A Comparative Performance Evaluation of Islamic and Conventional Mutual Funds in Saudi Arabia

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Abstract

Purpose

The literature on the comparative performance of Islamic and conventional mutual funds provides conflicting results. Some studies find superior performance of Islamic mutual funds (IMF) to conventional mutual funds (CMF) whereas others conclude to the contrary. This study aims to contribute to the debate on the comparative performance of Islamic and conventional mutual funds in Saudi Arabia.

Design/methodology/approach

This study participates in the ongoing debate by analyzing the performance of IMF and CMF based on risk-adjusted returns measures such as the Sharpe ratio, Treynor ratio, and Jensen's Alpha. Furthermore, we examine the selectivity and the market timing skills of IMF and CMF using Treynor and Mazuy model. Five-year monthly data from 2013 to 2017 for forty mutual funds located in Saudi Arabia are used for analysis.

Findings

We find that IMF and CMF have almost similar performance on the basis of Treynor ratio and Jensen's Alpha. However, results from the Sharpe ratio indicate that Islamic funds perform better than their conventional counterpart. The study also finds that the selectivity and the market timing abilities of both Islamic and conventional mutual funds outperform the market portfolio. Superior selectivity skills of IMF to the CMF and similar timing ability of both types of fund managers is also observed.

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Practical implications

Islamic mutual funds are less risky than conventional mutual funds and they provide better hedging prospects for stockholders in general

Originality/value

This study aims to contribute to the debate on the comparative performance of Islamic and conventional mutual funds using the latest data and applying the equality of means and the Random effect model, which no other study has used in the context of Saudi Arabia.

Keywords

Islamic Mutual Funds, Performance Evaluation, Saudi Mutual Funds, Risk Adjusted Measures, Selectivity and Market Timing Abilities, Random Effect Model.

1. Introduction

Mutual fund is an investment vehicle that offers investors the opportunity to pool their funds for investing in stocks, bonds, money market instruments and other securities. A mutual fund is managed by a professional manager and provides high level of diversification across many securities, which an individual investor finds costly by direct purchase. Moreover, the minimum initial investment requirement for most mutual funds is very affordable.

The performance of mutual funds has long been the topic of discussion. Many studies have been conducted to evaluate their performance against the overall market performance. Moreover, the comparisons have also been made between the performance of Islamic mutual funds (IMF) and the conventional mutual funds (CMF).

During the past two decades, Islamic mutual funds and their net asset values have experienced a robust growth. This growth has driven several empirical studies on the evaluation of performance and riskiness of Islamic mutual funds, such as Abdullah et al. (2007), Merdad et al. (2010), and many others. The results are mixed. Few researchers find that IMF outperform CMF (Ashraf, 2013), while other conclude that there are no major differences in their yields (Elfakhani and Hassan, 2007). Some studies however find that the CMF have superior performance to IMF (Agussalim, et al., 2017).

In the Middle East region, Saudi Arabia was the first market to invest in the mutual fund industry with National Commercial Bank establishing and managing the first fund in 1979. The success of this experiment drew more Saudi banks to develop a variety of mutual funds. Although the industry has grown phenomenally since then, few studies have been conducted to evaluate, analyze, and compare the performance of Saudi mutual funds. A recent study by Naseem and

Ishaq (2017) for Saudi Arabia though compares the performance of locally focused equity mutual funds with their benchmark, it does not distinguish between CMF and IMF. The other studies on the subject includes Ashraf (2013) who finds that IMF outperform CMF during the market downward, while Merdad et al. (2013) suggest there is no difference between the Islamic and CMF performance. El-Masry and Mosallamy (2016) conclude that IMF outperform CMF and the market portfolio. These findings indicate that the debate of which mutual fund has superior performance is far from settled.

This study aims to contribute to the debate on the comparative performance of IMF and CMF. We analyze the financial performance of Saudi Mutual Funds using risk-adjusted returns measures such as the Sharpe ratio, Treynor ratio, and Jensen's Alpha. We then use the tests for equality of means to examine whether there is significant difference between the performance of these mutual funds on the basis of above measures. In addition, we assess how good mutual fund managers are in selecting the stocks for their portfolio termed as the 'selectivity skills'. Moreover, we evaluate how well these managers anticipate changes in the market prices and react accordingly by estimating their 'timing abilities'. The last two measures of performance are obtained by estimating the Treynor–Mazuy's (1966) model using random effect method.

The study is divided into five sections. Following the introductory section, the literature review is presented in section 2, while section 3 explains the data and methodology used. Results and findings are discussed in section 4. Finally, the conclusion is presented in section 5.

2. Literature Review

There have been many studies that analyse the performance of mutual funds in various countries. The performance of these funds is usually compared either to market benchmarks or to

comparable mutual funds. The results of these studies are mixed. Some find that mutual funds yield better returns than their benchmarks, usually the market index, while others show that these funds perform significantly lower than their benchmarks.

Li and Lin (2011) analyze the performance of mutual funds using the data of 159 Chinese equity funds from 2003 to 2008 and applying the Sharp ratio, Jensen's Alpha, and Fama & French three factors model. They find that the Chinese funds outperform stock market benchmark based on the Sharpe ratio values. Moreover, these fund managers were successful in obtaining the positive alphas on their investment portfolios, which indicates their superior stock selection ability. On the other hand, Christensen (2013) employed Treynor and Mazuy model to 47 Danish mutual funds' data that splits between 34 equity funds and 13 fixed income funds over the period from January 1996 to June 2003 and concluded that, in general, mutual funds provide lower returns than market returns. Furthermore, fund managers were found to have negative alphas or inferior stock selection ability and no timing ability. Since this study focuses on the comparative performance of CMF and IMF, we restrict our discussion to the literature that are relevant to this comparison.

Abdullah et al. (2007) analyzed 65 Malaysian mutual funds of which 14 were Islamic and 51 were conventional. Using the Sharpe ratio, Treynor ratio, and adjusted Jensen alpha, authors conclude that both Islamic and conventional funds underperform the benchmark. Moreover, conventional funds perform better than the Islamic funds during bullish trends, while IMF performance was better during bearish trends. They also find that the conventional funds have diversification levels that are slightly better than Islamic funds.

Abderrezak (2008) employed the Sharpe ratio, the capital asset pricing model (CAPM), the Jensen's Alpha, and the three-factor model to evaluate the performance of 46 IMF for the period

from 1997 to 2002 and concluded that the IMF, on average, not only underperformed against their benchmarks but poor security selection ability was also observed.

Merdad et al. (2010) evaluate 28 Saudi mutual funds managed by one fund manager using the Sharpe ratio, the Treynor ratio, the Jensen alpha, and the Treynor and Mazuy model. They find that the Islamic funds underperform conventional funds during both the full and the bullish periods but outperform during the bearish and the financial crisis periods. Furthermore, they conclude that the Islamic fund managers are good at showing the timing and the selectivity skills during the bearish period, and their counterpart exhibit these skills better during the bullish period.

Hayat and Kraeussl (2011) evaluate 145 Islamic equity funds over the period from 2000 to 2009 and found that the IMF underperform Islamic as well as conventional equity benchmarks. This underperformance increases during the financial crisis. They also find that the Islamic equity funds managers have bad timing skills.

Employing the CAPM and the Carhart model, Hoepner et al. (2011) examined the performance of 265 Islamic equity funds from 20 countries and concluded that funds from eight nations significantly underperform their respective benchmarks, while funds from only three nations outperform their benchmarks. In addition, they found that Islamic funds from the GCC do not significantly underperform their benchmark.

Ashraf (2013) evaluates 159 Saudi mutual funds using the CAPM and the Treynor & Mazuy models from 2007 to 2011 and concluded that the IMF, on average, perform better than the CMF during economic crisis. Furthermore, the results on stock selection ability indicate that the Islamic mutual fund managers possess superior stock selection ability to the conventional mutual fund managers.

El-Masry et al. (2016) analyzed the 21 Saudi mutual funds over the period from 2005 to 2011 using CAPM, downside CAPM and Fama & French 3-factor model and concluded that, on average, IMF outperform CMF and the market portfolio.

Agussalim et al. (2017) studied four CMF and five IMF from 2007 to 2014 and establish that on the basis of level of returns, CMF perform better than IMF, while IMF outperform CMF when level of risk is compared.

Boo et al. (2017) examined 448 Malaysian funds of which 131 were Islamic over the period from 1996 to 2013. Their results show there is no clear-cut superior performance of Islamic mutual funds to their conventional peers. However, Islamic funds significantly outperformed CMF during the recent financial crises. The study further indicates that Islamic mutual funds have better risk management compared to conventional peers.

Al Rahahleh et al. (2017) analyzed 25 IMF and 14 CMF in Saudi Arabia from 2007 to 2016. They conclude that, on the basis of non-risk adjusted returns, Islamic funds produced a significantly higher returns than their benchmark during 2014 and significantly lower returns than their benchmark during 2016. However, based on the risk-adjusted measures, IMF slightly underperformed their benchmark. There are many other studies on the topic which are summarized in a table presented in the appendix for brevity.

In summary, Abderrezak (2008), Abdullah et al. (2007), and Hayat and Kraeussl (2011) find that the Islamic mutual funds underperform their benchmark and managers have poor timing and selectivity skills, whereas Hoepner et al. (2009), Agusssalim et al. (2017) and Boo et al. (2017) establish that no clear-cut superior performance of IMF to CMF is found.

The results from the studies on Saudi mutual funds vary. For instance, Merdad et al. (2010), Ashraf (2013), El-Masry et al. (2016), and Al Rahahleh et al. (2017) find that IMF outperform

CMF during the bearish periods with better timing and selectivity skills, while Merdad et al. (2013) conclude that there is no statistical difference between the performance of these funds. This indicates that there is no clear superior performance of one category to the other. In this scenario, our study is an attempt to contribute to the debate on the comparative performance of IMF and CMF. We assess and analyze the financial performance of Saudi mutual funds using risk-adjusted returns measures such as the Sharpe ratio, Treynor ratio, Jensen's Alpha and Treynor–Mazuy's (1966) model. In addition, we assess how good mutual fund managers are in selecting the stocks for their portfolio (selectivity skills), and how well they are in anticipating the changes in market prices and responding accordingly (timing abilities).

3. Data and Methodology

3.1 Data Selection

To examine the performance of Saudi Mutual funds, we selected a sample of forty mutual funds listed on Tadawul All Saudi Index (TASI), twenty funds are Islamic and the remaining twenty are conventional mutual funds. The selection criteria of mutual funds include being open-ended, managed in Saudi Arabia, invest in local currency, use local financial instruments and active over the past five years, from January 2013 to December 2017. These criteria ensure reliable and consistent data when TASI is used as a benchmark for both IMF and CMF evaluation.

We use Tadawul All Saudi Index (TASI) as a proxy for market portfolio and Saudi Arabia Inter-Bank Offered Rate (SAIBOR) as a proxy for the risk-free rate.

All the data were downloaded from the Bloomberg including TASI monthly returns, SAIBOR 3-months rate, mutual funds monthly returns and the beta of each fund over the study period.

3.2 Methodology

This study attempts to evaluate and compare the performance of Islamic and conventional mutual funds in Saudi Arabia using risk-adjusted returns, managers' selectivity skills and their timing abilities. Fund managers' selectivity skills are defined as how good managers are in selecting the stocks for their portfolio, whereas managers timing abilities indicate how good they are in anticipating changes in the market prices.

The risk-adjusted return measures are estimated using the Sharpe ratio, Treynor's ratio, and Jensen's Alpha ratio, which have been the standard for measuring the performance of funds in previous literature as well as in practice in the financial institutions. In addition, we examine the managers' market timing ability and selection ability by applying Treynor and Mazuy's model which is explained in the coming section.

3.2.1 Risk-Adjusted Return Measures

The three standard risk-adjusted return measures, i.e., the Sharpe ratio, the Treynor ratio, and the Jensen's alpha are given below.

Sharpe ratio:

Sharpe (1966) derived an absolute risk-adjusted return measure, called the Sharpe ratio, where no market benchmark is required for its calculation. This ratio shows the average excess returns of a fund over the average risk-free rate per unit of a standard deviation of the mutual fund. The Sharpe ratio indicates how well a fund investment is performing compared to a risk-free investment. A higher ratio indicates a better diversification ability of fund manager to diversify relative to the overall risk. A negative Sharpe ratio indicates that the investor would have a better risk-adjusted rate of return using a risk-free investment.

$$SR = \frac{R_i - R_f}{\sigma_i} \qquad (1)$$

Where R_i represents returns of a fund, $(R_i - R_f)$ is the average excess return of a fund over the average risk-free rate (R_f) and σ_i is the total volatility (risk) of the fund.

Treynor ratio:

The Treynor ratio is a reward to volatility measure and requires market benchmark for its calculation contrast to Sharpe ratio where this benchmark is not needed. The ratio measures the average excess returns of a fund over the average risk-free rate per unit of systematic risk. The systematic risk is measured by the portfolio's beta instead its standard deviation. The Treynor ratio offers an improved performance measure compared to Sharpe ratio, as the diversification of risk is possible by pooling funds in a larger portfolio. The ratio is calculated as,

$$TR = \frac{R_i - R_f}{\beta_i} \qquad\qquad (2)$$

Where $R_i - R_f$ is the average excess return and β_i represents fund's beta. The value of this beta can be estimated using an appropriate CAPM model. A higher ratio indicates better diversification ability of a fund manager relative to the systematic risk and vice versa.

Jensen's Alpha:

Jensen's alpha, introduced by Micheal Jensen in 1970, determines the excess returns of a portfolio over risk adjusted returns projected by capital asset pricing model. The value of alpha is obtained by estimating the following type of capital asset pricing model.

$$R_{it} - R_{ft} = \alpha_i + \beta_i \left(R_{mt} - R_{ft}\right) + \varepsilon_{it} \qquad\qquad (3)$$

The intercept α_i gives the Jensen's alpha, β_i represent the systematic risk for the fund i, and $(R_{mt} - R_{ft})$ is the market excess return. A positive value of α_i displays superior stock selection ability of a fund manager.

The above three ratios for Islamic and conventional mutual funds will be compared to find out the difference in performance. The tests for equality of means will be used to analyze these results.

3.2.2 The Treynor and Mazuy model

The second approach to evaluate the performance of mutual funds is to examine the managers' market timing ability and stock selection ability by applying the widely used model introduced by Treynor and Mazuy in 1966.

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \gamma_i(R_{mt} - R_{ft})^2 + \varepsilon_{it} \quad (4)$$

The right-hand side of this model is composed of the market's excess returns ($R_{mt} - R_{ft}$) and the market's quadratic excess returns ($R_m - R_f$)^2. The left-hand side is the excess returns of the mutual fund ($R_{it} - R_f$). The intercept term α_i refers to the stock selection ability of fund managers, whereas β_i indicates the systematic risk associated to the mutual funds. The γ_i is the market timing ability of manager to adjust assets in the portfolio by anticipating changes in the market prices.

A statistically significant positive value of α_i indicates that the fund managers have superior stock selection skills, as it quantifies the returns that are achieved over the excess returns explained by market movements. A statistically significant positive value of γ_i indicates that the mutual fund managers possess good market timing skills. This parameter reflects the convexity of the portfolio return function (characteristic line) which implies that the managers increase their market exposure as the market goes up. A significant negative value of γ_i reflects that managers' attempts to outperform the market affect their returns negatively. Furthermore, an insignificant or zero value of γ_i represents a lack of the timing ability.

4. Empirical Results

We analyze the performance of forty mutual funds listed in TASI by estimating the risk-adjusted return measures and the Treynor and Mazuy model. Before estimation it is imperative to perform data diagnostics

4.1 Data Diagnostics

4.1.1 Descriptive Statistics

We present the descriptive statistics on the variables of Treynor and Mazuy model, and on the risk-adjusted measures of both IMF and CMF.

Table 1 shows the descriptive statistics on the risk-adjusted return measures. Looking at the main characteristics of the data, statistics indicate that IMF have slightly lower average returns (0.45) than CMF (0.49). On the other hand, returns of CMF have higher standard deviation (4.998) than IMF (4.304) indicating a higher volatility. The IMF show a better Sharpe ratio (0.08) than CMF (-0.035). Moreover, higher selectivity skills of IMF managers (0.38) than of their conventional peers (0.07) is also found.

Furthermore, the maximum returns of IMF and CMF, on average, are same except for the Jensen's alpha where CMF have higher value (23.79) than IMF (4.92). The comparison of minimum returns shows that all the measures of CMF have lower values than IMF.

Table 1: Descriptive Statistics for the Risk-Adjusted measures

	IR_i	R_i	ISR	SR	ITR	TR	IALPHA	ALPHA
Mean	0.450	0.490	0.078	-0.035	0.563	0.576	0.376	0.071
Median	0.165	0.169	0.108	0.095	0.059	0.090	-0.017	-0.106
Maximum	18.126	19.913	3.120	3.554	45.947	39.441	4.923	23.797
Minimum	-18.614	-22.672	-3.551	-5.034	-49.135	-68.514	-3.051	-23.521
Std. Dev.	4.304	4.998	0.943	1.132	6.885	8.792	1.483	3.361
Skewness	-0.390	-0.320	-0.576	-0.790	-0.246	-0.930	0.493	-0.279
Kurtosis	6.305	5.827	4.797	5.179	11.258	13.913	3.436	11.831

Jarque-Bera	576.548	420.146	227.947	362.400	3421.837	6127.292	58.246	3914.806
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum	539.600	588.251	93.459	-41.563	675.625	691.745	451.057	85.418
Sum Sq. Dev.	22209.84	29954.75	1066.54	1536.77	56831.88	92687.90	2637.63	13547.01
Observations	1200	1200	1200	1200	1200	1200	1200	1200

Notes: This table presents the descriptive statistics of the risk-adjusted measures; Sharpe ratio (SR), Treynor ratio (TR), and Jensen's Alpha (ALPHA), where I refers to the Islamic mutual fund ratio

Table 2 shows the descriptive statistics on the variables used in Treynor and Mazuy model. The statistics indicate that the excess returns (R_i -R_f,) of IMF (0.33) are slightly lower than of CMF (0.38). On the other hand, the standard deviation of excess returns of CMF (5.00) is higher than of IMF (4.30), which is consistent with the notion, "higher the return, higher the risk". The maximum returns of both IMF (18.06) and CMF (19.83) are almost similar, whereas the minimum values of excess returns of IMF (-18.69) is lower than of CMF (-22.82).

Table 2: Descriptive Statistics for Treynor and Mazuy variables

	Islamic (R_i-R_f)	Conv. (R_i-R_f)	(Rm-R_f)	(Rm-R_f)^2
Mean	0.338	0.379	0.445	34.827
Median	0.020	0.033	0.963	9.377
Maximum	18.061	19.834	16.312	291.753
Minimum	-18.686	-22.815	-17.081	0.044
Std. Dev.	4.305	4.999	5.887	62.107
Skewness	-0.387	-0.319	-0.313	2.708
Kurtosis	6.284	5.812	4.286	9.868
Jarque-Bera	569.201	415.779	102.246	3824.633
Probability	0.000	0.000	0.000	0.000
Sum	405.576	454.227	534.196	41791.98
Sum Sq. Dev.	22217.16	29962.77	41554.18	4624814.
Observations	1200	1200	1200	1200

Notes: This table presents the descriptive statistics of Treynor-Mazuy model; funds' excess returns (R_i-R_f), market excess returns (Rm-R_f) and quadratic fund excess returns (Rm-R_f)^2.

Table 3 and 4 presents pairwise correlation coefficients between the variables involved in Treynor and Mazuy model, which though shows a healthy correlation between the variable, rules out the possibility of perfect multicolinearity.

Table 3: Correlation matrix for Treynor and Mazuy IMF Variables

	$(R_i\text{-}Rm)^2$	$(R_i\text{-}R_f)$	$(Rm\text{-}R_f)$
$(Rm\text{-}R_f)^2$	1.0000		
$(R_i\text{-}R_f)$	-0.1478	1.0000	
$(Rm\text{-}R_f)$	-0.0901	0.7099	1.0000

Table 4: Correlation for Treynor and Mazuy CMF Variables

	$(R_i\text{-}Rm)^2$	$(R_i\text{-}R_f)$	$(Rm\text{-}R_f)$
$(Rm\text{-}R_f)^2$	1.0000		
$(R_i\text{-}R_f)$	-0.1264	1.0000	
$(Rm\text{-}R_f)$	-0.0902	0.7409	1.0000

4.1.2 Unit Root Test

Since the mean and variance of time series data are likely to vary over time, we need to perform stationarity tests to avoid the problem of spurious regression. Since ours is panel data, we need to conduct panel unit root tests where the asymptotic behavior of the time-series dimension and the cross-sectional dimension are taken into consideration (Hlouskova and Wagner, 2006). We applied Levin, Lei & Chu (LLC), Im, Persaran & Shin (IPS), and Fisher tests to detect the stationarity of the variables involved. The null hypothesis for these tests is defined as the presence of a unit root (non-stationary) in the series against the alternative that it is stationary. Table 5 shows that the null hypothesis for all the variables included in Treynor and Mazuy model is rejected with a p-value less than 5% and therefore, all the variables involved are stationary at level.

Table 5: Panel Unit Root Tests

Excess Returns of Islamic Mutual Funds: $(R_i\text{-}R_f)$

Name of Test	Statistics	Prob.**	Cross Sections	Obs
Levin, Lin & Chu t	-14.9011	0.0000	20	1160
Im, Pesaran and Shin W-stat	-15.7916	0.0000	20	1160
ADF - Fisher Chi-square	327.324	0.0000	20	1160
PP - Fisher Chi-square	576.188	0.0000	20	1180
Excess Returns of Conventional Mutual Funds: (R_i-R_f)				
Levin, Lin & Chu t	-12.1105	0.0000	20	1160
Im, Pesaran and Shin W-stat	-16.6417	0.0000	20	1160
ADF - Fisher Chi-square	352.919	0.0000	20	1160
PP - Fisher Chi-square	582.885	0.0000	20	1180
Market Excess Returns: (R_m-R_f)				
Levin, Lin & Chu t	-23.1998	0.0000	20	1160
Im, Pesaran and Shin W-stat	390.846	0.0000	20	1160
ADF - Fisher Chi-square	352.919	0.0000	20	1160
PP - Fisher Chi-square	596.621	0.0000	20	1180
Quadratic Excess Returns: (R_m-R_f)^2				
Levin, Lin & Chu t	-21.4127	0.0000	20	1160
Im, Pesaran and Shin W-stat	-20.9821	0.0000	20	1160
ADF - Fisher Chi-square	453.536	0.0000	20	1160
PP - Fisher Chi-square	788.357	0.0000	20	1180

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

4.2 Tests for equality of means for the Risk-Adjusted Measures

We use the test for equality of means to examine whether mean differences between the risk-adjusted returns of IMF and CMF are statistically significant during the period of analysis. As displayed in table 6, the Treynor ratio and the Jensen's Alpha show insignificant mean difference of returns between IMF and CMF. In other words, there is no difference between Islamic and conventional mutual funds' average excess returns per unit of systematic risk. Moreover, selectivity skills of conventional and Islamic fund managers are similar throughout the period of analysis. That is, mutual funds in Saudi Arabia, whether they are Islamic or conventional, are alike in terms of systematic risk diversification as well as the stock selection capability.

The Sharpe ratio shows that there is a clear superior performance of IMF to CMF, as indicated by the significant mean difference between the Islamic and conventional funds in the year 2017

and during the overall 5-year period. This illustrates that the IMF were able to manage unsystematic risk better than the CMF.

During the period from 2013 to 2015 there is no difference between average returns of IMF and CMF as reflected by the Sharpe ratio and the Treynor ratio. It should be noted that in 2015 there was a major drop in oil prices, and as the market started its recovery in 2016, difference of returns between IMF and CMF started to appear as indicated by low p-values in 2016 (0.11) and 2017 (0.082).

In conclusion, the Treynor ratio and the Jensen's Alpha indicates that the performance of IMF is not different from that of CMF, whereas the Sharpe ratio shows a significantly superior performance of IMF to CMF. This implies that managers of IMF are able to manage their unsystematic risk better, and therefore, their overall risk management is healthier than that of CMF.

	2013		2014		2015		2016		2017		Over 5-yrs	
	IMF	CMF	IMF	CMF	IMF	CMF	IMF	CMF	IMF	CMF	IMF	CMF
Sharpe ratio Mean	0.34	0.244	0.094	0.034	-0.143	-0.262	0.041	-0.157	0.074	-0.032	0.078	-0.035
t-test	1.749		1.584		1.134		1.584		*1.748		***2.645	
p-value	0.1467		0.5395		0.2574		0.1138		0.081		0.0082	
Treynor ratio Mean	2.297	2.588	0.797	1.045	-0.832	-1.406	0.032	0.254	0.635	0.401	0.563	0.576
t-test	0.639		-0.24		0.677		-0.316		-0.601		-0.042	
p-value	0.5482		0.752		0.4986		0.8101		0.5234		0.9668	
Jensen's Alpha												

Table 6: Tests for equality of means

Mean	0.115	0.15	0.389	0.575	0.104	-0.081	-0.426	-0.344	0.224	0.056	0.06	0.071
t-test	0.734		-0.243		0.586		-0.65		-0.166		-0.087	
p-value	0.8681		0.5158		0.5578		0.8082		0.4631		0.9303	

Notes: This table presents the risk-adjusted measures for the period from January 2013 to December 2017. The Sharpe ratio, Treynor ratio and Jensen alpha (α) are obtained through Formulas (1), (2) and (3). The values reported in the table are based on monthly returns. The beta values used in the Treynor ratio and Jensen's alpha are downloaded from Bloomberg. The results on the basis of Satterthwaite-Welch t-test and Welch F-test, which allow for unequal variances, also showed the identical result to the t-test reported above.

The asterisks are used to denote the statistical significance

*Statistically-significant values at 10% level.

** Statistically-significant values at 5% level.

*** Statistically-significant values at 1% level

4.3 The Treynor and Mazuy (1966) Model

We analyze the timing and selectivity skills of mutual funds managers by estimating the Treynor and Mazuy model, which is rewritten below

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \gamma_i(R_{mt} - R_{ft})^2 + \varepsilon_{it} \qquad (4)$$

A positive and significant value of α indicates that fund managers have superior stock selection abilities that beats the market portfolio. The beta (β) measures market risk, which is also defined as the sensitivity of returns of a portfolio with market returns. A significant positive value of γ shows that fund manager holds skills for correctly capturing the market changes.

The equation 4 can be estimated using either by pooled ordinary least squares (OLS) or Fixed Effect/Random Effect model. Since OLS does not distinguish between period and cross-section and ignores all individual specific effects completely, we employ a Random Effect (RE) model. The selection of RE model over fixed effect model is carried out by performing the Hausman specification test, which follows chi-squared distribution. The null hypothesis that preferred model is RE against the alternative that Fixed Eeffect model is appropriate cannot be rejected for both IMF and CMF as indicated by closer to unity p-values.

We run the regression using Panel EGLS (Estimated Generalized Least Square) (Cross-section random effects) method with white period coefficient covariance[3]. The results are

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[3] To detect the homogeneity of residuals in estimating Treynor and Mazuy model, we run panel cross-section heteroscedasticity LR test. The null hypothesis that residuals are homoscedastic can easily be rejected at well below five percent level of significance for both IMF and CMF version of the model, as indicated by the values of Likelihood ratio for IMF (285.3776) and CMF (365.1132).

reported in table 7 and 8. The positive and significant values of alpha (α) coefficients for both CMF and IMF, denoted by the C, indicate that mutual funds in Saudi Arabia significantly outperform the market portfolio. Furthermore, the selectivity skills (α) of IMF managers are slightly higher (0.31) than of CMF managers (0.27). This superiority might be attributed to the screening process applied to the Islamic funds. The values of coefficients on timing abilities of conventional as well as Islamic mutual fund managers are almost zero, -0.005 and -0.006 respectively, which implies that managers are not able to anticipate changes in the market. Alternatively, mutual funds managers in Saudi Arabia are not capable of correctly capturing the expected market changes and cannot benefit from these changes. Moreover, the systematic risk (β) is positive and statistically significant for IMF (0.51) and CMF (0.62). The slightly low value of β for IMF relative to CMF indicates that IMF have lower volatility in returns than their conventional counterparts, and are typically less risky than conventional funds. Therefore, managers of IMF have better assessment and management of risk than of CMF.

Table 7: The Random Effect Model for IMF

Dependent variable ($R_i\_R_f$), Adjusted R^2 =0.510

Variable	Coefficient	Std. Error	t-Statistic	Prob
$(R_m\_R_f)$	0.514	0.079	6.500	0.000
$(R_m\_R_f)^2$	-0.006	0.001	-4.752	0.000
C	0.313	0.080	3.931	0.000

Table 8: The Random Effect Model for CMF

Dependent variable ($R_i\_R_f$), Adjusted R^2 =0.552

Variable	Coefficient	Std. Error	t-Statistic	Prob
$(R_m\_R_f)$	0.625	0.080	7.782	0.000
$(R_m\_R_f)^2$	-0.004	0.001	-3.605	0.000
C	0.270	0.080	3.347	0.000

From above discussion we can conclude that mutual funds in Saudi Arabia significantly outperform the market portfolio. Moreover, managers of IMF have better stocks selection ability than CMF, whereas in terms of timing ability, both types of managers are unable to anticipate changes in the market.

5. Summary and Conclusion

This study aims to evaluate the performance of mutual funds using risk-adjusted returns measures such as the Sharp ratio, the Treynor ratio, and the Jensen's Alpha. Treynor–Mazuy's model is also employed to assess how good managers are in stocks selection for their portfolio, the selectivity skills, and how well these managers anticipate changes in market prices, the timing abilities.

The Sharpe ratio shows that IMF managed the overall risk better than CMF, which indicates that IMF have better management for the unsystematic risks. The results from the Treynor ratio and the Jensen's alpha revealed that there is an insignificant difference between the performance of IMF and CMF implying that both perform essentially the same.

Moreover, the study finds that both types of mutual funds in Saudi Arabia significantly outperform the market portfolio. The results from stock selection ability indicate that IMF managers hold a slightly better selectivity skill than CMF managers, which may be attributed to the screening process applied to the Islamic funds. In terms of market timing ability, the study finds that IMF and CMF managers have negative coefficients with almost zero values that conclude neither of them exhibit any market timing ability. Therefore, fund managers in Saudi Arabia are not capable of correctly anticipating price changes in the market. However, a significant and lower beta of Islamic funds compared to conventional funds indicates that Islamic mutual funds are less risky than conventional mutual funds and they provide better hedging prospects for stockholders in general.

Our results on the basis of Treynor ratios and Jensen's Alpha support the findings of Elfakhani and Hassan (2007) and Abdulrrezak (2008) where IMF and CMF do not differ substantially in their performance. Furthermore, our results from Sharpe ratio are in agreement with Merdad et al. (2013) and Boo et al. (2017) findings that IMF have better risk management compared to CMF, and therefore IMF are less risky than their conventional counterpart.

Linking our results from Treynor and Mazuy estimation with Ashraf (2013) and Merdad et al. (2010), we provide compatible conclusion that shows Islamic fund managers have better selectivity skills than conventional fund managers. Moreover, our findings that both IMF and CMF managers are unable to anticipate any changes in the market movement are contradictory to Merdad et al. (2010) results.

Though this study updates the literature on the performance of Islamic and conventional mutual funds and contributes new empirical results to the debate, it does not differentiate the performance of funds according to their size which other studies have found to be an important factor. In addition, the effect of market volatility is not really taken into the account while analyzing the performance of the mutual funds. Future research not limited to the above considerations would be interesting.

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Appendix 1: Summary of various studies on the performance of mutual funds

Type	Author/Year/Journal	Title of the Article	Sample Size	Location	Measures Used	Findings
CONV	Christensen (2013) Applied Economics Letters	Danish mutual fund performance	A sample of 47 mutual funds split between 34 equity funds and 13 fixed income funds, over the period January 1996 to June 2003.	Denmark	CAPM, Treynor and Mazuy, the Henriksson and Merton models, and multi-factor models	In general, mutual funds' performance is lower returns than market returns. Fund managers have negative alphas and have no timing ability.
CONV	Otten and Bams (2002) European Financial Management	European mutual fund performance	A sample of 506 funds from the five most important mutual fund countries from January 1991 to December 1998	Europe	Carhart (1997) 4-factor asset-pricing model, CAPM	Overall, European mutual funds, especially the small funds' cap, are able to add value. If management fees are added back, significantly outperformance is shown for four out of five countries.
CONV	Buchanan et al. (2011) Emerging Markets Review	Emerging market benefits, investability and the rule of law				Emerging markets represent the performance benefits by providing not only return enhancement but primarily risk-reduction. More specifically, the study finds that investors can achieve higher benefits from a limited set of emerging markets with a French civil law foundation and that are moderately investable stocks
CONV	Li and Lin (2011) Financial Services Review	Understanding emerging market equity mutual funds: the case of China	A sample of 159 equity funds that cover the period from 2003 to 2008	China	Sharpe ratio, Jensen's Alpha and three factors model	Chinese funds outperform the stock market benchmark significantly with their Sharpe ratio values. Chinese fund managers are successful in obtaining positive alphas on their investment portfolios.

Type	Author/Year/Journal	Title of the Article	Sample Size	Location	Measures Used	Findings
CONV	Białkowski and Otten (2011) The North American Journal of Economics and Finance	Emerging market mutual fund performance: evidence for Poland	A sample of 140 open-ended mutual funds, of which 100 invest domestically and 40 invest internationally for the period from 01/2000 till 01/2008	Poland	4-factor Carhart model to equity and mixed funds, and 1-factor bond model to bond funds.	Mutual funds on average are not able to add value, as indicated by their negative net alphas. Domestic funds outperform internationally investing funds, which points to informational advantages of local over foreign investors and "winning" funds are able to significantly beat the market, based on their significant positive alpha's.
IS	Elfakhani & Hassan (2007) Economic research forum. 12th Annual Conference, Cairo, Egypt	Performance of Islamic mutual funds	A sample of 46 Islamic funds for the period 1997 to 2002	Multiple locations	Sharpe, Treynor, Jensen, and Fama	The behavior of Islamic mutual funds does not differ substantially from that of the other conventional funds
IS	Abderrezak, Farid. 2008	The Performance of Islamic Equity Funds: A Comparison to Conventional, Islamic and Ethical Benchmarks	A sample of 46 Islamic equity funds (IEFs) relative to conventional funds, ethical funds, and Islamic and conventional market indices during the period from January 1997 to August 2002	Multiple locations	Sharpe ratio, the single-factor model(CAPM), Jensen Alpha, and the Fama and French 3-factor model	IMF, on average, performed poorly against their benchmarks during the sample period. The study also reports evidence of poor security selection and significant presence of small-cap bias with no significant performance differences between Islamic and conventional funds
IS	Abdullah, Hassan, and Mohamad (2007) Managerial Finance	Investigation of Performance of Malaysian Islamic Unit Trust Funds	a sample of 14 Islamic funds and 51 conventional funds in Malaysia during the period from 1992 to 2001	Malaysia	Sharpe ratio, Treynor ratio, adjusted Jensen alpha, Modigliani and Modigliani (MM) measure, and the information ratio.	CMF perform better than IMF during bullish trends; but during bearish periods, IMF perform better. They conclude that IMF offer hedging opportunities against downward market perids. They also find that CMF have diversification levels that are slightly better than IMF, but both funds are unable to beat the market diversification level.

Type	Author/Year/Journal	Title of the Article	Sample Size	Location	Measures Used	Findings
IS	Hayat and Kraeussl (2011), Emerging Markets Review	Risk and return characteristics of Islamic equity funds	a sample of 145 IEFs over the period 2000 to 2009	Malaysia	Jensen's alpha, Treynor and Mazuy model.	Islamic equity funds are underperformer compared to Islamic as well as to conventional equity benchmarks. This underperformance increased during the financial crisis. They also find that Islamic equity fund managers are bad market timers.
IS	Hoepner, Rammal, and Rezec (2009) Social Science Research Network	Islamic Mutual Funds' Financial Performance and International Investment Style: Evidence from 20 Countries	a sample of 265 Islamic equity funds from 20 countries	20 Country	CAPM, Carhart, conditional and unconditional three level Carhart model	Islamic funds from eight nations significantly underperform their respective equity market benchmarks. Funds from only three nations outperform their respective market benchmarks, and that Islamic funds are biased toward small stocks. Furthermore, they find that Islamic funds from the Gulf Cooperation Council (GCC) and Malaysia do not significantly underperform their respective market benchmarks nor are they biased toward small stocks.
IS	Razzaq, Nasir and Gul, Sajid and Sajid, Muhammad and Mughal, Sumra and Bukhari, Syeda Asma, (2012)-Economics and Finance Review, Vol 2(3), 16-25	performance evaluation of Islamic mutual funds in Pakistan	A sample of 9 mutual funds for the period from 2009 to 2010	Pakistan	Sharpe, Trenor, Jensen alpha and information ratio	Results show that Islamic funds have significant growth in previous years which indicate that in Pakistan Islamic funds are growing and these funds attract investor.

Type	Author/Year/Journal	Title of the Article	Sample Size	Location	Measures Used	Findings
IS	Agussalim, M., Limakrisna, N., & Ali, H. (2017)- International Journal of Economics and Financial Issues, 7(4).	Mutual Funds Performance: Conventional and Sharia Product	A sample of 4 conventional equity fund and 5 sharia equity fund. The period of the study conducted from 2007 to 2014.	Indonesia	Sharpe, Treynor, Jensen alpha	The results show the performance of conventional mutual funds perform better than Sharia mutual funds on the basis of the returns and the Sharpe index. However, on the basis of level of risk, Treynor index and Jensen's Alpha results indicate the performance of conventional mutual funds is lower than the Sharia mutual fund.
IS	Boo, Y. L., Ee, M. S., Li, B., & Rashid, M. (2017). Pacific-Basin Finance Journal, 42, 183-192.	Islamic or conventional mutual funds: Who has the upper hand? Evidence from Malaysia	The study period is from 1996 to 2013 number of mutual funds with 448, of which 131 were Islamic mutual funds	Malaysia	NAV, Sharpe, Treynor, Jensen alpha and modified Value at Risk	The results show there is no clear-cut over performance by Islamic mutual funds against their conventional peers across the three financial crises. However, results show that Islamic funds did significantly outperform conventional during the recent financial crises. the study further indicates that Islamic mutual funds have better risk management compared to conventional peers.
SA	Merdad, Hassan, and Alhenawi (2010) Journal of King Abdulaziz University: Islamic Economics	Islamic versus Conventional Mutual Funds Performance in Saudi Arabia: A Case Study	a sample of 28 Saudi mutual funds managed by one fund manager to examine the performance of 12 Islamic funds relative to 16 conventional funds during the period from 2003 to 2010	Saudi Arabia	Sharpe, Treynor, Modigliani and Modigliani (MM), TT, Jensen alpha, and Treynor and Mazuy.	Islamic funds underperform conventional funds during both full and bullish periods but outperform during bearish and financial crisis periods. They find that the funds' managers are good at showing timing and selectivity skills for Islamic funds during the bearish period, and for conventional funds during the bullish period.

Type	Author/Year/Journal	Title of the Article	Sample Size	Location	Measures Used	Findings
SA	Barakat, A., Nazmy, E., & Al-Jabali, M. A. (2011). International Research Journal of Finance and Economics, (81).	Constraints Affecting the Efficiency of Mutual Funds in the Saudi Financial Market.	24 fund managers 24-questionnaires distributed, 19 were returned.	Saudi Arabia	Several statistical methods used to analyze the data, such as frequency distributions and averages and computational test (v) mono	The efficiency of mutual funds in the Saudi market affected by the weakness of the organizational structure, management style of mutual funds, lack of clear objectives, financial strategies, and long-term investments, and some other factors.
SA	Merdad, H., Hassan, M. K., & Hunt-Ahmed, K.(2013) Contemporary Islamic finance: Innovations, applications, and best practices, 303-321.	Islamic Mutual Funds' Performance in Saudi Arabia	a sample of 143 mutual funds available in Saudi Arabia during the period from July 2004 to January 2010.	Saudi Arabia	NAV, Sharpe and Modified Sharpe Ratios, Modigliani and Modigliani, Treynor Ratio, and TT Index	the total risk results indicate that statistical evidence exists to show that the Islamic fund portfolio is less risky than the conventional fund portfolio with no statistical evidence that its performance differs than the conventional funds. Risk-adjusted performance measures show that the locally focused Islamic funds perform less badly than its peer during both the bear and financial crisis periods.
SA	Ashraf, D. (2013). International Journal of Islamic and Middle Eastern Finance and Management	Performance evaluation of Islamic mutual funds relative to conventional funds: Empirical evidence from Saudi Arabia	159 mutual funds listed on the Saudi Arabian stock market from 2007 to 2011	Saudi Arabia	CAPM regression and Treynor and Mazuy models	The empirical results show that Islamic mutual funds, on average, perform better than conventional funds during the economic crisis. Furthermore, the results on stock selection ability indicate that Islamic mutual funds' managers possess superior stock selection ability than conventional mutual funds' managers

Type	Author/Year/Journal	Title of the Article	Sample Size	Location	Measures Used	Findings
SA	Al Rahahleh, Naseem, and Bhatti, Ishaq. Faculty of Economics and Administration, King Abdulaziz University, Jeddah; August 2017	Mutual Fund Performance in Saudi Arabia: Do locally focused equity mutual funds outperform the Saudi Market?	39 locally focused equity funds, 25 Sharia-Compliant funds, and 14 conventional funds from 2007 to 2016	Saudi Arabia	Sharpe ratio, the Treynor index, and the Modigliani-Modigliani measure, the Capital Asset Pricing Model (CAPM), and the Carhart four-factor model	The non-risk adjusted returns show that Islamic funds produced a significantly higher return than their benchmark during 2014 and a significantly lower return than their benchmark during 2016. Results based on the risk-adjusted measures, Islamic mutual funds slightly underperformed their benchmark on the basis of the SR and TR.
SA	El-Masry, A. A., & El-Mosallamy, D. A. (2016). Corporate Ownership & Control, 13(4), 89-102	A comparative study of the performance of Saudi mutual funds	21 Saudi equity funds 10 Islamic and 11 conventional equity funds over the period 2006-2011	Saudi Arabia	CAPM, downside CAPM (D-CAPM) models and Fama and French 3-factor model	On average, Islamic mutual funds are outperforming conventional mutual funds and the market portfolio.