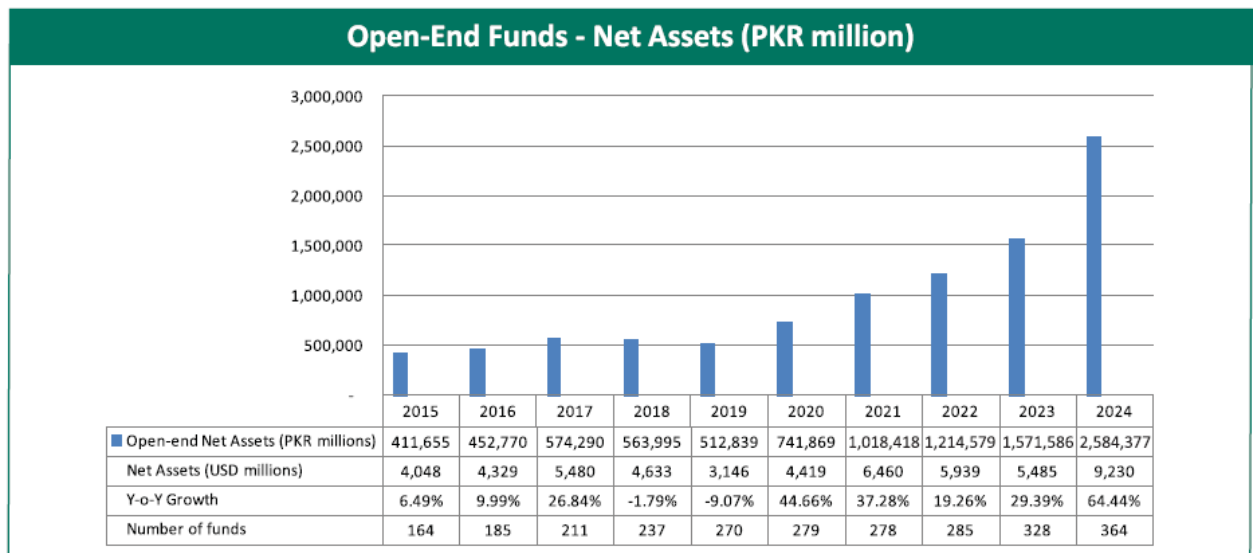
1. Introduction

A mutual fund is an investment instrument that systematically manages funds raised from both individuals and organisations with similar financial aims. Professional money managers help clients achieve their financial goals by constructing a diversified stock portfolio [1]. A significant fraction of portfolios includes a combination of money market instruments, bonds, and stocks. A mutual fund's investment manager collects funds from various clients and strategically distributes them to buy a variety of assets. An effective investment organisation raises capital from investors and distributes it wisely to mutual funds [2]. The investment company will then allocate the investors' capital among shares, bonds, and other favoured assets. If time constraints limit your ability to monitor capital markets, transferring this task to an investment manager may be a realistic option. Investment vehicles known as "mutual funds" collect capital from a variety of participants and distribute it across a variety of assets, including stocks and bonds [3].

Changes in the global economy have resulted in the adoption of mutual funds in both individual and corporate investment strategies. The expansion of these funds in recent decades can be ascribed to investors' need to adequately control risk while seeking to accomplish long-term financial objectives. The investigation of mutual funds continues, fueled by their widespread appeal and the wide range of complex investment options, strategies, and management techniques available. The assessment of fund performance, investor psychology, and fund management are just a few of the themes that have been the subject of research on mutual funds. Friend, Brown [4] conducted the earliest examination into mutual fund performance. The volume of literature makes it difficult to identify overarching trends and extract critical information that would benefit fund managers and investors. Notable researchers who have contributed to the discussion of performance evaluation approaches include Treynor and Mazuy [5], Sharpe [6], Jensen [7], [3], and Grinblatt and Titman [8]. This publication provides a thorough review of the research conducted on the evaluation of mutual fund performance. Sharpe [6] significantly improved mutual fund appraisal procedures. The statistic is based on the market's current position, capital asset valuations, and risk-return probabilities.

The performance of mutual funds is heavily impacted by market conditions. Funds managed by more flexible managers perform better in volatile markets, while those with smaller fees and greater stability produce higher long-term returns. The size of the fund is an important issue; in some situations, smaller funds might provide better risk-adjusted returns. Passive management outperforms factor-based investment in terms of long-term cost-effectiveness and reliability, making it a viable alternative to active management, particularly in inefficient markets with potential for profitability. Investor behaviour has a significant impact on a fund's performance. Psychological biases, such as overconfidence and herd mentality, frequently encourage people to make poor decisions. Market cycles are exacerbated when people invest in funds at inopportune times, influenced by past performance data [9, 10].

In 1962, the Investment Corporation of Pakistan (ICP) was established with the goal of establishing Pakistan's mutual fund. The Mutual Fund Association of Pakistan (MUFAP) has listed 323 open-ended mutual funds, demonstrating the market's rapid expansion. Investors are confident in the industry's exceptional expansion, which is due to its established reputation as a low-risk and safer investment alternative. Over time, a variety of instruments and approaches have been used to evaluate the performance of mutual funds. As a sort of collective investment plan, open-end mutual funds issue new units and redeem existing ones on a regular basis to meet the needs of their investors. They are sometimes referred to as unit trusts. The Offer or Redemption Price, which is determined by the current Net Asset Value (NAV), is the price at which investors and unit holders can purchase or sell the fund's units. The Asset Management Company or one of its distributors can facilitate the direct acquisition or sale of these units. The asset worth of the 366 open-ended funds totalled \$2584.38 billion. Over the course of a year, a significant increase of 64% was seen.



Source: MUFAP 2024 yearbook

Figure 1. Growth of open-ended mutual funds over the past ten years.

Mutual funds make optimal use of both individual and institutional savings and investments. The growing trend in fund growth within the financial market. Hsieh, Tebourbi [11] implies that investors are very interested in this investment approach. Research conducted in 2006 found that the entire value of mutual funds in Pakistan was 171 billion rupees, or \$2.38 billion. In 2009, the private sector had 44 open-end mutual funds and 22 closed-end funds. Pakistan's mutual market has grown significantly since 1962. This suggests that investors are confident and optimistic about the performance of funds and their potential results. The majority of studies on mutual fund profitability have used traditional criteria, with a focus on emerging economies [2, 12-16]. In industrialised countries, sophisticated approaches for evaluating mutual funds are frequently used. Evaluations of fund performance in emerging markets have rarely used the four and three Carhart criteria within the French methodological framework. Rehman and Baloch [15] used the Capital Asset Pricing Model (CAPM) and fund-of-fund performance criteria to evaluate the funds' performance. Pakistani funds' performance was evaluated against known industry benchmarks such as the Treynor ratio, Sharpe ratio, and Jensen's alpha [17]. But the focus of the current study is not on the performance measures but on the general factors affecting the financial performance of the open-ended mutual funds operating in Pakistan.

In the present research, we focused on the six main variables that can impact the performance of mutual funds; these factors include size, liquidity, management fee, remittances, interest rates and cashflows. Present research is organized in five sections. The first consists of an introduction followed by a literature review. The third section consists of research methodology, preceded by a discussion of results, and the last section consists of a conclusion and future course of action for further research.

2. Literature Review

Sharpe [6] proposed the "reward to variability ratio," which is a conceptual measure that evaluates both risk and average return simultaneously. The measure's effectiveness was examined using a sample of 34 open-ended funds. The investigation focused on annual returns from 1954 to 1963, as well as an analysis of standard deviation as a measure of yearly risk. Despite being far smaller than the Dow Jones portfolio, 34 funds were recognised as having a positive reward-to-variability ratio. A Dow Jones portfolio outperformed standard mutual funds, according to the Mutual Fund Industry.

Treynor and Mazuy [5] established the beta coefficient as an alternative method of estimating collective risk. He claims that using naïve diversification reduces unsystematic variability in portfolio results. This leads him to argue that assessing a portfolio's return must take into account its systemic risk. Treynor and Mazuy [5] created a test in 1966 to assess investment managers' ability to foresee market behaviour. The study looked at the investment performance results of 57 investment managers to investigate the concept of market timing competence. Nonetheless, it found no statistical evidence that any of the managers of the examined funds had successfully predicted market moves. The investigation found that investment managers were able to find inexpensive assets, but they did not beat the market as a whole. Jensen conducted a thorough investigation of 115 mutual funds that operated between [7]. According to his study, these funds are likely to outperform a buy-and-hold strategy in the markets.

There were a few indications that a given fund may outperform expectations solely owing to random chance. Jensen [7] defines performance as a rate of return that exceeds the Capital Asset Pricing Model's mandated equilibrium rate. Jensen's metric is based on the capital asset pricing principles developed by Sharpe [18] and Treynor [19]. Keith V. Smith and Tito [20] analysed 38 mutual funds from 1958 to 1967 and evaluated their performances. McDonald [21] investigated the outcomes of 123 mutual funds selected and examined between 1960 and 1969. He discovered that mutual funds performed better than the local "Buy and Hold" strategy. Fama [3] proposed new methods for evaluating investment success, dividing them into four categories: stock selection, market timing, diversification, and risk tolerance. He discovered a method for distinguishing between the portion of an investment return that results from managers' ability to select stocks at a predetermined level of risk and the segment that results from their ability to foresee variations in market price. Dunn PC and RD [22] examined 201 institutional portfolios based on their performance over the years 1973 to 1982, eliminating fund risk variables. No evidence was discovered to suggest that the funds consistently performed well within the same quartile over ten years. Furthermore, the investigation indicated anomalies in managers' rankings based on five-year compound returns.

Assessing the severity of unfavourable outcomes is a strategy for determining the risk associated with a specific action or event. Every risk category has unique opportunities, anticipated consequences, and mitigation techniques [23]. Abideen and Zeeshan Ahmed [12] suggest that classic risk measurements such as standard deviation and beta can be utilised to assess risk exposure. The core idea of modern portfolio theory (MPT) is that investors can maximise their returns by picking the best combination of assets that matches their risk tolerance [24]. The purpose of this study is to see if mutual funds in Bangladesh can maximise efficient portfolios by weighing risk and

performance. Despite Markowitz's categorisation of variance as a risk measure, this study will use standard deviation as a risk metric, as did [25]. In contrast to alternative investment outlets such as shares, bonds, or treasury bills, when making investment decisions, people tend to prioritise risk and return evaluations for mutual funds. While mutual funds provide various benefits, they are not without risk. Three types of risk exist: fund-specific, systemic, and negative performance. The risk associated with the mutual fund is determined by a variety of macroeconomic factors, including GDP growth, inflation, unemployment, and fiscal and monetary policies. The success of a country's mutual funds is affected by its economic progress [26]. When contemplating mutual fund investments, the size of the investment and the potential tax benefits are the two most important aspects to consider.

According to Hasan (2017), the disparities between mutual funds go beyond size and type. They have different goals, structures, expenses, and levels of risk involved with their investments. Investors in mutual funds benefit from competent management. In the last two decades, the mutual fund business has expanded rapidly. Experts continue to disagree on the risk levels associated with mutual funds and their performance relative to market benchmarks (Hussain, 2017). According to Pant [27], mutual funds do not give appropriate investment advice; however, there is a substantial relationship between saving habits and the investor's age. Age, gender, educational level, income, and savings all have an impact on socioeconomic position. [28] investigated investors' attitudes towards mutual funds, emphasising factors such as yield, tax benefits, and capital appreciation, even though many do not have a thorough understanding of these funds or their many plans, including SIP. Singh and Singh [29] state that investors value balanced debt funds. Fund investments aim to preserve money, ensure a secure future, generate consistent returns, and increase the overall value of the investment portfolio. A considerable proportion of people prefer to keep their money in banks rather than mutual funds. According to Vidal, Vidal-García [30], investors evaluate mutual funds based on a variety of characteristics. A large percentage of investors were ignorant of the mutual fund scheme, most likely due to their familiarity with more traditional investment methods, including bank and postal savings accounts. Individuals have historically invested in mutual funds for less than three years before withdrawing their funds, as these investments failed to provide significant returns, which was the program's primary goal. Furthermore, a large number of people who invest in mutual funds require the aid of brokers and agents to complete their transactions. [31] explored investors' perceptions and feelings toward mutual funds.

A statistically significant link exists between age, educational level, and familiarity with mutual funds. Nonetheless, interest in mutual funds appears to be independent of employment issues. The study discovered a substantial association between age, gender, and the reasons people invest in mutual funds. According to the survey, investors valued mutual funds' flexibility and the possibility of tax savings the most. Individuals who expressed an interest in investment stated that their hesitation arose from a lack of understanding about mutual funds. According to Dawson and Henley [32], people aged 35 to 44 prefer to invest in moderate-risk mutual funds to boost their financial progress. The next section includes revenue and balance allocations. Individuals aged 25 to 34 had similar outcomes. Individuals over the age of 45 who are hesitant to take risks, on the other hand, frequently choose mutual fund schemes that guarantee the security of their money. There are two types of funds: balanced and growth.

Inflation is the progressive rise in the prices of a nation's products and services over time. Inflation affects numerous sectors and activities in the economy, both directly and indirectly [9]. It has been proposed that it affects a variety of economic parameters, including interest rates, unemployment, investment, and currency exchange rates. [33] observed that when an economy lacks stability, investors lose trust in it. This is due to the increased market risk often associated with a faltering economy. This means that the investor's shares are likely to lose value over time due to the high-risk premium. During economic downturns, investors typically cut their contributions to mutual funds until the value of their equities reflects the current economic risk. This is related to their unwillingness to take risks altogether.

Many investors put their money into mutual funds that offer a high rate of return. A fund's performance can be influenced by a range of characteristics, including size, returns, turnover, age, loading, fees, and other charges. The majority of funds fail to outperform the market. It is noted that many investors have the ability to make significant profits. Investors' selection of funds and their desire for better performance results are frequently influenced by the historical success of fund performance. Numerous scholars have investigated the effect of mutual fund size on its performance. According to Bertoni, Brtmetti [34], large fund sizes always result in higher costs, which have a negative impact on the fund's performance.

The practice of delivering money from local sources to international recipients, such as family members, is known as a "remittance." Considering the discussions thus far, the selected macroeconomic indicators are regarded as the most relevant for Pakistani mutual funds in terms of risk and risk-adjusted performance. However, research on the relationship between macroeconomic data and the risk and risk-adjusted performance of mutual funds is lacking. As a result, further work in this area is required. Kariuki [27] discovered that inflation has a favourable effect on the performance of Kenyan mutual funds after examining the impact of macroeconomic variables. Kenyan mutual funds' performance is heavily influenced by a variety of macroeconomic factors, including GDP, inflation, interest rates, the money supply, and currency fluctuations. Several variables influenced mutual funds' success and limitations in the Kenyan economy. Kariuki's (8) regression analysis found the money supply, GDP, interest rates, and inflation as the most important variables. The variations in the country's currency rates played a key role in the negative outcomes.

2.1 Research Model

The following research framework was developed in light of the above review of the literature.

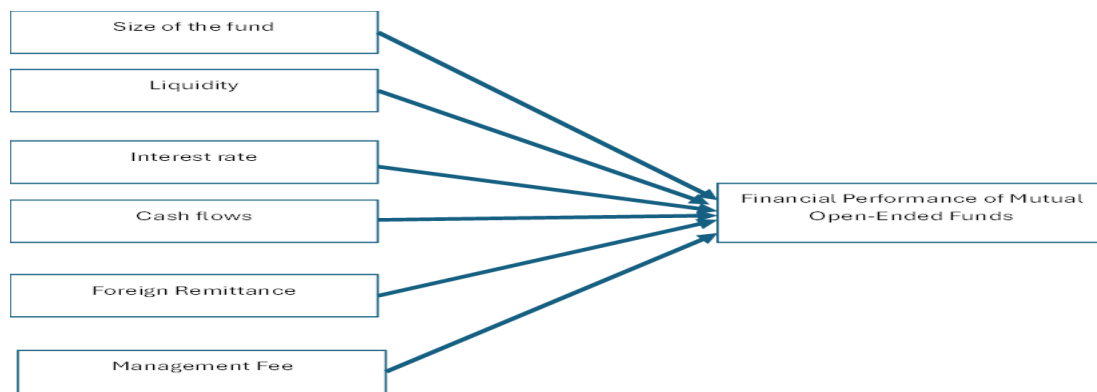


Figure 2. Research framework

2.2 Research Hypothesis

Based upon the above review of literature, the following hypotheses are formulated:

H0: The size of Pakistani mutual fund adversely impacts its Performance.

H1: The size of Pakistani mutual funds positively impacts their performance.

H0: The liquidity of Pakistani mutual funds adversely impacts their performance.

H1: The liquidity of Pakistani mutual funds positively impacts their performance.

H0: The higher interest rate in Pakistan adversely impacts the performance of mutual funds.

H1: The higher interest rate in Pakistan positively impacts the performance of mutual funds.

H0: The cash flows of the Pakistani mutual fund adversely impact its Performance

H1: The cash flows of Pakistani mutual funds positively impacts its Performance.

H0: The higher foreign remittance in Pakistan adversely impacts the performance of mutual funds.

H1: The higher foreign remittance in Pakistan positively impacts the performance of mutual funds.

H0: The management fee of the Pakistani mutual fund adversely impacts its Performance

H1: The management fee of Pakistani mutual funds positively impacts their performance.

2.3 Research Model:

Financial performancne of fund = $\beta_0 + \beta_1$ Fund size + β_2 Liquidity + β_3 Interst rate + β_4 Cash flows + β_5 Foreign Remittance + β_6 Management Fee + e

3. Research Design

This quantitative investigation used secondary data from the World Bank database as well as MUFAP-selected mutual funds. A random selection technique was used to choose 100 open-ended funds for this investigation. The researchers used Stata to analyse panel data (2020-2024) from 100 open-ended funds, using a fixed effect-random effect OLS model.

4. Results and Discussion

In many circumstances, people neglect quantitative data. Using regression analysis on heteroscedastic data can result in biased coefficients and erroneous results. Prompt action must be taken to safeguard your data from this attack. A scatter plot is a useful tool for validating results in regression analysis. If your graph resembles the previously described rough cone scenario, you can conclude that it is heteroscedastic. Regression analysis has great value. A data point that deviates

from the regression line is classified as a regression error. A homoscedastic dataset shows consistent error variance across time. Practical implementations in this scenario are uncommon, especially in theoretical academic settings. Adrian Pagan and Trevor Breusch created the Breusch-Pagan test in 1979, which detects heteroskedasticity in a linear regression model. The Cook-Weisberg test has evolved significantly since its initial release in 1983 by R. Dennis Cook and Sanford Weisberg. The Lagrange multiplier test is based on the idea of using the values of independent variables to adjust the variance of regression errors. In these cases, heteroskedasticity is clear. Given that the test results exceeded the threshold value, the table shows that there were no non-constant oscillations.

The Breusch-Pagan test was used to determine the presence of heteroscedasticity in the dataset. The test values for the data exceed the critical value, showing that there are no concerns about non-constant variability. The details of which can be found in table1below:

Table 1. Breusch-pagan test

Test	Critical value	Reported Value
Breusch-Pagan Test	0.05	0.001

Multicollinearity is the substantial correlation that can emerge between independent variables in research attempts. In a regression model, linearity refers to the relationship between independent variables. This poses a challenge because independent variables are assumed to have no correlation. When there is a strong correlation between the variables, fitting and interpreting the model might be difficult. Researchers have demonstrated that multicollinearity exists in data when the correlation between two independent variables is greater than 0.80. The multicollinearity analysis indicates that a regression model with a VIF score greater than 5 is susceptible to multicollinearity difficulties. The data show that multicollinearity does not exist, as all variables in this investigation have values much lower than the crucial threshold. The details of which are stated in Table 2 below:

Table 2. Multicollinearity test

Variables	V.I.F
Size of the fund	2.01
Liquidity	1.93
Interest rate	2.56
Cash flows	1.89
Foreign Remittance	1.66
Management Fee	2.98

4.1 Fixed Effect Model

Table 3. Fixed effect

Sharpe Ratio (returns)	Coefficient	Std. Error	T-Value	P. Value
Size of the fund	0.996	0.078	1.698	0.032
Liquidity	0.325	0.056	1.556	0.096
Interest rate	-0.213	0.088	-1.991	0.034
Cash flows	0.188	0.075	2.362	0.039
Foreign Remittance	0.221	0.631	1.894	0.018
Management Fee	-0.101	0.799	-1.561	0.098
F. Value = 16.36		R-squared = 0.416		

The fixed effect shown in Table 4 below indicates that all factors contribute favourably to mutual fund performance, with the significant exception of interest rates and management fees. The data show that larger mutual funds outperform smaller ones in terms of performance. According to the findings, mutual funds perform better when their expenditure ratio is higher. Funds strive to maintain adequate liquidity to meet the demands of investors looking to dispose of their shares while keeping the nation's government and economy stable. This shows that liquidity is critical to enhancing fund performance and that larger cash reserves lead to higher investment returns. Contrary to popular assumption, mutual fund investors prefer funds with adequate liquidity, implying that a large amount of the money should be distributed. The fund's performance fell in response to rising interest rates, as investors expected larger returns while borrowing costs rose.

A greater fund returns correlates with fund managers allocating resources more quickly and efficiently. This result can be attributed to capital flows' positive impact on fund performance. This study found that management fees have a significant negative influence on fund performance. This shows that investors are becoming more unwilling to give capital to funds with high management fees, as these charges diminish overall returns. This reduces the potential for profit-generating from investments. The quick decrease of the Pakistani rupee in relation to other currencies may give the beneficiary more options to invest in mutual funds. This could help to clarify research findings that show that remittances from overseas improve returns. The significant increase in Pakistan's foreign remittances over the last five years cannot be ignored.

The model is highly significant, as demonstrated by an F-value of 16.36. The R-squared value of 0.416 indicates that the independent factors influenced the dependent variable (fund return) in this study to the tune of 41.6%.

4.2 Random Effect Model

Table 4. Random effect

Sharpe ratio (returns)	Coefficient	Std. Error	T-value	P.value
Size of the fund	0.312	0.206	1.99	0.041
Liquidity	0.216	0.121	1.61	0.841
Interest rate	-0.013	0.079	-1.693	0.713
Cash flows	0.166	0.049	1.88	0.056
Foreign remittance	0.036	0.029	1.055	0.795
Management fee	-0.051	0.043	-1.32	0.698
Wald Chi 9.62		R-Squared 0.39		

The random effects model results show that all variables have a positive impact on mutual fund performance, with the exception of interest rates and management fees. According to the research, larger mutual funds outperform smaller ones. Mutual funds' performance tends to improve as liquidity grows. The impact of interest rates on fund performance is significant, implying that having a bigger cash reserve may result in worse investment returns. As fund managers allocate more of their assets, the fund's returns improve. Cash flows have a beneficial impact on the fund's performance. The careful management of these funds demonstrates how foreign remittances increase their return on investment. The management fee will reduce the fund's return on investment. The introduction of load fees by fund management would reduce the mutual fund's return on investment. Investors are unlikely to support any management fee because it would diminish their overall return. The F-value provides a clear indication of the model's importance. The Wald chi-square statistic measures the model's relevance. The R-squared number indicates that the independent factors account for approximately 39% of the variation in the dependent variable, which is fund performance.

4.3 Hausman Test

The Hausman test examines the accuracy of estimators in panel data analysis by analysing various assumptions about the correlation between regressors and individual effects. This allows you to determine whether the model is superior: a random effects model or a fixed effects model. A low Hausman statistic suggests that the fixed effects model is the superior option. If the size increases, the random effects model performs better. Stata's "Xtreg" function finds linear regression models that work with panel data, which is data that displays the same people or things over multiple time periods. Users can utilise fixed effects, random effects, or between effects to estimate models with several variables. For example, "fe" denotes fixed effects, "re" random effects, and "be" between effects.

Table 5. Hausman test

β = consistent under H_0 & H_a ; obtained form Xtreg
β = Inconsistent under H_a , efficient under H_0 ; obtained form Xtreg
Prob > Chi ² = 0.039

As indicated by the results of the Hausman test in Table 5 above, the fixed effect model can be used instead of the random effect model since the data demonstrates a fixed effect, and the Hausman probability value is less than 5% (0.05).

5. Conclusions

Mutual funds serve as an important benchmark in the current financial environment for small investors, especially those who lack the skill, understanding, or capacity to participate in the capital market. This study examined one hundred open-ended mutual funds in Pakistan to determine the elements that influence their performance. The study's analysis included both fixed and random factors. The findings show that different mutual fund parameters have varying influences on mutual fund performance. The findings indicate that a larger fund is connected with a higher return. According to research, larger funds attract a greater number of trustworthy participants, which improves fund returns. Capital flows, remittances, and liquidity all have an impact on mutual fund performance, but interest rates and management fees don't. According to the findings, mutual fund managers and investors would benefit from a logical process for examining the factors that influence fund performance.

Subsequent research on mutual fund risk and risk-adjusted returns may include additional macroeconomic variables such as inflation and exchange rates to assess their impact on these metrics. Researchers and practitioners can use the 12-month rolling window method to quantify risk and risk-adjusted return from a holistic perspective. In the final phase, panel data analysis approaches would allow for the evaluation of the ideal scenario about the impact of micro and macroeconomic variables on the risk and return associated with mutual funds. This will take into account both the temporal and spatial factors. Future researchers may use data collected weekly or daily to potentially extend the study's duration from ten to twenty years. The model developed in the study has the potential to be used in a variety of stock market analysis applications.

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Conflicts of Interest

The author confirms that there are no conflicts of interest.

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