Impact of Conventional and Shariah Compliant Mutual Fund on the Performance of Pakistan Stock Exchange

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Abstract

This study evaluated the impact of conventional and Shariah-compliant mutual funds on the performance of the Pakistan Stock Exchange from May 2013 to July 2020. The aim is to determine which form of fund has a stronger effect and how conventional and Shariah-compliant mutual funds differ in their impact on the stock market. The monthly data was used from the authentic source of SECP (security and Exchange Commission of Pakistan) and MUFAP (Mutual Fund Association of Pakistan) of 54 mutual funds working in Pakistan. Findings are based on regress testing and obtained by using descriptive statistics, correlation analysis, and regression analysis applying the ARDL bound test to determine the impact of conventional and Shariah-compliant mutual funds on the performance of the variable. Results of this study revealed that the Pakistan Stock Exchange Index is positive and significant with lag periods 1,2 and period 3. Income Fund return has also been positive and significant on the Pakistan Stock Exchange Index with a lag period of 3. Conventional Equity Fund returns are also positive on the Stock market Index with the lag period 1, means shows significant results. The money market fund has also a significant and positive effect on the Pakistan Stock Exchange Index with a lag period of 1. On the other hand Fund of Fund, Assets allocation Fund (Conventional), and all Sum of Shariah-compliant average fund returns against the Pakistan stock exchange Index are insignificant and negative. Shariah-compliant mutual funds and conventional mutual funds combined effect of the Pakistan stock exchange has not been studied by previous researchers

Introduction

Choosing among a variety of investment opportunities and incentives is one of the most difficult tasks facing investors today. There are opportunities to purchase bonds, mutual funds, common stock, and deposit certificates using money. The commitment of funds to one or more assets to be held for a specific amount of time is known as an investment. There are two categories for the expense. Securities that are directly regulated as well as assets that investors have bought and sold are included in the direct investment. According to Knill (2004), the terms "indirect investment" and "corporate investment shares" include the buying and selling of debt securities such as bills, bonds, money market tools, and financial derivatives. Mutual funds, exchange-traded funds, in-investment trust entities, open-ended and closed-end investment firms, and exchange-traded funds are examples of indirect investment forms. Only mutual funds, a popular kind of indirect investments, are of importance to us in our analysis.

Tan (2015) investigated mutual funds that are managed by financial institutions. This kind of investment is renowned for its minimal transaction costs, portfolio diversity, and professional management by an investment manager. These days, investing in mutual funds is considered a strategic move, particularly for small investors who do not have the time or experience to assess the risk of their investments and regular checks. According to Taufiq *et al.* (2019), investors receive a distribution of revenue extracted in the form of return based on the number of units retained. Purchasing and redeeming shares of mutual funds might result in an increase or decrease in available resources.

Because the Funds offer medium- and long-term equity investments, Khalid *et al.* (2010) classified them as high-risk investments. In addition to dividends, we have profited from the appreciation of these stocks. In growth schemes, providing long-term investment yields growth. According to Wermers *et al.* (2014), the Reserve Primary Fund, a single money market fund owned by Lehman trading paper, "broke the dollar," meaning that its net asset value was less than the $1 book per share that investors typically anticipate being repurchased. Subsequently, billions of dollars' worth of investment redemption were announced almost instantly.

According to Alexandri *et al.* (2017), the choice of asset classes that will be available for investment and the percentage of all funds owned by investors that are invested in that class constitute the decision on asset allocation. A large portion of the money allocated to each asset class is referred to as the portfolio weight or component of the portfolio. According to Conlon *et al.* (2007), investing in several small-sized funds in relation to one another achieves the Fund's benefits of diversification. Due to the extremely low yields on hedge funds, these correlations—

which are frequently computed using equally weighted returns on funds—may include a sizable amount of noise. According to Juliana *et al.* (2019), observance of all Shariah values in all actions is an expression of Shariah's qualities. The doctrinal guidelines that underpin Islamic finance and set it apart from conventional financial activities are known as compliance. The term "Islamic Compliant" refers to theological regulations in the Islamic financial sector that separate conventional financial activities from Islamic ones and are based on the Al-Quran and Hadith.

Sharia-compliant income funds, like Sukuk bonds, are designed to provide investors with a consistent source of fixed Islamic income, according to Asad & Siddiqui (2019). Islamic debt products are purchased both short- and long-term.

According to Muttalib (2014), the system's quick improvement has brought attention to how important it is to create a thriving and successful Islamic financial market as well as fully functional capital markets. These are essential elements of any effective regulation of these financial institutions. The Islamic Equity Fund adheres to basic Shariah rules to enable investors with limited reserves to differentiate, according to Shaliza Alwi *et al.* (2019). Mahdzan *et al.* (2017), considered that the Muslims should only engage in direct transactions with clear instructions and should exercise caution when making unknown investments. Because of the unfairness of their procedures and the emergence of social trauma in the form of unemployment, instability, inflation, and environmental degradation, it is advised to stay away from questionable investments.

Muslims should only engage in transactions that are certain, clear, and governed by transparent norms, according to Paldi (2014), and should carefully avoid assets or investments that are uncertain in nature. Investments that are speculative and unpredictable ought to be avoided due to the inherent inequity in their workings and the harm they can bring society, including unemployment, inflation, volatility, instability, and environmental devastation. According to Bakar (2010), a Shariah-compliant fund of funds combines risk aversion with profit-seeking goals. In hedging operations, profit is crucial because it serves as a buffer against potential price swings.

According to Khalid (2017), having financial resources is crucial since the growth of the stock market is crucial for both economic development and for businesses that operate in any nation. Pakistan's stock market performance is measured using a variety of metrics; however, the most generally used and recognised indicator is stock market capitalization, which is found in numerous studies such as (Kanasro *et al.* 2009; Sichoongwe, k. 2016).

The market got some popularity at the start of the 2019, hitting 43557 points, but it soon started to decline, hitting the historical low on October 16, 2018, at 36663 points. Equity funds dominate the market, accounting for the largest proportion of financial services at 37.75 percent. As of March 31, 2019, the Money Market has the second-highest industry share of 36.93 percent, followed by the Revenue Fund with 17.50 percent (Şenocak, 2019).

According to a review of the literature, there hasn't been much research done on the effects of traditional mutual fund components like money market funds, income funds, equity funds, asset allocation funds, and fund of funds, as well as components of Shariah-compliant mutual funds like money market funds, income funds, equity funds, fund of funds, and asset allocation funds, on stock market performance in Pakistan.

Empirical Evidence of Mutual Funds

A substantial correlation has been shown empirically between mutual funds and the stock market. Measuring the effects of different components on Pakistan's stock market performance became reasonable. These included Money Market Fund (MMF), Assets Allocation Fund (AAF), Equity Fund (EF), Income Fund (IF), Fund of Fund (FOF), Shariah Compliant Income Fund (SCIF), Shariah Compliant Mutual Fund (SCMMF), Shariah Compliant Equity Fund (SCEF), Shariah Compliant Assets Allocation Fund (SCAAF), and Shariah Compliant Fund of Fund (SCFOF).

Problem Statement

Investors are only aware of the stocks in which they have invested; these stocks may be conventional or Shariah mutual funds, but they are unclear of the total performance of these funds. Thus, we must assess which fund will perform better and yield more returns while assuming less risk to find the maximum return that can be achieved in addition to the amount of risk assumed for both conventional and Shariah mutual funds. The main objectives of this research are to determine how the performance of conventional and shariah-compliant mutual funds affects the stock market and to assess whether conventional or shariah-compliant mutual funds are better for investment.

Objective of Study

- To evaluate how traditional mutual funds affect the performance of the stock market.
- To examine how the performance of the stock market is affected by mutual funds that comply with Shariah.
- Assessing which type of mutual fund has a stronger impact on the stock market by contrasting the performance of conventional and Shariah-compliant funds.

Significance of Study

- This article seeks to determine how Pakistan's stock market performance is affected by conventional and shariah-compliant mutual funds. The study's conclusions will be beneficial to financial institutions and investors.

- This study serves as a guidance for investors who wish to finance their fund investments in Pakistan's conventional and shariah mutual fund markets.

- This study is also beneficial to people who made financial investments based on Shariah-compliant Islamic principles.

- By using a new approach, the study improves previous research on the subject by establishing a link between conventional and shariah-compliant funds.

Literature Review and Hypothesis Development

Conventional Mutual Funds

Wermers *et al.* (2014) examined the daily money market mutual fund, which saw daily fluctuations at the individual equity class level throughout the September 2008 financial crisis. The data was gently subjected to the empiric approach, which produced new insights into portfolio holdings and investor attributes that constituted a risk in the cash asset pool. It also produced evidence of the time series dynamics and the shifting balance of transactions, and the relationship between characteristic and tail performance was examined using the quantitative regression approach. The theoretical hypotheses during the financial crisis have received significant support from our research.

The difference was found in the development of exchange-traded funds and index mutual funds, all of which used the passive investment approach, in which the manager attempted to replicate the performance of the chosen company, according to Dhabolkar & Reddy's (2019) analysis. Using a study of 16 mutual funds and 14 ETFs from the fund launch to March 31, 2017, this article investigated the ability of mutual funds and ETFs in India to accumulate the selected market index. The results of the regression analysis demonstrate that ETF fund managers were able to construct a portfolio that was more in line with the selected metric than their scale.

Tan (2015) found that Indonesian investors are interested in the performance of the mutual fund and the outcome of the collective equity index. An international strategy was used to choose a sample of 19 equities investment funds from 2011 to 2015 in order to meet the study work's objectives. An approach utilizing panel data analysis has been employed to investigate the impact of said variables on the Return Equity Investment Fund. According to the assessment, there is still volatility in Indonesian equities fund performance, and fund sizes don't significantly affect the fund's efficiency.

According to Shaliza Alwi *et al.* (2019), the traditional banking industry had major US$16 trillion failures during the 2007–2008 financial crisis. Examining the 200 IMFs and CMFs' performance from 2007 to 2015 was the goal of the project. The 2007–2008 financial crisis periods would be contrasted with the subsample period of 2007–2015. All mutual funds were implemented between 2007 and 2015, according to the data. The stakeholders found the results to be very informative when choosing asset funds. The alternate hypothesis that follows was developed based on the literature review mentioned above.

H1: The Conventional Mutual Funds has major impact on the success of the stock market

Shariah Compliant Mutual Funds

Applying this consensus, Muttalib (2014) investigated and put into practice the idea that liquidity was the cornerstone of any organization that included Islamic banks. Both conventional and Islamic financial organizations financed long-term loans and projects with short-term deposit funds in a manner that left them with insufficient capital commitments and made them vulnerable to collapse. Due to liquidity risk, cash flow misalignment was a crucial component of the Islamic financial system for an efficient and responsive Islamic money market. As a result, this study provides a greater understanding of money market instruments, their roles in managing liquidity, and the connections between them and managing liquidity risk.

Sakti *et al.* (2018) investigated the potential for Indonesian investors to gain an edge by shifting their portfolios according to the metrics of their trading partners and selected commodities, such as minerals, cocoa, crude oil, etc. The authors employed continuous wavelet analysis, multivariate generalized autoregressive conditional heterogeneous, Islamic and product indices, and regular time series data from June 4, 2007, to December 30, 2016. The results indicated that the investors may purchase US or Indian Islamic shares in an effort to increase their diversification benefits and are exposed to Indonesian indices that comply with Shariah. The following alternate hypothesis has been formed based on this review of the material.

The goal of Alexandri et al. (2017) was to investigate how asset allocation strategies—such as modaraba deposits, shariah equities, and sukukuk—affected the performance of mixed shariah mutual funds in Indonesia between 2010 and 2013. The samples were seven mixed Shariah mutual funds per year. From 2010 to 2013, a total of 28 Shariah mutual funds comprised the sample. The outcome demonstrated that the mixed performance of the Shariah Investment Fund was influenced concurrently by the policies governing the distribution of assets for Shariah stocks, Shariah bonds (Sukuk), and Modaraba deposits. At the same moment, it was around 52.2% (0.522).

According to Noor (2009), the expansion of Islamic funds has presented new opportunities and difficulties for the financial industry. In recent years, there has been a shift towards unit-linked goods, which are essential for investment partnerships and probably encompass the predator industry as well. Security was provided by general and family takaful for investment items and the main business. The purpose of this post is to go over some of the Shariah concerns with Takaful systems that deal with investments. The alternate hypothesis that follows was developed based on the literature review mentioned above.

H2: Shariah Compliant Mutual Funds Fund does affect stock market significantly

Conventional and Shariah Compliant Mutual Funds

According to Conlon et al. (2007), there is little information available on the manager's return because hedge fund investments are proprietary. A relatively small monthly sample was estimated using the correlation matrix, which produced noise for the construction of a hedge fund portfolio fund. This is an expression of the random matrix theory applied to a cross-correlation matrix C created from hedge fund yield data. The number of elements in which each vector participated was determined using the inverse participation ratio. It was discovered that using this strategy, the predicted and realised risk of a portfolio may be significantly reduced, improving the risk profile of hedging funds in a fund.

According to a study by Taufiq *et al.* (2019), there were differences between Islamic and conventional mutual funds due to their unique features. The output of eight-year Islamic and conventional mutual funds was examined in this study between January 1, 2010, and December 31, 2017. Thirty conventional and Islamic mutual funds were examined. The efficacy of these funds was examined using the Jensen alpha method, the Treynor survey, and the Sharpe survey. Islamic mutual funds outperform conventional mutual funds, according to statistics wrapping empirical results.

The goal of Juliana et al. (2019) was to present an overview and empirical data regarding the ways in which BMT ItQan members understand Shariah to be in line with Murabahah items. Nonetheless, a descriptive analysis methodology was employed, utilising data collection methods such as surveys and interviews. There were 887 ItQan BMT participants in the trial, and 89 samples of responders were involved. The study's findings demonstrated that, despite a number of missing indicators—Murabaha products were not included in the ItQan BMT, and the traded items were not included in the contract when it was signed—members of the BMT felt that the products were Shariah compliant. Islamic law, or shariah, is based on the prophet's divine revelations and traditions, specifically the alQuran and the Hadith.

Usury (riba), gambling (maysir), and uncertainty (gharar) are all forbidden by Shariah. These components are seen in a lot of traditional financial operations. This entails indirectly participating in forbidden activities, which is regarded as serious sin for a Muslim. In response to this issue, scholars of Shariah have established some reasonable parameters within which businesses might conduct their operations and delineated procedures for cleaning up the sinful profits. But it's not a simple process to accomplish. This essay will go through the requirements, procedures, and laborious nature of the Shariah-compliant screening process. It will also suggest a potential course of action to help with the screening process.

Mahdzan *et al.* (2017) sought to investigate the connections between Islamic fanaticism, market sentiment regulation, and sociodemographic factors and Muslim money allocation preferences. The results of survey questionnaires completed by 751 Muslims employed in Kuala Lumpur are reported in this article. We used an ordered probit regression model to analyse the data. Results indicate that Islamic religiosity levels are generally correlated with portfolio allocation, meaning that two religious factors—virtue and obligation—had a significant impact on the allocation of volatile assets in portfolios.

H3:   The Conventional and Shariah Compliant Mutual Funds has jointly major impact on the success of the stock market

Materials and Methods

Data

The purpose of the current study is to examine how stock market performance is affected by conventional mutual funds (CMF) and Shariah-compliant mutual funds (SCMF). A sample period spanning from January 2013 to April 2020 was selected using monthly data. Data will be gathered from secondary sources, such as the Pakistan Stock Exchange and the Mutual Fund Association of Pakistan (MUFAP), using the quantitative research methodology. Descriptive statistics, regression analysis, and correlation analysis will be applied to the data in order to ascertain the effect of the Shariah complaint mutual fund (SCMF) and conventional mutual fund characteristics on the performance variables. To analyse the causal impact, the top five conventional mutual funds—money market, equity, asset allocation, income, and fund of fund—as well as the top five Shariah compliant funds—money market, equity, asset allocation, income, and fund of fund—are selected based on their liquidity as measured by net asset value (MUFAP, 2019).

Variable

Dependent variables

The stock market's success is the dependent variable in this research. The stock market performance will be measured using the market capitalization of PSX as a proxy variable. By encouraging risk sharing between domestic and foreign investors, the stock market's relaxing behavior is expected to lower the cost of equity capital for the liberalizing state (Aziz et al., 2019).

Independent variables

The following are the independent variables connected to conventional funds: **Income Fund (IF):** Income Fund (IF): Indicates the proportion of an asset's fluctuations or fund portfolio that may be understood in terms of index fluctuations. The benchmark for equity and equity is the 100 index (Taufiq et al., 2019). **Equity Fund (EF)**: A fund that invests in what are commonly known as investments in stocks is called an equity scheme or equity fund. According to Khalid et al. (2010), investing in an equity fund is calculated as bringing the fund's net returns into Pakistan's capital market. **Money Market Fund (MMF):** A money market fund is a type of mutual fund that primarily makes monthly calculations using data from the MUFAP database and invests in highly volatile assets such cash, cash equivalent securities, and high debt-based securities with a short-term credit rating (Wermers *et al.,* 2014). **Asset Allocation Fund (AAF):** These funds are available on the market and are determined by taking up the net return mutual funds in Pakistan's stock market. They can invest their capital in any kind of shares at any moment to diversify their holdings (Alexandri *et al.,* 2017). **Fund of Fund (FOF)**: These assets are placed in other mutual funds as a fund of funds. It is determined by looking at Pakistan's capital market's net return mutual funds (Conlon et al., 2007).

The following are some explanatory variables for Shariah Compliant Funds: **Shariah Compliant Income Fund (SCIF)**: Muslim business owners are obligated to ensure that Halal establishments provide their revenues. In Pakistan's capital market, the joint net return funds are utilised to calculate it (Asad & Siddiqui, 2019). **Shariah Compliant Equity Fund (SCEF)**: In the securities of joint stock companies, taxpayers deposit their capital. Buying securities and selling them when their value increases is the main way that capital profits are generated. To compute it, one must access Pakistan's capital market and utilise the net return mutual fund (Muttalib, 2014). **Shariah Compliant Money Market Fund (SCMMF)**: The marketplaces where creditworthy, Shariah-compliant securities with maturities of no more than a year are published or exchanged within financial institutions are known as the Islamic money markets. It is computed by summing up the combined net returns in the capital market of Pakistan (Mahdzan et al., 2017). **Shariah Compliant Asset Allocation Fund (SCAAF)**: Up to 25% of net assets can be allocated to equity, providing investors with Halal support, as long as a sizable portion of non-equity profits are

retained. It is determined by examining the mutual fund net return in Pakistan's capital market (Paldi, 2014). **Shariah Compliant Fund of Fund (SCFOF):** The investment schemes in the Fund's Shariah-compliant portfolio are designed to meet varying risk profiles. It is computed by using Pakistan's capital market's net return mutual funds (Bakar, 2010).

Variable Description

Variable	Description	Measurement
PSXI	Pakistan stock exchange index	100 Index capitalization
IFR	Income fund return	MUFAP Return capital market
EFR	Equity fund Return	MUFAP Return capital market
MMFR	Money market fund return	MUFAP Return capital market
FOFR	Fund of fund return	MUFAP Return capital market
AAFR	Asset allocation fund return	MUFAP Return capital market
SCIFR	Shariah compliant income fund return	MUFAP Return capital market
SCEFR	Shariah compliant equity fund return	MUFAP Return capital market
SCMMFR	Shariah compliant money market fund return	MUFAP Return capital market
SCFOFR	Shariah compliant fund of fund return	MUFAP Return capital market
SCAAFR	Shariah compliant fund of fund return	MUFAP Return capital market

Tools for Data Analysis

First, pairwise correlation and descriptive analysis will be computed. Second, to verify that the variables are stationarity, unit root tests will be used. We'll use PP and ADF for the unit root test. If a value solely tends to change over time, it is said to be stationarity. In contrast, the non-stationary time series' mean, variance, and co-variance all fluctuate over time because it lacks a tendency to return to its long-run average value. The Ordinary Least Square (OLS) approach will be used for the analysis if all the variables are stationary at the same level. When certain variables exhibit stationarity at the level and others exhibit stationarity at the difference, the Autoregressive Distributed Lag (ARDL) model will be utilised. The Johensen test will be used for analysis if any of the variables are not stationary (Shrestha & Bhatta, 2018).

4. Results and Discussion

Table 1 reveals that the closing end stock market provides the mean return of 24144.88 along with the risk of 5877. 737.The minimum and the maximum value of index over the period 11235 and 37541, respectively. Meanwhile, the Shariah compliant fund appears to show the lowest mean return (0.701978) and the lowest

risk (0.3063937). The income fund return is high (7.762198) and standard deviations (4.873931). However, equity fund return seems to be relatively low (1.940549), but high risky (7.901021). The return on money market funds is rather high, yet less risky, and the performance of asset allocation funds and fund of funds appears to be nearly identical. Returns on shariah-compliant income funds are modest yet risky. Returns on shariah-compliant income funds are substantial yet lower risk. The money market fund that complies with Shariah has high returns (6.116593) and a standard deviation of 2.866024. On the other hand, the returns of the fund of funds and the assets allocation fund that complies with Shariah are low but the risk is high. It's interesting that the maximum return for equities funds has been the highest which is 26.56 and Shariah compliant equity fund return lowest return which is -23.74 (Ejaz et al., 2020).

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SXI	91	24144.88	5877.737	11235	37541
IFR	91	7.762198	4.873931	-0.82	23.17
EFR	91	1.940549	7.901021	-18.75	26.56
MMFR	91	6.94967	3.14743	0	18.56
FOFR	91	0.8413187	2.675584	-11.14	9.25
AAFR	91	0.8559341	2.931958	-10.75	8.28
SCIFR	91	6.259121	3.101333	0	13.2
SCEFR	91	1.18022	6.119354	-23.74	21.45
SCMMFR	91	6.116593	2.866024	0	15.17
SCFOFR	91	0.701978	3.355633	-12.38	12.26
SCAAFR	90	0.8842222	3.671229	-13.45	13.05

Variable	LogPSXI	IFR	EFR	MMFR	FOFR	AAFR	SCIFR	SCEFR	SCMMFR	SCFOFR	SCAAFR
LogPSXI	1										
IFR	-0.0046	1									
EFR	0.083	0.0472	1								
MMFR	0.1669	0.6862*	0.0936	1							
FOFR	-0.0535	0.0663	0.6279*	-0.0164	1						
AAFR	-0.0296	0.1273	0.6436*	0.0775	0.8791*	1					
SCIFR	0.0205	0.5868*	0.0591	0.7667*	0.0153	0.0894	1				
SCEFR	-0.05	0.0789	0.6880*	0.0174	0.8967*	0.9109*	0.0456	1			
SCMMFR	0.1547	0.6533*	0.0888	0.9341*	-0.0204	0.0772	0.8337*	-0.0185	1		
SCFOFR	0.0563	0.1458	0.6559*	0.0918	0.8854*	0.9028*	0.1174	0.9700*	0.0577	1	
SCAAFR	-0.0172	0.1659	0.6457*	0.0146	0.8865*	0.8999*	0.0437	0.9619*	-0.0116	0.9526*	1

Table 2 The pair wise correlation examines the relationship between conventional and Shariah mutual funds. It indicates whether or not conventional and Shariah mutual funds are tied to one another. It examines whether or not the performance of the stock market is influenced by conventional and Shariah mutual funds. The values of the correlation coefficients range from +1 to –1. A correlation coefficient of +1 indicates a perfect association between the variables, while a coefficient of –1 indicates a negative relationship. The variables have a strong relationship if the coefficient of correlation is 0.5 or higher; on the other hand, if the coefficient of correlation is less than 0.5, the variables have a weak relationship. If the coefficient of correlation is 0.8 or greater, the variables have a perfect relationship. Mutual funds that comply with Shariah regulations and conventional funds have a flawless and robust partnership. There is a strong correlation between them. In the same way, there exists a strong correlation between the fund returns of Shariah compliant funds and Shariah asset allocation funds. The table shows that there is a very strong link between conventional and Shariah-compliant mutual funds. All of the mutual funds have strong correlation coefficient values, according to the table's overall trend. It indicates that there is a strong correlation between all of the conventional and Shariah mutual funds—that is, they are dependent on one another. Additionally, the table shows a substantial link between IFR and SCIFR, MMFR, and SCMMFR. It also demonstrates the strong correlation between EFR and SCFOFR, SCEFR, FOFR, AAFR, and SCAAFR. SCIFR and SCMMFR are significant with MMFR. (*) value shows significant relationship otherwise in significant (Ejaz et al., 2020).

Diagnostic Test

Multi-co-linearity Test

A statistical technique for figuring out the link between variables that have a cause-and-effect relationship is regression analysis. Regression models with multiple independent variables and one dependent variable are known as multilinear regression models (Uyanık & Güler, 2013).

Variance Inflation Factor

According to O'Brien (2007), a VIF value of 10 or even 40 or higher does not necessarily indicate that multi-collinearity needs to be treated commonly by applying ridge regressions, eliminating some variables, or integrating them into a single index. Even with all of the criticism directed on VIF, it remains a popular method for multi-collinearity detection.

The findings of the ordinary least square regression model are positive and statistically significant. Next, we evaluate the VIF for multicollnearity, and we find a

problem because the value of the VIF is greater than 10. We now exclude certain variables or combine them into a single index, regress the independent and dependent variables, and verify that the VIF, which is less than 10, indicates that there is no multi-collinearity problem.

Heteroskedasticity Test

The heteroscedasticity test, as described by Gujarati (2003), entails regressing the absolute residual value for each independent variable (as a dependent variable) from the original regression equation. The model lacks heteroscedasticity when the regression findings in a statistical test are not significant, and vice versa.

The outcome demonstrates that (Ho: Constant variance) denotes the absence of heteroskedasticity problems. However, all of the independent variables have likelihood significance values greater than 0.05 (not significant), which suggests that none of the independent variables in the model exhibit heteroscedasticity (Penggunaan et al., 2013).

Autocorrelation Test

Durbin-Watson d-statistic

A residual autocorrelation A DW value of roughly 2 indicates that the model is flawless or has no autocorrelation (Shrestha & Bhatta, 2018).

The null hypothesis cannot be accepted or rejected because of the positive autocorrelation indicated by the result of 1.00157. Our regression model exhibits autocorrelation, which we aim to eliminate by subtracting the dependent variable's first-period lag and rerunning the regression.

When the DW Test was run once more, the result was 2.740317, which is close to two and indicates a negative auto correlation. The important variables under test are strong predictors of the behaviours of interest, as indicated by the negative autocorrelation.

Stationarity Test

Dicky-Fuller Test

To determine whether a time series is stationary or non-stationary, the Dicky-Fuller test was utilised. The data has a unit root, suggesting that the time series is not stationary, according to the Dickey-Fuller test hypothesis. The data is said to be stationary if it lacks a unit root. Data to be stationary at a 5% level of significance with a critical value of -1.662, the t-stat value of time series is greater than the critical value means that we can reject the H0 or accept the H1 (Ejaz et al., 2020).

Table 3 Unit root test based on Augmented dickey fuller test

FUND NAME	5% Critical value	Lag (0) t-stat	prob.	Remarks	Lag (1) t-stat	prob.	Remarks
PSXI	-1.662	-3.359	0.005	Stationary	-.541	0.0064	Stationary
IFR	-1.662	-4.823	0	Stationary	-4.259	0	Stationary
EFR	-1.662	-6.127	0	Stationary	-4.903	0	Stationary
MMFR	-1.662	-5.108	0	Stationary	-3.506	0.0004	Stationary
FOFR	-1.662	-0.939	0	Stationary	-7.511	0	Stationary
AAFR	-1.662	-9.447	0	Stationary	-6.312	0	Stationary
SCIFR	-1.662	-5.452	0	Stationary	-3.3	0.0007	Stationary
SCEFR	-1.662	-9.63	0	Stationary	-6.664	0	Stationary
SCMMFR	-1.662	-4.864	0	Stationary	-3.139	0.0012	Stationary
SCFOFR	-1.662	-0.147	0	Stationary	-7.321	0	Stationary
SCAAFR	-1.662	-1.0	0	Stationary	-7.083	0	Stationary

Phillips-Perron test

The Phillipse Perron (PP) test was employed to find the stationarity or non-stationarity of a time series. The findings indicate that all conventional and Shariah mutual funds are stationary at the o and 1 lag period. Therefore, we reject the null hypothesis and accept the alternative hypothesis because all of the variables are stationary and the data is not unit root (Personal et al., 2015).

Table 4 Unit root test based on Phillips-Perron test

FUND NAME	5% Critical value	Lag (0) t-stat	prob.	Remarks	Lag (1) t-stat	prob.	Remarks
PSXI	-3.46	-3.886	0	Stationary	-.485	0	Stationary
IFR	-3.46	-4.8	0	Stationary	-4.8	0	Stationary
EFR	-3.46	-6.106	0	Stationary	-.092	0	Stationary
MMFR	-3.46	-5.477	0	Stationary	-.321	0	Stationary
FOFR	-3.46	-1.128	0	Stationary	-.148	0	Stationary
AAFR	-3.46	-9.617	0	Stationary	-.617	0	Stationary
SCIFR	-3.46	-5.693	0	Stationary	-.487	0	Stationary
SCEFR	-3.46	-9.773	0	Stationary	-.773	0	Stationary
SCMMFR	-3.46	-5.506	0	Stationary	-.319	0	Stationary
SCFOFR	-3.46	-0.112	0	Stationary	-.114	0	Stationary
SCAAFR	-3.46	-9.82	0	Stationary	-.882	0	Stationary

ARDL MODEL

Selection order criteria of appropriate lags period

An autoregressive distributed lag (ARDL) model is a non-stationary and mixed-order time series model based on the ordinary least square (OLS) method. This model employs a suitable number of lags in a general-to-specific modelling framework to reflect the data production process. Based on the (SOC) selection order criterion, the number of suitable lags period will be chosen (Shrestha & Bhatta, 2018).

Table 5 Selection order criteria of appropriate lags period

S.NO	Variable	Lag	AIC
1	PSXI	4	-1.32874*
2	IFR	3	5.64266*
3	EFR	1	6.88779*
4	MMFR	3	4.7743*
5	FOFR	1	4.82548*
6	AAFR	0	5.0431*
7	SSCAVG	0	8.18464*

A mathematical technique called the Akaihe knowledge criterion (AIC) is often used to assess how well a model fits the data that it was constructed on. The AIC statistical method is used to compare numerous models and evaluate which model best fits the data. The Akaike knowledge criterion (AIC) (Akaike, 1974) is a fine-tuned technique for estimating the probability of a model to predict/estimate. A successful model is one that has the lowest AIC of all the models. Better match is indicated by a lower AIC or BIC value. The AIC scores' absolute values have no impact. These results may be either positive or negative. AIC is normally positive; however, any additive constant will change it, and certain changes can result in negative AIC values (Khalid, 2017).

ARDL Conventional & SSCAVG funds (Short run & Long run)

The vital values of Pesaran et al. (2001) are compared to the measured F-statistics from the Wald test. If the measured F-statistics are less than the lower critical values of Pesaran et al. (2001), it is assumed that there is no relationship between time series. If calculated F statistics is among Pesaran et al. (2001)'s lower and higher critical values, it is avoided to make certain commitment and referred to other co integration tests. If calculated F-statistics is upper than bound critical values, it is accepted that there is relationship between time series. In other words, the null hypothesis is rejected (Syam Prasad, 2013)

Table 6 ARDL Conventional & SSCAVG funds (Short run)

LogPSXI	Coef.	Std. Err.	T	P>|t|	[95% Conf. Interval]	
LogPSXI						
L1.	0.278699	0.109723	2.54	0.013	0.05969	0.4977069
L2.	0.342918	0.115849	2.96	0.004	0.11168	0.5741537
L3.	0.440885	0.104088	4.24	0	0.23313	0.6486443
L4.	-0.13642	0.095043	-1.44	0.156	-0.3261	0.0532869
IFR						
--.	-0.00299	0.003836	-0.78	0.438	-0.0107	0.0046617
L1.	-0.00231	0.004175	-0.55	0.583	-0.0106	0.0060283
L2.	-0.00133	0.004176	-0.32	0.75	-0.0097	0.0070013
L3.	0.006311	0.003691	1.71	0.092	-0.0011	0.0136775
EFR						
--.	-0.00229	0.002744	-0.83	0.407	-0.0078	0.0031879
L1.	0.007304	0.002744	2.66	0.01	0.00183	0.0127821
MMFR						
--.	0.006989	0.005998	1.17	0.248	-0.005	0.0189596
L1.	-0.01398	0.005896	-2.37	0.021	-0.0258	-0.0022145
L2.	0.002161	0.005917	0.37	0.716	-0.0097	0.0139715
L3.	-0.00073	0.006384	-0.11	0.909	-0.0135	0.0120142
FOFR						
--.	0.005358	0.010876	0.49	0.624	-0.0164	0.0270668
L1.	-0.00201	0.006806	-0.3	0.769	-0.0156	0.0115775
AAFR	0.002308	0.010295	0.22	0.823	-0.0182	0.0228563
SSCAVG	0.003083	0.002488	1.24	0.22	-0.0019	0.0080482
_cons	0.744432	0.53463	1.39	0.168	-0.3227	1.811559

Note: Number of obs= 86, Prob > F = 0.000, R-square=0.8552 Critical value 1%,5%,10%

$LogPSXI_t = \alpha + \beta_1 SMP_{t-1} + \beta_2 SMP_{t-2} + \beta_3 SMP_{t-3} + \beta_4 SMP_{t-4} + \beta_5 IFR_{t-0} + \beta_6 IFR_{t-1} + \beta_7 IFR_{t-}$

$+ \beta_8 IFR_{t3} + \beta_9 EFR_{t-0} + \beta_{10} EFR_{t-1} + \beta_{11} MMFR_{t-0} + \beta_{12} MMFR_{t-1} + \beta_{13} MMFR_{t-2} + \beta_{14} MMFR_{t-3} + \beta_{15} FOFR_{t-0} + \beta_{16} FOF_{t-1} + \beta_{17} AAFR_{t-0} + \beta_{18} SSCAVG_{t-0}$

1. In the above results shows the overall fitness of the model. F statistic is significant because p>F is less than the 0.05, 0.01 and 0.1 percent so the level is significant and model is fit.

2. R^2 co-efficient of determinant R^2=0.8552 which rage is 0 to 1 it means explanatory power of independent variable to bring change in dependent variable. Independent variables explain 86% change in dependent variable.

3. Effect of Independent variable on dependent variable L1 of PSXI, has positive effect on Log PSXI because its coefficient value is 0.2786. The result is significant at 5% significant level. Its means that current performance of PSXI is also influence by the previous one lag period. so L2 and L3 have positive coefficient same results but L4 show the negative sign it means it is insignificant at 5% has no influence by the previous four lag period.

Income fund return shows results the p value is greater than the 0.05,0.01 and 0.1 so it is insignificant on other hand L0, L1 and L2 period shows negative value means that there is negative relationship L3 having positive sign shows positive association between variables. Equity fund return shows results that p value is less than the 0.05, 0.01 and 0.1 so it is significant but at the L0 period negative coefficient means negative relationship and L1 show positive coefficient value means that it is positive association.

Money market fund return will show result the p value is greater than 5% and L0 and L2 period the value of coefficient is positive mean there is association and in significant but L1 and L3 shows negative coefficient and p value is greater than 5% it means it insignificant and negative association. Fund of fund return are insignificant because p value is greater than the 5% and lag period 0 have negative sign means negative association but at lag period of 1 it is positive means positive association. Asset allocation fund return and Sum of Shariah compliant average fund return shows result positive coefficient means positive association and its p value is greater than 5% means it is insignificant.

Table 7 ARDL Conventional & SSCAVG (long run)

D.LogPSXI	Coef.	Std. Err.	T	P>|t|	[95% Conf. Interval]	
ADJ							
LogPSXI							
L1.	-0.0739	0.05301	-1.39	0.168	-0.1797	0.0319
LR							
IFR	-0.0044	0.06498	-0.07	0.946	-0.1341	0.12531
EFR	0.06784	0.05308	1.28	0.206	-0.0381	0.17378

MMFR	-0.0753	0.13556	-0.56	0.581	-0.3458	0.19533
FOFR	0.04532	0.1932	0.23	0.815	-0.3403	0.43096
AAFR	0.03122	0.14046	0.22	0.825	-0.2491	0.31159
SSCAVG	0.04171	0.04804	0.87	0.388	-0.0542	0.1376

The above results show a positive coefficient value for both the Shariah compliant average and all conventional mutual fund performances. With the exception of IFR and MMFR, this indicates a positive association; however, the returns on money market and income funds are not, and all the p value is greater than the 5% will insignificant.

ARDL Bound Test

```
Pesaran/Shin/Smith (2001) ARDL Bounds Test
H0: no levels relationship              F =   4.840
                                        t =  -1.394

Critical Values (0.1-0.01), F-statistic, Case 3

        | [I_0]    [I_1] | [I_0]    [I_1] | [I_0]    [I_1] | [I_0]    [I_1]
        |   L_1      L_1 |   L_05     L_05 |   L_025   L_025 |   L_01     L_01
------+----------------+----------------+----------------+----------------
  k_6 |   2.12     3.23 |   2.45     3.61 |   2.75     3.99 |   3.15     4.43
accept if F < critical value for I(0) regressors
reject if F > critical value for I(1) regressors

Critical Values (0.1-0.01), t-statistic, Case 3

        | [I_0]    [I_1] | [I_0]    [I_1] | [I_0]    [I_1] | [I_0]    [I_1]
        |   L_1      L_1 |   L_05     L_05 |   L_025   L_025 |   L_01     L_01
------+----------------+----------------+----------------+----------------
  k_6 |  -2.57    -4.04 |  -2.86    -4.38 |  -3.13    -4.66 |  -3.43    -4.99
accept if t > critical value for I(0) regressors
reject if t < critical value for I(1) regressors
```
Table 8 ARDL Bound Test

The results show that there is long run relationship because F statistic is 4.840 which is greater than I(I) so it means we accept the alternative hypothesis and reject null hypothesis. If we compare the I(0) value with F statistic it is high and we

cannot accept the null hypothesis or reject the null hypothesis means that accept the alternative hypothesis at all the level 1%,2.5%,5% and 10%.

Conclusion

The primary goal of this research was to determine how Pakistan's stock exchange performance was affected by conventional and Shariah-compliant mutual funds. Secondary data from May 2013 to July 2020 was analyzed, and data from the official websites of PSX (100 Index) and MUFAP (Mutual Fund Association of Pakistan) was used to draw conclusions for this study.

The Pakistan Stock Exchange Index has a positive and significant lag period of 1, 2, and 3, according to the study's results. On the Pakistan Stock Exchange Index, income fund return has also been positive and considerable with a lag period of three. With a lag period of 1, the conventional equity fund's returns on the stock market index are also positive. The mean indicates noteworthy outcomes. With lag period 1, money market funds have a notable beneficial impact on the Pakistan Stock Exchange Index. Conversely, the average fund return that is compliant with Shariah, the Fund of Fund, the Assets Allocation Fund (Conventional), and the Pakistan Stock Exchange Index have all shown insignificant and negative returns.

During the examined period, which ran from May 2013 to July 2020, financial institutions may have invested less or nothing at all, contributing to this unfavorable behavior towards rate of return. Better returns on funds are provided in comparison to stock market returns, as evidenced by With the exception of Asset Allocation Fund returns, Fund of Fund returns, and Shariah compliance returns in the brief time frame, income fund returns, equity fund returns, and money market fund returns (conventional) have all exhibited noteworthy behavior.

The long-term data indicates that there is no substantial correlation between the returns of conventional and Shariah-compliant mutual funds. Our findings are in line with other research, yet the income fund and the Shariah-compliant income fund show discrepancies (Aziz, 2019). The findings of the ARDL bound test reveal the long-term link between the variables.

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