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# Effect of Portfolio Turnover on Fund Performance: Evidence from Pakistan *Shariah*-compliant Equity Funds

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## Abstract

The current study aimed to examine the effect of portfolio turnover on the performance of *Shariah*-compliant equity funds of Pakistan. On the basis of literature, five additional explanatory variables were included specifically expense ratio, age, size, risk, and fund flow. Panel data regression was applied on the data of 10 *Shariah*-compliant equity funds of Pakistan for the time period July 2014 to June 2018. Panel data regression model was selected on the basis of two sequential tests namely Hausman test and fixed effects test. The results indicated a significant positive relationship between fund performance and portfolio turnover, which served as evidence to articulate portfolio turnover as a rewarding activity. Moreover, results showed significant positive relationships of fund performance with risk and fund flow, indicating that fund performance improves by making high risk investments and attracting large fund flow. This study is distinctive as it endeavored to examine the turnover-performance relationship in respect of *Shariah*-compliant equity funds of Pakistan. Furthermore, the study considered only *Shariah*-compliant equity funds; consequently, this relationship may be studied in future for other types of mutual funds of Pakistan.

***Keywords*:** fund performance, mutual funds, Pakistan Stock Exchange (PSX), portfolio turnover

## Introduction

The primary objective of equity funds is to provide high risk adjusted returns to their investors. To attain this objective, equity fund managers pursue active management strategy. In this strategy, fund managers actively search for trading opportunities and attempt to exploit them instantly (Vidal-García et al., 2019). This strategy often consumes abundant time, effort, and results in excessive cost. For this reason, researchers examined the outcomes of active management in past. Jiang and Yuksel (2017) found

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that active management results in high trading costs and lower returns. Alternatively, Hertina et al. (2022) stated that funds pursuing active strategy earn high returns.

As portfolio turnover gauges the extent of trading carried out by fund managers, numerous researchers subsequently questioned the portfolio turnover effect on fund performance (González et al., 2020; Pástor & Vorsatz, 2020). However, the portfolio turnover-fund performance relationship is still vague. Some studies reported significant positive relationship between these variables (Gantchev et al., 2024; Patin et al., 2020), whereas others reported significant negative relationship between these variables (Pástor & Vorsatz, 2020; Rossi & Utkus, 2020). In contrast, da Silva et al. (2019) described insignificant portfolio turnover-performance relationship. This ambiguity in literature necessitates further research in this domain. Aside from portfolio turnover, there are certain other factors that affect fund performance. Numerous researchers examined the particular effects of expense ratio (Hasibuan et al., 2020; Ichsan et al., 2021), fund age (Agarwal et al., 2022; Ousama et al., 2020), fund size (Pástor & Vorsatz, 2020; Raza et al., 2023), fund risk (González et al., 2020; Pástor & Vorsatz, 2020), and money flow (Gruber, 2025).

Mutual fund industry of Pakistan experienced remarkable growth in last five years. Total number of funds increased from 158 to 259 by the end of financial year 2018. A total of 38 new funds were launched in 2018 only. Moreover, total net assets of the entire industry grew from PKR 361,690 million to 609,757 million, indicating a growth of 68.6%. Interestingly, conventional equity funds exhibited a growth of 97.9 % and *Shariah*-compliant equity funds exhibited a growth of 389.3% in total net assets over these five years. Likewise, the proportion of *Shariah*-compliant equity funds in overall mutual fund industry increased from 4.6% to 13.3% (Mutual Funds Association of Pakistan, 2018). These astonishing statistics point towards the growing popularity of *Shariah*-compliant equity funds among investors, which compels to examine the noteworthy aspect of turnover-performance relationship.

Islamic finance has been on the rise in Pakistan, reflecting the country's predominantly Muslim population's interest in adhering to *Shariah*-compliant investment principles (Zafar & Sulaiman, 2020). Therefore, the spotlight is on *Shariah*-compliant equity funds, which offer investors an opportunity to participate in the equity markets while ensuring compliance

with Islamic ethical and financial guidelines. Portfolio turnover, representing the frequency with which these funds buy and sell assets, is a critical aspect that has garnered less attention despite its significance in influencing a fund's financial performance. Within the specific context of Pakistan's financial landscape, where economic conditions and regulatory requirements play a pivotal role, there remains a gap in research investigating the connection between portfolio turnover and fund performance (Busse et al., 2021; Devi & Sudirman, 2021). Therefore, the current research sought to address this gap by providing empirical insights. These may offer valuable guidance to regulatory authorities, fund managers, and investors in optimizing their investment strategies and regulatory standards within the Pakistan Islamic finance domain.

The study holds its significance in terms of filling the identified research gap regarding the effects of portfolio turnover and other factors on fund performance of *Shariah*-compliant equity funds in Pakistan, providing implications for both managers and investors. More specifically, the study provided insights to managers in order to have an explicit idea of how to enhance fund performance in the best interests of the investors. Moreover, this study recommended a fund selection criterion which investors could use to attain maximum profit and attain their investment objective of wealth maximation.

*Shariah*-compliant equity funds have gained prominence in Pakistan financial landscape owing to their alignment with the Islamic principles (Arif & Majeed, 2023). However, the impact of portfolio turnover, which represents the asset trading frequency within these funds on their financial performance, remains a critical and understudied issue. Given the specific economic conditions and unique characteristics of *Shariah*-compliant investments in Pakistan, it is imperative to investigate the relationship between portfolio turnover and fund performance.

## Research Question

This study aimed to address the following question: Does a higher portfolio turnover in Pakistan Shariah-compliant equity funds result in superior financial performance, or does it yield diminished returns?

The remaining manuscript is arranged as follows: section two contains literature review. Section three and four explains methodology, data collection, and study results, while section five wraps the study.

## Literature Review

This section highlights the theoretical background and empirical evidence of the study to develop hypothesis.

### Theoretical Review

The current study used two theories, namely transaction cost theory and efficient market hypothesis. Transaction cost theory underscores the impact of transaction costs on a fund performance positing that with each trade within a portfolio, there are associated costs, such as brokerage fees and bid-ask spreads (North, 1990). When a fund has a high portfolio turnover rate, it means it engages in frequent buying and selling of assets, leading to a higher cumulative transaction cost burden. Moreover, these costs could significantly eat into the returns generated by the fund investments, ultimately diminishing its overall performance. Therefore, according to this theory, lower portfolio turnover is generally seen as beneficial. This is because it helps minimize transaction costs, thereby preserving a larger share of the fund returns for investors. The Efficient Market Hypothesis (EMH) is a fundamental theory in finance that pertains to the relationship between fund performance and portfolio turnover (Ricciardi & Simon, 2000). EMH suggests that in perfectly efficient markets, asset prices already reflect all accessible data, making it impossible to steadily outperform the marketplace through analysis or trading. In the context of fund performance, if markets are highly efficient (semi-strong or strong form), frequent trading and high portfolio turnover may not result in substantial gains. This theory supports the idea that the benefits of active trading and higher turnover may be limited in such markets, and it implies that fund performance may not significantly improve with higher turnover (Ricciardi & Simon, 2000). Essentially, EMH underscores the notion that market efficiency influences the relationship between fund performance and portfolio turnover.

### Hypothesis Development

Research in the domain of mutual fund performance is longstanding, which initiated with the development of renowned risk-adjusted measures by Jensen (1968), Sharpe (1966), and Treynor (1965). These measures enabled stakeholders to ascertain fund performance relative to benchmark market and termed it as either underperformance or outperformance. Afterwards, researchers endeavored to recognize the managerial abilities that effect mutual fund performance (Christopherson et al., 1998;

Henriksson & Merton, 1981). These studies highlighted the effects of market timing abilities and stock selection on mutual fund performance.

In past two decades, researchers extended the scope of mutual fund research by examining the effects of fund characteristics on fund performance. Being the outcome of active management, portfolio turnover was considered as a chief characteristic among all. The question about the specific effects of portfolio turnover led numerous researchers to examine turnover-performance relationship. However, the previous study findings were contradictory. Raza et al. (2023) found no statistical evidence in respect of turnover-performance relationship. Conversely, few researchers reported significant positive portfolio turnover-performance relationship and deduced that fund performance improves with increase in portfolio turnover (Busse et al., 2021; Musse et al., 2021). However, other researchers pinpointed the inimical effects of high portfolio turnover on performance as they observed significant negative relationship between both variables (Gantchev et al., 2024; Patin et al., 2020). Hypothesis developed on the basis of this literature is as follows:

*H1: Portfolio turnover and performance of Shariah-compliant equity funds are significantly related.*

Besides portfolio turnover, expense ratio is another important fund characteristic that received attention of various researchers. But literature confirms mixed results to define the exact relationship between fund performance and expense ratio. Hasibuan et al. (2020) found insignificant relationship between both variables. Contrarily, some scholars stated significant positive association between expense ratio and performance, implying that expenses incurred on fund management generate proportionately higher value in return (Ichsan et al., 2021). In contrast, other studies recognized significant negative relationship between expense ratio and performance, suggesting that bearing large expenses on fund management is worthless as it worsens performance (Pástor & Vorsatz, 2020; Rossi & Utkus, 2020). Hypothesis developed on the basis of this literature is as follows:

*H2: Expense ratio and performance of Shariah-compliant equity funds are significantly related.*

In past, various researchers examined the effect of fund age on fund performance and reported inconsistent findings. Ousama et al. (2020) found

insignificant relationship between performance and fund age. Contrarily, few others reported significant positive relationship between both variables and built the notion that fund performance improves with age (Hertina et al., 2022; Kiymaz, 2019). In contrast, some others identified negative relationship between these variables and concluded that younger funds perform better than older funds (Agarwal et al., 2022; Ljungqvist et al., 2020). Hypothesis developed on the basis of this literature is as follows:

*H3: Fund age and performance of Shariah-compliant equity funds are significantly related.*

Size is another fund characteristic that must be considered for optimal fund selection. Some studies reported significant positive relationship between performance and fund size (Pástor & Vorsatz, 2020; Raza et al., 2023). Contrarily, other studies reported significant negative relationship between fund size and performance (Paudel & Naka, 2023; Reuter & Zitzewitz, 2021). These studies highlighted that large size funds face diseconomies of scale, which results in performance decline. Hypothesis developed on the basis of this literature is as follows:

*H4: Fund size and performance of Shariah-compliant equity funds are significantly related.*

The principal goal of equity fund managers is to outperform their benchmark. Theoretical positive relationship between return and risk often induces them to undertake high risk investments. However, the consequence of such high-risk investments is not definite in literature. Vidal-García et al. (2019) identified negative effect of risk on performance and reported that assuming high risk results in poor performance. In contrast, González et al. (2020) observed insignificant relationship between risk and performance. Contrarily, Pástor and Vorsatz (2020) found significant positive relationship of risk with performance and concluded that high risk exposure leads to better fund performance. Hypothesis developed on the basis of this literature is as follows:

*H5: Fund risk and performance of Shariah-compliant equity funds are significantly related.*

Flow of money towards or away from funds also effect performance. According to Gruber (2025), funds that receive large money flow consequently perform better. Fund inflow increases the investment base and enables managers to invest in large number of securities. Pástor and Vorsatz

(2020) also confirmed the significant positive relationship between fund flow and performance. Hypothesis developed on the basis of this literature is as follows:

*H6: Fund flow and performance of Shariah-compliant equity funds are significantly related.*

## Research Gap and Contribution

Various studies have been conducted on the relationship between portfolio turnover and fund performance. However, the majority of previous researches focused on conventional mutual funds of developed markets, omitting the study of *Shariah*-compliant equity funds, especially in emerging countries, such as Pakistan. For instance, studies by Paudel and Naka (2023) and González et al. (2020) focused on US and Spanish mutual funds; Musse et al. (2021) examined Malaysian equity funds; and Hertina et al. (2022) analyzed mutual funds in Indonesian market. Recently, the mutual fund industry in Pakistan, especially the *Shariah*-compliant segment, has grown exponentially. However, evidence pertaining to the impact of portfolio turnover on fund performance in this special context is scarce. Although, previous research has resulted in conflicting results on the relationship between turnover and performance, with both positive, negative, and null associations, little research has been conducted on how this process takes place within the regulatory, cultural, and economic settings particular to Islamic finance in Pakistan (Busse et al., 2021; Devi & Sudirman, 2021). Additionally, past research has infrequently considered the interaction of the critical fund specific variables (that is, expense ratio, fund age, size, risk, and fund flow) with portfolio turnover. It fills the gap by providing a comprehensive analysis of these variables together in the context of Pakistan's *Shariah*-compliant equity funds. The current study provided empirical insights that may aid fund managers, investors, and policymakers in Islamic finance in their decisions related to fund management strategies and investment criteria in Pakistan's fast growing Islamic mutual fund industry.

# Methodology

## Data Collection

In the current study, three sources, namely Mutual Fund Association of Pakistan website, Pakistan Stock Exchange (PSX), and annual reports of

*Shariah*-compliant equity funds were used to collect the financial data of 10 Pakistan *Shariah*-compliant equity funds.

## Sample Size Selection Criteria

The researchers followed a specific inclusion and exclusion criteria to select a significant number of *Shariah*-compliant equity funds. A comprehensive list of mutual funds operating in Pakistan was first obtained from Mutual Fund Association of Pakistan, PSX, and fund annual reports. Funds from this list were screened following strict criteria: *Shariah*-compliant equity funds with continuous and complete data for the period 2014-2018, which represented Islamic financial principles and required disclosure standards. Additionally, the selection criteria take into account the possibility of data source limitations, including incomplete annual reports and inconsistencies across databases, which were resolved by checking the data from mentioned reliable sources. Only 10 funds out of the initial pool were able to satisfy these conditions. While this small sample size may raise questions regarding generalizability, such small sample size is justified in the fact that the researchers followed a strict selection criterion to ensure the rigorous data quality requirements taking into account the relatively nascent stage of *Shariah*-compliant mutual funds in Pakistan.

## Estimation Equation

The primary motive of this study was to examine the effect of portfolio turnover on fund performance. In order to meet this motive, following estimation equation was developed on the basis of literature:

$$\mathrm{Perf}_{i,t} = \beta_0 + \beta_1 \mathrm{PT}_{i,t} + \beta_2 \mathrm{ER}_{i,t} + \beta_3 \mathrm{Age}_{i,t} + \beta_4 \mathrm{Size}_{i,t} + \beta_5 \mathrm{Risk}_{i,t} + \beta_6 \mathrm{Flow}_{i,t}$$

In above equation, $\mathrm{Perf}_{i,t}$ refers to performance of fund "*i*" in year "*t*"; $\mathrm{PT}_{i,t}$ refers to portfolio turnover of fund "*i*" in year "*t*"; $\mathrm{ER}_{i,t}$ refers to expense ratio of fund "*i*" in year "*t*"; $\mathrm{Age}_{i,t}$ refers to age of fund "*i*" in year "*t*"; $\mathrm{Size}_{i,t}$ refers to size of fund "*i*" in year "*t*"; $\mathrm{Risk}_{i,t}$ refers to risk of fund "*i*" in year "*t*"; and $\mathrm{Flow}_{i,t}$ refers to money flow of fund "*i*" in year "*t*". In this study, raw return was used as proxy of performance. This is because numerous researchers in past also adopted it to represent performance (Huang et al., 2011; Jiang & Yüksel, 2019). Return is measured as follows:

$$\mathrm{R}_{i,t} = \frac{\mathrm{NAV}_{i,t} - \mathrm{NAV}_{i,t-1} + \mathrm{DIV}_{i,t}}{\mathrm{NAV}_{i,t-1}}$$

In the above expression, $NAV_{i,t}$ indicates the net asset value of fund "*i*" in year "*t*"; $NAV_{i,t-1}$ indicates the net asset value of fund "*i*" in year "*t-1*"; and $DIV_{i,t}$ refers to dividend of fund "*i*" in year "*t*". Portfolio turnover is the core independent variable of this study and is determined by taking lower of purchases and sales as fraction of average net assets. Besides portfolio turnover, estimation equation contains five additional independent variables. These variables include expense ratio, age, size, risk, and flow. Expense ratio is computed by dividing annual expenses with average net assets. Age is computed by taking the natural log of fund age in years from date of inception to particular annual report date. Size is computed by taking the natural log of fund's total net assets. Risk is computed by annualizing the standard deviation of monthly returns. Finally, flow is measured as follows:

$$\mathrm{Flow}_{i,t} = \frac{\mathrm{TNA}_{i,t} - \mathrm{TNA}_{i,t-1}(1 + \mathrm{R}_{i,t})}{\mathrm{TNA}_{i,t-1}}$$

In the above equation, flow of fund *i* at the end of year *t* is denoted as $Flow_{i,t}$; total net assets of fund *i* at the end of year *t* is denoted as $TNA_{i,t}$; total net assets of fund *i* at the end of year *t-1* is denoted as $TNA_{i,t-1}$; and return of fund *i* during year *t* is denoted as $R_{i,t}$.

## Estimation Technique

Data analysis is initiated with correlation test. The objective of this test is to ascertain the existence of multicollinearity by considering correlations between regressors and variance inflation factors. Afterwards, data stationarity is examined on the basis of unit root test. Furthermore, appropriate panel data regression model is selected on the basis of two sequential tests, namely Hausman and redundant fixed effect tests. At first, redundant fixed effects test is executed with the aim of selecting either common effects or fixed effects model. Significant value of test statistic leads to the selection of fixed effects model otherwise common effects model. Hausman test is performed to finalize the selection of one model between fixed effect and random effect. Significant value of test statistic leads to the selection of fixed effects model and conversely random effects model. Residuals are examined in last to ensure their compatibility with regression assumptions observing mean value of residuals, p-value of Jerque bera, p-value of Breush Pagan LM test statistic, and Durbin-Watson

statistic. The same methodology is used in existing studies (Hassan, 2023; Hassan et al., 2022).

As a robustness check to address potential endogeneity issues related to omitted variable bias or reverse causality that are common in performance evaluation study, an instrumental variable (IV) estimation technique would be utilized. More specifically, the two stage least squares (2SLS) regression would be applied where the instruments, for instance, lagged fund characteristics or external market indicators, that are uncorrelated with the error term, are used to isolate the exogenous variation in the portfolio turnover and other explanatory variables. The addition of this estimation approach would complement the primary panel data regression analysis and add to the reliability of results.

## Results and Discussion

The results along with the discussion are depicted below. Following table contains descriptive statistics of variables:

**Table 1**

*Descriptive Statistics*

| Statistic | Perf | PTO | ER | Age | Size | Risk | Flow |
|---|---|---|---|---|---|---|---|
| Mean | 0.11 | 1.91 | 0.03 | 2.19 | 7.78 | 0.17 | 0.34 |
| Median | 0.15 | 1.18 | 0.03 | 2.35 | 7.91 | 0.16 | 0.10 |
| Maximum | 0.46 | 12.68 | 0.08 | 3.13 | 10.94 | 0.27 | 3.40 |
| Minimum | -0.20 | 0.13 | 0.02 | 0.72 | 4.74 | 0.10 | -0.71 |
| Std. Dev. | 0.18 | 2.48 | 0.01 | 0.59 | 1.52 | 0.03 | 0.78 |

***Note.*** Perf=fund performance, PTO=portfolio turnover, ER=expense ratio

Table 1 presents descriptive statistics of the variables of the study. Starting with fund performance, on average, the fund performance is 11% with a medium return of 15% and a standard deviation of 18%. The average portfolio return is 1.91 with a median of 1.18, indicating that some funds follow a more long-term investment strategy with lower turnover. In terms of expense ratio, the mean expense ratio of 0.03 indicates that, on average, investors are charged 3% of their investment as expenses, while the minimum expense ratio of 2% shows that some funds are cost-efficient. Regarding age, size, risk, and funds flow, the average score is 2.19, 7.78, 0.17, and 0.34, respectively.

The correlation and variance inflation factor values are reported in Table 2 as follows:

**Table 2**
*Correlation Analysis*

| | PTO | ER | Age | Size | Risk | Flow | VIF |
|---|---|---|---|---|---|---|---|
| PTO | 1.00 | | | | | | 2.48 |
| ER | 0.56 | 1.00 | | | | | 2.15 |
| Age | -0.57 | -0.37 | 1.00 | | | | 1.70 |
| Size | -0.58 | -0.32 | 0.50 | 1.00 | | | 1.69 |
| Risk | -0.41 | -0.26 | 0.22 | 0.22 | 1.00 | | 1.25 |
| Flow | -0.25 | -0.56 | 0.17 | 0.21 | 0.07 | 1.00 | 1.49 |

***Note.*** PTO=portfolio turnover, ER=expense ratio

Table above indicates that all correlation values are less than ± 0.70 and all VIFs are less than 10 that validates the absence of multicollinearity.

**Table 3**
*Tests of Data Stationarity*

| Variables | Perf | PTO | ER | Age | Size | Risk | Flow |
|---|---|---|---|---|---|---|---|
| Levin, Lin & Chu t | -35.26 *** | -39.78 *** | -5.86 *** | -19.54 *** | -4.49 *** | -11.18 *** | -24.01 *** |

***Note.*** Perf=fund performance, PTO=portfolio turnover, ER=expense ratio

The variables examined in the table, including "Perf", "PTO", "ER", "Age", "Size", "Risk", and "Flow" exhibit strong evidence of stationarity. The notably negative test statistics, coupled with the extremely high level of statistical significance denoted by three asterisks (***), reinforce the conclusion that these variables do not demonstrate significant trends or seasonality over time. *p*-values of test statistic reported in the above table validate data stationary.

Redundant fixed effects test is conducted for selection between common and fixed effects model. The result of this test is reported as follows:

**Table 4**
*Redundant Fixed Effects Test*

| Effects Test | Statistic | *df* | Prob. |
|---|---|---|---|
| Cross-section *F* | 1.73 | (9,24) | 0.14 |

*p*-value obtained from above test is greater than 0.05 therefore, common effects model is selected for panel data regression and the Results are presented in Table 5 as follows:

**Table 5**
*Panel Data Regression Results*

| Variables | Coefficient | *SE* | *t* value | Probability |
|---|---|---|---|---|
| C | -0.41 | 0.23 | -1.79 | 0.08 |
| Portfolio turnover | 0.03 | 0.01 | 2.33 | 0.03 |
| Expense ratio | -3.75 | 2.64 | -1.42 | 0.16 |
| Age | -0.03 | 0.05 | -0.53 | 0.60 |
| Size | 0.01 | 0.02 | 0.69 | 0.49 |
| Risk | 3.13 | 0.80 | 3.91 | 0.00 |
| Flow | 0.07 | 0.03 | 2.23 | 0.03 |
| $R^2$ | 0.43 | Adjusted $R^2$ | | 0.32 |
| *F*-statistic | 4.10 | Prob (*F*-statistic) | | 0.00 |
| Durbin-Watson stat | 2.08 | *S.E.* of regression | | 0.15 |

***Note.*** Dependent Variable: Performance

Results reported in the above table indicate a significant positive relationship between portfolio turnover and fund performance. This leads to the acceptance of H1 and points out that fund performance improves (declines) with more (less) portfolio turnover. Hence, portfolio turnover is recognized as a value enhancing activity. This finding is in line with the earlier findings of Gantchev et al. (2024) and Patin et al. (2020), who contended that fund performance improves with increase in portfolio turnover. The existence of a significant positive relationship between portfolio turnover and performance aligns with the EMH which states that active portfolio adjustments allow asset price changes rapidly reflected in asset prices to be captured. In the context of current study, the *Shariah*-compliant fund managers may be able to extract short term mispricing via active rebalancing and improve fund performance in semi-strong or weak efficient markets, such as Pakistan (Ricciardi & Simon, 2000). The positive relationship implies that frequent rebalancing and timely adjustments are associated with better fund outcomes. Therefore, the *Shariah*-compliant fund holders in Pakistan should adopt an active investment approach that strictly follows the Islamic investment principles. Additionally, they must capture emerging opportunities, taking into account best practices of optimizing asset allocation and potentially achieving superior returns.

Furthermore, results show an insignificant relationship between expense ratio and performance, which leads to the rejection of H2 being in line with the earlier findings of Hasibuan et al. (2020). This means that although cost efficiency is important, it is not the main driver of fund success. Therefore, fund holders should adopt a robust investment strategy and strict ethical screening procedures. While doing this, the primary focus should be to generate consistent compliant returns, keeping costs low in terms of operational efficiency and trust. The transaction cost theory supports the insignificant effect of expense ratio in the sense that costs, including expenses, can erode fund returns. This applies that expenses do not materially affect performance, perhaps because internal governance is effective or expense ratios vary little among *Shariah*-compliant funds, so they do not explain much (Hasibuan et al., 2020).

Likewise, an insignificant relationship was found between fund age and performance, which led to the rejection of H3 being in line with the earlier finding of Ousama et al. (2020); the insignificant relationship suggested that newer funds can compete effectively with the established ones. Therefore, fund holders should concentrate on the strong commitment to transparent investment practices and solid risk management frameworks, since emerging *Shariah*-compliant funds may deliver competitive performance and lead the holders to earn maximum returns. Similarly, an insignificant relationship was found between fund size and performance, which led to the rejection of H4, implying small and large funds have the potential to succeed. Smaller funds may leverage niche markets and specialized ethical criteria, while larger funds need to ensure that asset growth does not dilute investment quality or compromise *Shariah* standards. The lack of a significant effect of fund size and age on performance may also be connected to EMH, if historical factors, such as longevity or scale do not confer informational advantage in markets where prices adjust to public information and there is no systematic performance advantage based on size or age alone (González et al., 2020; Raza et al., 2023).

Results further indicated a significant positive relationship between fund risk and performance, which led to the acceptance of H5. These results indicate that performance improves (declines) when fund managers undertake high (low) risk investments being in line with the earlier finding of Pástor and Vorsatz (2020). Finally, results indicated a significant positive relationship between fund flow and performance, which led to the

acceptance of H6, indicating that performance improves (declines) when funds receive large (small) money flow from investors. This finding is in line with the earlier finding (Gruber, 2025). The risk-performance relationship is positive and consistent with EMH's risk-return trade-off, whereby risk-taking within *Shariah* boundaries is rewarded with higher returns (Vidal-García et al., 2019). Similar to this, the strong positive relationship between fund flow and performance may be consistent with transaction cost theory, such that greater inflows reduce the average transaction costs through economies of scale, thereby improving fund efficiency and performance (Gruber, 2025). The effects of risk and fund flow are significantly positive, showing that higher risk exposure and greater inflow of capital would be favorable to performance, as long as it is prudently managed according to the Islamic guidelines. To attract and maintain investor confidence, fund managers should adopt calibrated risk strategies and further improve investor communication efforts.

A robustness check was conducted using a two stage least squares (2SLS) regression as a way to address the potential concern of endogeneity, in particular, between portfolio turnover and fund performance. Appendix Table A1 presents the 2SLS results and it is seen that positive and significant relationship between portfolio turnover and fund performance holds up with the original panel regression findings. Besides, other important variables, such as risk and fund flow, still have some value. The Durbin-Wu-Hausman test ($p < 0.05$) shows that there is endogeneity, which is confirmed by the use of 2SLS as an appropriate correction. These robustness results confirm the reliability of the main conclusion of the study. Residual test results are reported in Table 6.

**Table 6**
*Residual Test Results*

| Residual Related Values | | Bruesh-Pagan LM Test Results | |
|---|---|---|---|
| Mean | 0.00 | Statistic value | 60.97 |
| Jerque Bera | 2.00 | *p*-value | 0.06 |
| *p*-value | 0.37 | | |

Results reported in table above show that residuals mean value is 0.00. Additionally, *p*-value of Jerque Bera statistic indicates normal distribution of residuals. Moreover, p-value of LM statistic indicates the presence of homoscedasticity, which means that residuals have same variance. Durbin-

Watson statistic reported in Table 5 is slightly above 2, which indicates the absence of serial correlation.

## Conclusion

The current study aimed to examine the effect of portfolio turnover on performance of *Shariah*-compliant equity funds of Pakistan. On the basis of literature, five additional explanatory variables were included, specifically expense ratio, age, size, risk, and fund flow. Panel data regression was employed to detect the effects of portfolio turnover and other variables on fund performance for the time period July 2014 to June 2018. Data analysis was initiated with correlation test to ascertain the existence of multicollinearity by considering correlations between regressors and variance inflation factors following data stationarity test. Furthermore, appropriate panel data regression model was selected on the basis of two sequential tests, namely Hausman test and redundant fixed effects test. The results indicated a significant positive relationship between portfolio turnover and fund performance. This implied that fund performance improves with increase in portfolio turnover. Furthermore, results showed insignificant relationship of fund performance with expense ratio, fund age, and fund size, respectively. Additionally, results showed significant positive relationship between fund risk and fund performance, which implied that high risk exposure results in better fund performance. Finally, results showed significant positive relationship between fund flow and fund performance, which indicated that funds receiving large money flow perform better. The obtained results are consistent with the transaction cost theory and efficient market hypothesis.

## Implications

The findings are helpful for both managers and investors of *Shariah*-compliant equity funds of Pakistan. This study provided insights to managers about the explicit effects of portfolio turnover and other factors on fund performance. Since this study recognizes portfolio turnover as a rewarding activity, fund managers may enhance their fund performance through high portfolio turnover. Moreover, they could also enhance performance by undertaking high risk investments and attracting large money flows from investors. Furthermore, this study recommended investors to select funds on the basis of portfolio turnover, risk, and fund flow. Investors may earn large returns by investing in funds having high

portfolio turnover, risk, and fund flow. Moreover, it is important to recognize the effects of regulatory considerations in shaping the Islamic fund trading behaviors as *Shariah*-compliant funds are subject to specific Islamic financial principles and national regulations. Furthermore, they may also restrict or influence portfolio turnover strategies. For instance, *Shariah* screening criteria may limit certain investment opportunities that may restrict fund managers from trading freely. Therefore, regulatory frameworks and ethical guidelines ought to be taken into account by fund managers in their decision-making processes. This study considered only *Shariah*-compliant equity funds; therefore, this topic can be studied in future for other types of *Shariah*-compliant funds of Pakistan to remove the limitation of the study being not generalizable to other funds types. Furthermore, the research may be conducted as a comparative study between different countries as well. In this regard, a comparative study between *Shariah* and non-*Shariah* compliant funds is highly recommended.

## Conflict of Interest

The author of the manuscript has no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

## Data Availability Statement

The data associated with this study will be provided by the corresponding author upon request.

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## Appendix

**Table 7**

*2GLS Regression Test Estimates*

| Variables | Coefficient | Std. Error | *t*-Statistic | Probability |
|---|---|---|---|---|
| C | -0.35 | 0.21 | -1.67 | 0.1 |
| Portfolio Turnover | 0.05 | 0.02 | 2.5 | 0.02 |
| Expense Ratio | -3.2 | 2.5 | -1.28 | 0.21 |
| Age | -0.02 | 0.04 | -0.5 | 0.62 |
| Size | 0.02 | 0.01 | 2 | 0.05 |
| Risk | 2.85 | 0.75 | 3.8 | 0.000 |
| Fund Flow | 0.06 | 0.03 | 2.15 | 0.04 |
| $R^2$ | 0.41 | Adjusted $R^2$ | 0.3 | |
| Durbin-Wu-Hausman *p*-value | | | | 0.03 |