



Analysis of Selectivity, Timing, Persistence and Correlation of Islamic vs. Conventional Saudi Mutual Funds

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Abstract: The purpose of this study was to evaluate the selectivity and timing performance and persistence in active Saudi mutual funds through a comparative work involving 100 Islamic funds against 51 conventional funds trading in Saudi TADAWUL stock Exchange from 2010 to 2015. We have split each group based on 6 regional investment categories: Local, International, Arab, Asian, European and American (US). We employed specific models to assess selectivity and timing performance. Then we investigated their persistence. Findings indicated superior selectivity with Arab Islamic funds compared to conventional peers and similar negative selectivity in both Islamic and conventional International funds. In addition, there was evidence of selectivity with US conventional funds, and none with Islamic peers. Furthermore, results showed significantly higher timing with local and Arab conventional funds compared to their respective Islamic peers. As for the performance persistence, there were signs of selectivity and timing persistence for both Islamic and conventional funds, mostly on local, International and Arab levels. Nevertheless, Islamic funds' performance persistence in both skills was longer. Finally, both Islamic and conventional selectivity and timing were negatively correlated overall, indicating skills' mutual exclusiveness and specialization. We recommend studying a larger sample, for a longer period. Different grouping may be applied, based on asset classes, i.e. Equity, Bond, Balanced, Income, etc. The study can even extend to a multi-market or multi-regional investigation i.e. MENA region.

Keywords: Mutual Funds, Islamic, Conventional, Performance, Selectivity, Timing, Persistence, Correlation

1. Introduction

Mutual funds are investment vehicles that pool Individual and institutional financial resources and invest in tradable financial securities. They offer liquidity, portfolio diversification, and investment expertise. Successful, mutual funds can be an important economic growth pillar that allows for efficient draining of small savings, and contributes to building a well-functioning economy. Mutual funds are designed to offer better investment options and a wider access to different asset classes and securities, which were otherwise out of reach for small investors. The diversification offered, not only helps mitigate systematic risk, but also opens up potential rewards through broader investment horizon. Moreover, mutual funds usually have low capital requirement,

provide affordable professional management expertise and charge lower brokerage commissions as transaction size increases [1].

Major studies have shown that fund return is related to management performance. Funds' performance were attributed to management stock-picking skills or selectivity, and market movement forecasting ability or timing [2-6]. Selectivity or micro-forecasting is the talent to pick the appropriate, undervalued securities, to construct, rebalance and reconstitute investment portfolio through active, informational motivated strategies. Market timing is the ability to macro-forecast market movements, to take on the appropriate actions for a

favorable market ride.

Despite the abundant literature on selectivity and market timing performances in explaining funds' excess returns, findings were mostly mixed and inconclusive. This research is addressing this issue. More specifically, it tries to empirically assess and compare the effectiveness of both selectivity and market timing on Islamic and Conventional actively managed mutual funds trading in TADAWUL Saudi capital market for a 6-year post financial crisis period, running from 2010 to 2015. In addition, we are extending the study to investigate micro and macro-forecasting skills' performance persistence and correlation.

Islamic mutual funds face more restrictions relative to their conventional peers as they can only allocate in permissible financial securities and assets classes (Sharia compliant securities). Therefore, it will be interesting to investigate the relevance of selectivity and market timing skills, under such restrictions.

The remainder of the study is organized as follow: Section 2 presents previous literature on the topic. Section 3 describes the research statement, sample and the research methodology. Section 4 shares the findings, discusses the results, and offers an overall summary. Section 5 provides concluding remarks, limitations and recommendations.

2. Literature Review

2.1. Conventional Funds' Selectivity and Timing

Many studies found no statistically significant selectivity and timing performances for conventional funds [7-15]. Other studies showed statistically significant evidence for timing, but no signs of selectivity [16-20]. Some on the other hand, found statistically significant evidence for selectivity but no timing [21-25]. However, some other findings evidenced statistically significant results for both selectivity and timing [26-29].

2.2. Islamic Funds' Selectivity and Timing

Some researches on Islamic funds found no statistical evidence of selectivity and timing [30-31]. Other studies showed statistically significant evidence for selectivity but not for timing [32-34]. Meanwhile, Triyonowati Et Al were successful in finding strong evidence for both selectivity and timing [35].

2.3. Islamic vs. Conventional Funds' Selectivity and Timing

Two studies on Egyptian funds [36, 37], and another on Gulf funds [38], showed no signs of any significant difference between conventional and Islamic funds' selectivity and timing performance. Whereas other researches on Malaysian funds showed superior selectivity, though inferior timing for the Islamic funds versus their conventional peers [39, 40].

As for the Saudi Arabia funds, Merdad Et Al worked on HSBC funds trading in TADAWUL composed of 12 Islamic

funds and 16 Conventional funds, from 2003 to 2010. They found evidence of both selectivity and timing for both funds. Skills were however more pronounced in Islamic funds in downturns and less in upswings [41]. Merdad and Massan studied 143 Saudi funds, 96 Islamic and 47 conventional funds from 2003 to 2010. However, they haven't found any evidence for micro and macro-forecasting skills in both fund types [42]. Dawood on the other hand, worked on 159 Saudi funds, 116 Islamic and 43 Conventional funds and noticed signs of selectivity only in Islamic funds, but no timing overall [43].

2.4. Selectivity and Timing Performance Persistence

Nafis Et Al found signs of market timing persistence in conventional funds [40]. John argued that the performance persistence noticed in his sample, was mostly due to timing abilities [29]. Bilal on the other hand, investigated Indian mutual funds, and found signs of selectivity persistence, but no indication of timing performance consistency [44].

2.5. Selectivity and Timing Correlations

Cheng Et Al under both T&M and H&M models, found negative correlation between selectivity and timing, while, under Lee and Rahman model [45], found positive correlations [22]. However, Lehmann and Modest found no correlations between both micro and macro skills [46].

3. Data and Methodology

Based on 151 actively trading Saudi conventional and Islamic funds' excess returns, during the recovery and expansion period, from 2010 to 2015, this work aims to:

- 1) compare Islamic vs. conventional funds' management performance in terms of stock selection and market timing,
- 2) compare Islamic vs. conventional funds' selectivity and timing performances, and
- 3) Examine the correlation between selectivity and timing in both Islamic and conventional funds.

We started out with 274 funds from TADAWUL, from which. We chose the funds that were active during the entire study period from 2010 to 2015. The final sample accounted for 151 funds, 100 Islamic and 51 conventional. Each group is divided into 6 portfolios according the investment categories classification available in the Saudi exchange. The classification is essentially regional. The sample portfolios categories and their corresponding benchmarks are listed in table 1. Some portfolios have only 1 or 2 funds, that's because we're making sure that all funds must be active during the entire study period of 6 years (72 months) with a minimum of 68 months, therefore avoiding any survivorship bias. We chose to work on equally weighted portfolios as in Hoepner Et Al [47].

Table 1. Portfolios and Benchmarks List.

Investment Categories	Portfolios		Funds in Portfolios	Benchmarks	
	Names	Description		Names	Description
Overall	ISL	Islamic funds	100	MSCI ACWI I	MSCI All Countries World Index Islamic
	CONV	Conventional funds	51	MSCI ACWI	MSCI All Countries World Index
Local	LI	Local Islamic funds	51	MSCI SA I	MSCI Saudi Arabia Islamic
	LC	Local conventional funds	22	MSCI SA	MSCI Saudi Arabia
International	INT I	International Islamic funds	36	MSCI ACWI I	MSCI All Countries World Index Islamic
	INT C	International Conventional funds	21	MSCI ACWI	MSCI All Countries World Index
Arab	AR I	Arab Islamic funds	10	MSCI GCC I	MSCI Gulf Cooperation Council Islamic
	AR C	Arab Conventional funds	2	MSCI GCC	MSCI Gulf Cooperation Council
Asian	AS I	Asian Islamic funds	1	MSCI AC AS I	MSCI All Countries Asia Islamic
	AS C	Asian Conventional funds	3	MSCI AC AS	MSCI All Countries Asia
European	EUR I	European Islamic funds	1	MSCI EU I	MSCI Europe Islamic
	EUR C	European Conventional funds	1	MSCI EU	MSCI Europe
United States	US I	United States Islamic funds	1	MSCI US I	MSCI USA Islamic
	US C	United States Conventional funds	2	MSCI US	MSCI USA

MSCI: Morgan Stanley Capital International. Source: Authors

We used MSCI benchmarks and TASI (TADAWUL Saudi Index) as a proxy to local market. We are also adding the performance of “Difference Portfolios”, following Bauer Et Al’s work [48]. For instance, in the Arab category, Difference portfolio = Arab Islamic portfolio (AI) return – Arab Conventional portfolio (AC) return, for every month during the entire study period. These portfolios will be referred to by “DIFF” later.

3.1. Modified T&M and H&M Models

We are measuring selectivity and timing, based on both Treynor and Mazuy (T&M), and Henriksson and Merton (H&M) parametric models [2, 5]. However, we will be working with modified versions of the original models by adding Fama and French size and value [49], and Carhart momentum [50], following Bollen and Busse work [51], and accounting for a local bias factor as in Bauer and Otten [48]. We needed to capture major anomalies in the CAPM model on one hand, and any possible home bias that might be in part responsible for shaping investments and returns. Each model will test the other’s robustness for more accurate analysis. The modified versions of both models are as follow:

Modified T&M model:

$$(R_{p,t} - R_{f,t}) = \alpha_p + \beta_p(R_{M,t} - R_{f,t}) + \delta_p(R_{M,t} - R_{f,t})^2 + \beta_s \text{SMB}_t + \beta_v \text{HML}_t + \beta_m \text{MOM}_t + \beta_l \text{LOC}_t + \varepsilon_t \quad (1)$$

Modified H&M model:

$$(R_{p,t} - R_{f,t}) = \alpha_p + \beta_p(R_{M,t} - R_{f,t}) + D[\delta_p(R_{M,t} - R_{f,t})] + \beta_s \text{SMB}_t + \beta_v \text{HML}_t + \beta_m \text{MOM}_t + \beta_l \text{LOC}_t + \varepsilon_t \quad (2)$$

With:

$R_{p,t}$: Return on fund individual fund or portfolio p at month t, $R_{p,t} = (\text{NAV}_t - \text{NAV}_{t-1}) / \text{NAV}_{t-1}$ where NAV is the monthly average Net Asset Value of each portfolio

$R_{M,t}$: Return on market portfolio at month t,

$R_{f,t}$: Risk free rate at month t (1 month SIBOR: Saudi Interbank Offered Rate),

α_p : Selectivity measure of individual fund or portfolio p,

β_p : Systematic risk measure of individual fund or portfolio p,

δ_p : Timing coefficient of individual fund or portfolio p,

β_s : Size risk factor coefficient of individual fund or portfolio p,

β_v : Book-to-market risk factor coefficient of individual fund or portfolio p,

β_m : Momentum risk factor coefficient of individual fund or portfolio p,

β_l : Local factor sensitivity coefficient of individual fund or portfolio p,

SMB_t : Small cap portfolio return minus High Cap portfolio return at month t,

HML_t : High book to market (Value stock) minus Low book to market (Growth stock) portfolio return at month t,

MOM_t : Momentum or Winner minus Loser in portfolio return at month t,

LOC_t : Excess return of working benchmark over local benchmark at month t,

D: dummy variable that equals 0 if $R_{M,t} > R_{f,t}$ and -1 otherwise, and

ε_t : Error term with zero mean.

SMB (Small minus Big) and HML (High minus Low) values were determined based on Fama-French method. First, we organize funds from lowest to highest book to market value and group them into 3 groups, bottom 30%, medium 40% and high 30%. Next, we build 6 portfolios: small-low (S/L), small-medium (S/M), small-high (S/H), big-low (B/L), big-medium (B/M) and big-high (B/H), then we calculate monthly $\text{SMB} = 1/3*(\text{S/L} + \text{S/M} + \text{S/H}) - 1/3*(\text{B/L} + \text{B/M} + \text{B/H})$ and $\text{HML} = 1/2*(\text{S/H} + \text{B/H}) - 1/2*(\text{S/L} + \text{B/L})$. Portfolios were constructed as value-weighted and rebalanced monthly.

MOM (Winner minus Loser) values, were calculated following Carhart method. We start by ranking funds by Winners and Losers, winners top 30% and losers bottom 30%, medium as the remaining 40%. Next, we built 6 portfolios: small-winners (S/W), small-losers (S/L), big-winners (B/W), big-losers (B/L), medium-winners (M/W) and medium-losers (M/L). Then, we measure each portfolio monthly average return (based on each month’s funds past 10 months’ returns).

Finally we determine monthly MOM = $1/2*(S/W + B/W) - 1/2*(S/L + B/L)$. Portfolios were constructed as value-weighted and rebalanced monthly.

Next, we will investigate selectivity and timing performance persistence across the study period by employing parametric and non-parametric tests. First, we need to divide our timeframe into sub-periods and ranges as follow in table 2:

Table 2. Sub-Periods and Ranges.

Sub-Period	Year	Range	Intervals	In years
P1	2010			
P2	2011	1	P1-P2	2010-2011
P3	2012	2	P2-P3	2011-2012
P4	2013	3	P3-P4	2012-2013
P5	2014	4	P4-P5	2013-2014
P6	2015	5	P5-P6	2014-2015

Source: Authors

Next, we apply the Cross-Sectional Regression parametric test, an auto-regression model following John [29], then the Cross product Ratio (CPR) and the Chi Square test statistic non-parametric tests.

3.2. Cross-Sectional Model

Represented by the following regression:

$$X_t = a + b*X + \varepsilon_t \quad (3)$$

With:

X_t : Periodic selectivity or timing of portfolio at period t under modified T&M or H&M,

A: Intercept,

b: Performance coefficient, and

ε_t : Error term with zero mean.

We are regressing yearly selectivity and timing coefficients based on both yearly modified T&M and H&M regressions results. It helps us determine signs of both selectivity and timing performance persistence across sub-periods. The general rule is that if the sensitivity or performance persistence factor b is positive and statistically significant, it would confirm a performance persistence of the parameter from $t-1$ to t . If it is negative however, that is a sign of non-existence.

3.3. Cross-Product Ratio (CPR) Test

We start by determining the CPR ratio, as the performance persistent mutual funds over non-persistent ones for each sub-period range. The formula is as follow:

$$CPR = \frac{WW*LL}{WL*LW} \quad (4)$$

With, as defined by Agarwal, V. & Narayan [53]:

WW: when manager is a Winner in 2 consecutive sub-periods,

LL: when manager is a Loser for 2 consecutive sub-periods,

WL: when manager is a Winner during a sub-period, then a Loser in the next one, and

LW: When manager is a Loser during a sub-period then a Winner in the next one.

Next, we determine the Z-STAT for signs of selectivity or timing performance persistence. We compare the Z-STAT to the Z values from the Standard Normal Distribution table relative to common P-values ranging from 1% to 10%: 1% - 2.5% - 5% - 7.5% - 10%. If the Z-STAT is higher than the corresponding value on the table, it is then indicative of a performance persistence, otherwise, no persistence is registered.

$$Z\text{-STAT} = \frac{\text{Ln}(\text{CPR})}{\sigma_{\text{Ln}(\text{CPR})}} \quad (5)$$

With: $\sigma_{\text{Ln}(\text{CPR})} = \sqrt{\frac{1}{WW} + \frac{1}{LL} + \frac{1}{WL} + \frac{1}{LW}}$ as the standard error of the Normal Logarithm of CPR [52].

3.4. Chi-Square Test

It compares the distribution of the observed frequencies relative to the 4 outcomes WW, LL, WL, LW, for each investment strategy with the expected frequency distribution. We define the Chi Square as follow [53]:

$$\chi^2_{\text{Cal}} = \frac{(WW-D_1)^2}{D_1} + \frac{(WW-D_2)^2}{D_2} + \frac{(WW-D_3)^2}{D_3} + \frac{(WW-D_4)^2}{D_4} \quad (6)$$

With:

$$D_1 = ((WW + WL) * (WW + LW))/N,$$

$$D_2 = ((WW + WL) * (WL + LL))/N,$$

$$D_3 = ((LW + LL) * (WW + LW))/N,$$

$$D_4 = ((LW + LL) * (WL + LL))/N, \text{ and}$$

N: Number of mutual funds in the group or Portfolio.

Chi Square test is considered as better defined, highly powerful and more robust than the CPR test [54]. Once CHI-STAT is determined in every sub-period range, we compare each value to corresponding values from the Chi-Square Distribution table with P-values from 1% to 10%: 1% - 2.5% - 5% - 7.5% - 10%, with a degree of freedom of 1. Using the same rule as in CPR based test, if the CHI-STAT is higher than the CHI-SQUARE corresponding to the above P-values, it indicates a performance persistence during the corresponding sub-period range. Otherwise, there no persistence in management skills is registered. Finally, we will be looking for the correlation between selectivity and timing in both Islamic and conventional portfolios. However, we will restrict our investigation to the larger portfolios, namely Overall ALL, Islamic ISL and conventional CONV portfolios, for a wider outlook. We want to know if management skills have been applied in conjunction or were mutually exclusive, indicative of skill specialization. If the correlation coefficient is positive that's a sign of skill synergy. If the coefficient is negative, that's an indication of mutual exclusiveness.

4. Empirical Findings and Discussion

4.1. Excess Return Analysis

Prior to analyzing management selectivity skills and timing abilities, we looked at each portfolio's excess return over the

monthly Saudi risk free rate SIBOR, to provide an insight on their overall performances. Table 3 displays fund portfolios' excess return results. Findings show that aside from Arab and US portfolios and the European conventional portfolio, our portfolios showed negative mean excess return, indicative of an underperformance over a buy and hold strategy. Overall, conventional portfolios showed similar to higher performance or less underperformance relative to their respective Islamic counterparts. Islamic funds however, showed higher excess return than their conventional peers on the Arab front, as indicated by the Arab difference portfolio result. Meanwhile Islamic funds showed significantly lower results in the US region, based on the corresponding difference portfolio outcomes. Both Islamic and conventional portfolios appear to enjoy comparable volatilities within each category.

Table 3. Portfolios Excess Return Analysis.

Categories	Portfolios	Mean %	Median %	Std. Dev. %
Overall	ISL	-0.10	-0.04	2.63
	CONV	-0.13	-0.17	2.78
Difference	DIFF	0.03	0.01	0.78
Local	LI	-0.06	0.25	3.04
	LC	-0.09	0.42	3.93
Difference	DIFF	0.03	0.09	1.43
International	INT I	-0.28	-0.48	2.21
	INT C	-0.27	-0.17	2.08
Difference	DIFF	0.01	0.04	0.82
Arab	AR I	0.33	0.23	4.66
	AR C	0.23	0.45	4.65
Difference	DIFF	0.10	0.22	1.74
Asian	AS I	-0.29	-0.58	4.74
	AS C	-0.12	0.03	4.67
Difference	DIFF	-0.16	-0.12	2.00
European	EUR I	-0.11	0.29	4.07
	EUR C	0.20	0.39	4.08
Difference	DIFF	-0.31	0.09	3.44
United States	US I	0.23	0.88	4.09
	US C	0.44	0.98	3.76
Difference	DIFF	-0.21	-0.17	2.13

Source: Authors

4.2. Selectivity and Timing Performance Analysis

4.2.1. Analysis of Islamic Funds

Moving on to selectivity and timing performances, table 4 presents the comparative skills' results under corresponding Islamic benchmarks in both modified T&M and H&M models. Selectivity results show that overall, under both modified T&M and H&M models, conventional portfolios enjoyed higher selectivity, with the exception of the Arab portfolios, as confirmed by the difference portfolios coefficients. Nevertheless, the predominance of Islamic funds' selectivity on the Arab front is the only finding that is statistically significant.

The corresponding Arab difference portfolio is shows a positive 0.00661 coefficient in modified T&M model, and 0.0080 coefficient in H&M modified model, both at 1%, confirming such a claim. In addition, modified H&M model shows a statistically significant positive selectivity coefficient of 0.00443 at 10% from the US conventional portfolio. The Islamic US counterparty displayed a lower positive selectivity value, though with no statistical evidence. Although the US difference portfolio result points out the superior stock picking skill by conventional US funds, the findings remain without statistical evidence.

Timing results are showing statistically significant negative timing performance with both Islamic and conventional overall fund portfolios, -0.12819 and -0.14326 respectively, based on modified H&M findings. The same model is also indicating a statistically higher market timing in conventional funds than in Islamic peers, on the local front, as indicated by the difference portfolio coefficient -0.18236 at 10% level.

In addition, both models statistically confirm positive macro-forecasting performance in Arab conventional funds at 5%, with 1.6206 in modified T&M and 0.33227 in modified H&M, and superior timing performance compared to Islamic counterparts at 1% as shown by the Arab difference portfolios coefficients -2.12051 in modified T&M and -0.35344 in modified H&M. Overall, under Islamic benchmarks, combined models' findings are showing, with statistical evidence, higher selectivity with Islamic funds in the Arab front, significantly lower timing with Islamic funds, in both local and Arab regions.

Table 4. Selectivity-Timing Performances under Islamic Benchmarks.

Islamic Benchmarks	Categories	Portfolios	Modified T&M			Modified H&M		
			Selectivity	Timing	Adj. R ²	Selectivity	Timing	Adj. R ²
MSCI ACWI I	Overall	ISL	0.00042	-0.54096	91%	0.00149	-0.12819*	91%
		CONV	0.00077	-0.53091	92%	0.00209	-0.14326**	92%
	Difference	DIFF	-0.00034	-0.01005	18%	-0.00060	0.01507	18%
MSCI SA I	Local	LI	-0.00006	-0.08711	89%	-0.00003	-0.01300	89%
		LC	-0.00060	0.34382	84%	-0.00241	0.16936	84%
	Difference	DIFF	0.00054	-0.43093	24%	0.00238	-0.18236*	27%
MSCI ACWI I	International	INT I	-0.00174	-0.23595	88%	-0.00129	-0.05456	88%
		INT C	-0.00122	-0.01002	89%	-0.00095	-0.01851	89%
	Difference	DIFF	-0.00052	-0.22593	10%	-0.00035	-0.03605	9%
MSCI GCC I	Arab	AR I	0.00379	-0.49991	87%	0.00330	-0.02117	87%
		AR C	-0.00281	1.62060**	85%	-0.00470	0.33227**	85%
	Difference	DIFF	0.00661***	-2.12051***	19%	0.00800***	-0.35344***	12%
MSCI AC AS I	Asian	AS I	0.00097	-0.00022	80%	0.00075	0.01543	80%
		AS C	0.00379	-0.55866	84%	0.00412	-0.07724	84%
	Difference	DIFF	-0.00282	0.55844	-1%	-0.00336	0.09267	-2%

Islamic Benchmarks	Categories	Portfolios	Modified T&M			Modified H&M		
			Selectivity	Timing	Adj. R ²	Selectivity	Timing	Adj. R ²
MSCI EU I	European	EUR I	0.00242	-0.90759	75%	0.00500	-0.23315	75%
		EUR C	0.00274	0.67198	66%	0.00114	0.15340	66%
	Difference	DIFF	-0.00059	0.23426	-1%	-0.00063	0.03380	-2%
MSCI US I	American	US I	0.00046	-0.84108	66%	0.00131	-0.14572	66%
		US C	0.00307	-0.97557	89%	0.00443*	-0.19583	89%
	Difference	DIFF	-0.00261	0.13449	-4%	-0.00312	0.05011	-4%

Statistical significance of 1% is ***, of 5% is **, of 10% is *. Source: Authors

4.2.2. Analysis of Conventional Funds

Table 5 displays both models' regressions results under conventional indices. Findings seem to indicate a relatively

similar selectivity and timing performances as under Islamic indices. We notice overall higher selectivity with conventional funds. However, most lacked statistical significance.

Table 5. Selectivity-Timing Performances under Conventional Benchmarks.

Islamic Benchmarks	Categories	Portfolios	Modified T&M			Modified H&M		
			Selectivity	Timing	Adj. R ²	Selectivity	Timing	Adj. R ²
MSCI ACWI I	Overall	ISL	0.00007	-0.45992	91%	0.00067	-0.08890	91%
		CONV	0.00031	-0.41405	93%	0.00120	-0.10152	93%
	Difference	DIFF	-0.00025	-0.04587	20%	-0.00053	0.01262	20%
MSCI SA I	Local	LI	-0.00027	0.04172	89%	-0.00112	0.04678	89%
		LC	-0.00121	0.46873	84%	-0.00400	0.19631	84%
	Difference	DIFF	0.00094	-0.42701	25%	0.00288	-0.14953	26%
MSCI ACWI I	International	INT I	-0.00243**	-0.10447	88%	-0.00239	-0.01368	88%
		INT C	-0.00183*	0.12369	91%	-0.00187	0.01597	91%
	Difference	DIFF	-0.00059	-0.22816	8%	-0.00052	-0.02965	8%
MSCI GCC I	Arab	AR I	0.00532**	-0.85559	88%	0.00585*	-0.12733	88%
		AR C	-0.00157	0.99961	86%	-0.00288	0.18650	86%
	Difference	DIFF	0.00689***	-1.85520***	16%	0.00873**	-0.31384**	12%
MSCI AC AS I	Asian	AS I	-0.00014	-0.12188	78%	0.00011	-0.02846	78%
		AS C	0.00247	-0.40518	85%	0.00251	-0.04233	85%
	Difference	DIFF	-0.00260	0.28331	-3%	-0.00240	0.01387	-3%
MSCI EU I	European	EUR I	0.00190	-0.55804	74%	0.00397	-0.17177	74%
		EUR C	0.00224	0.69466	68%	0.00122	0.14299	68%
	Difference	DIFF	-0.00039	0.11884	9%	-0.00058	0.02504	9%
MSCI US I	American	US I	-0.00177	-0.17756	67%	-0.00267	0.04464	67%
		US C	0.00136	-0.65901	92%	0.00220	-0.12254	92%
	Difference	DIFF	-0.00313	0.48145	-4%	-0.00488	0.16718	-3%

Statistical significance of 1% is ***, of 5% is **, of 10% is *. Source: Authors

Nevertheless, both models statistically confirmed positive selectivity coefficients in Islamic funds on the Arab front, and superior stock picking abilities than conventional peers based on the difference portfolio coefficients at 1%. In addition, based on modified T&M findings, both Islamic and conventional international funds are associated with negative selectivity coefficients at 5% and 1% respectively. Similar to table 4, timing results are also showing statistically significant higher performance with Islamic funds compared to conventional peers in the Arab category, as indicated by the difference portfolio coefficients -1.8552 and -0.31384 in modified T&M and modified H&M respectively. Therefore, under either Islamic or conventional indices, results seem to point out that in both models, there is a statistically significant indication of higher selectivity but significantly lower timing for Islamic funds compared to conventional counterparts, on the Arab front. Overall, the study's selectivity and timing performance results are quite comparable to those of Mansor and Bhatti in terms of superior selectivity and inferior timing by Islamic funds managers [39].

4.3. Selectivity and Timing Persistence Analysis

4.3.1. Analysis with Cross-Sectional Regression

We also studied selectivity and timing persistence based on both parametric and non-parametric models. Table 6 shows results based on the parametric cross-sectional model represented by equation (3). As we have mentioned earlier, a positive coefficient proves the existence of a performance persistence across the years. A negative coefficient however, indicates otherwise. On the selectivity persistence factors from both models, there is no indication of stock-picking performance persistence across the sub-periods. Almost all selectivity persistence coefficients are negative. Local Islamic portfolio however, seems to enjoy some selectivity persistence. Nonetheless, none of the selectivity persistence results showed statistical evidence under both models.

Similarly, nearly all timing persistence coefficients are negative, with the exception of Arab Islamic funds. Nonetheless, most results lacked statistical evidence. The absence of timing performance is statistically confirmed however, in International

conventional funds at 10% under both models. In addition, there is a statistical evidence of European Islamic funds not enjoying timing persistence across the sub-periods, though this was only confirmed under modified T&M model.

Overall, there was no persistence registered for both

selectivity and timing across periods based on both models' periodic micro and macro-forecasting coefficients. On the other hand, the non-parametric tests are showing signs of performance persistence in both selectivity and timing during specific sub-periods ranges.

Table 6. Selectivity-Timing Persistence: Cross-Sectional Regression.

Categories	Portfolios	Modified T&M		Modified H&M	
		Selectivity Persistence	Timing Persistence	Selectivity Persistence	Timing Persistence
Overall	ISL	-0.50973	-0.16386	-0.54142	-0.13256
	CONV	-0.00465	-0.16864	0.10672	-0.03392
Local	LI	0.40889	-0.24877	1.03265	-0.30668
	LC	-0.09467	-0.41853	-0.15478	-0.26798
International	INT I	-0.37355	-0.45803	-0.38430	-0.42161
	INT C	-0.28629	-0.44171*	-0.26500	-0.50786*
Arab	AR I	-0.23688	-0.20423	-0.18480	-0.08203
	AR C	-0.33180	0.42940	-0.16036	0.55760
Asian	AS I	-0.09227	-0.52857	-0.12158	-0.46801
	AS C	-0.32908	-0.12002	-0.30864	-0.09035
European	EUR I	-0.04368	-0.7705*	-0.07342	-0.70920
	EUR C	-0.51871	-0.26123	-0.38077	-0.00498
American	US I	-0.11243	-0.25266	-0.15792	-0.18829
	US C	-0.43273	-0.67918	-0.11286	-0.00690

Statistical significance of 1% is ***, of 5% is **, of 10% is *. Source: Authors

4.3.2. Analysis with Cross-Product Ratio CPR Test

The CPR test results, presented in table 7, indicate signs of selectivity persistence in range 2, 4 and 5, based on combined models' findings. Nonetheless, selectivity persistence was mostly seen in the overall and local fund portfolios. Furthermore, we notice that the persistence is more prevalent with Islamic funds than with conventional funds. In fact, as we relax the P-value, Islamic funds appear to have statistically significantly enjoyed selectivity persistence in ranges 2, 4 and 5, while conventional funds have enjoyed the persistence only in range 2, as indicated in the overall and local portfolios results. It is important to mention that the overall portfolios results are mostly

affected by the performance of local funds as they represent the largest portion in both Islamic and conventional portfolios.

That is why overall portfolios findings are identical to the local ones. In addition, findings indicated a stock-picking performance persistence with International Islamic funds in range 2, and none with their conventional counterparts. The remaining fund portfolios failed to show any sign of selectivity persistence in our case. As for timing, results showed no persistence in every category for both Islamic and conventional funds, based on both models, except with Arab Islamic funds, which enjoyed timing persistence however only during the 5th range at 10% level.

Table 7. *Selectivity-Timing Persistence: CPR Test.*

[illegible]

We worked with P-values 1%, 2.5%, 5%, 7.5% and 10%, to determine the level of statistical significance. Source: Authors

Table 8 displays the QUI-SQUARE test results. The test has shown additional findings compared to the CPR test, confirming its superiority to other models [54]. As for the selectivity persistence, both overall Islamic and conventional portfolios are exhibiting quite similar persistence under modified T&M. However, there were signs of a longer persistence with the overall Islamic funds under modified H&M and established all across the study period, as we relax the P-values from 1% to 10%.

Local conventional funds, on the other hand, mostly showed beginning of period selectivity persistence from range 1 to 3, in both models. In addition, longer selectivity persistence was evident with Islamic funds on the international front, in most part during the first 3 ranges, until year 4 under modified T&M, and in range 1 and 4, until year 5 under modified H&M, compared to conventional peers in the same category, with a mere first range persistence under both models. Findings also indicated a single range selectivity persistence for the Arab Islamic funds in range 4 under modified T&M and range 3 under modified H&M. Arab

On timing persistence, both models showed longer persistence with Islamic funds, overall and internationally vs. their corresponding peers. The timing persistence was mostly evidenced in the second, fourth and fifth ranges. The conventional funds persistence however, occurred in the first and to a lesser extend, in the fifth range. In addition, on both local and Arab fronts, timing performance was persistent only with Islamic funds. No signs of persistence was registered with the corresponding conventional peers. Local Islamic portfolio timing persistence was seen in ranges 4 and 5, under modified T&M. However, it was extended all across the study period, under modified H&M, from 5% p-level and up. On the other hand, the Arab Islamic portfolio showed timing persistence in range 4 under modified T&M, and in both fourth and fifth ranges, under modified H&M.

Finally, findings displayed a single fifth range timing persistence with Asian conventional funds under modified T&M, and no evidence of any persistence with their Islamic peers under both models.

Table 8. *Selectivity-Timing Persistence: QUI-SQUARE Test.*

[illegible]

Categories	Portfolios	Modified T&M									
		Selectivity Persistence					Timing Persistence				
		1%	2.5%	5%	7.5%	10%	1%	2.5%	5%	7.5%	10%
European	EUR I										
	EUR C										
American	US I										
	US C										

Categories	Portfolios	Modified H&M									
		Selectivity Persistence					Timing Persistence				
		1%	2.5%	5%	7.5%	10%	1%	2.5%	5%	7.5%	10%
Overall	ISL	1+2+5	1+2+4+5	1+2+4+5	1+2+3+4+5	1+2+3+4+5	1+4	1+4	1+4	1+4+5	1+4+5
	CONV	1+5	1+5	1+5	1+4+5	1+4+5		1	1	1	1
Local	LI	1+2+5	1+2+3+5	1+2+3+4+5	1+2+3+4+5	1+2+3+4+5	5	5	5	1+2+4+5	1+2+4+5
	LC	2+3	2+3	1+2+3	1+2+3	1+2+3					
International	INT I	1	1	1+4	1+4	1+4	1+3	1+3	1+3+4	1+3+4	1+3+4
	INT C		1	1	1	1	1	1	1+5	1+5	1+5
Arab	AR I				3	3				4+5	4+5
	AR C										
Asian	AS I										
	AS C					1					
European	EUR I										
	EUR C										
American	US I										
	US C										

We worked with P-values 1%, 2.5%, 5%, 7.5% and 10%, to determine the level of statistical significance. Source: Authors

4.4. Selectivity and Timing Correlation

As a final step, we looked into the correlation between selectivity and timing in each of the Islamic and Conventional portfolios, overall. Table 9 findings revealed overall statistically significant negative correlation between

selectivity and timing, overall, under either modified models. It indicates that both skills seem to be mutually exclusive, indicative of skill specialization.

The skills specialization seems to be more prevalent with conventional funds under modified H&M. Our findings are in line with Cheng Et Al [22].

Table 9. Selectivity-Timing Correlation.

Categories	Portfolios	Modified T&M	Modified H&M
		Coefficient %	Coefficient %
Overall	ISL	-41***	-42***
	CONV	-35**	-72***

Statistical significance of 1% is ***, of 5% is **, of 10% is *. Source: Authors

4.5. Empirical Results Summary

Table 10 provides a summary of the major study's empirical results, by performance, persistence and correlation

of both stock selection skills and market timing ability of Islamic and conventional funds, under modified T&M and H&M models.

Table 10. Summary of Empirical Findings.

		Modified T&M Model		Modified H&M Model	
Performance	Selectivity	Evidence in Arab and International funds: Higher selectivity with Arab Islamic funds than with conventional peers under both corresponding benchmarks. Almost similar negative selectivity for International Islamic and conventional funds under corresponding conventional benchmark		Evidence in Arab and US funds: Higher selectivity with Arab Islamic funds than with conventional peers, under both corresponding benchmarks. Positive selectivity in US conventional funds under Islamic benchmark, no statistical evidence of selectivity with Islamic peers.	
	Timing	Evidence in Arab funds: Higher timing with Arab conventional funds compared to Islamic peers under both corresponding benchmarks.		Evidence in local and Arab funds: Higher timing with local conventional funds than with Islamic peers under corresponding Islamic benchmark. Higher timing with Arab conventional funds under both corresponding benchmarks compared to Islamic peers.	
Persistence	Selectivity	Cross-Section	No evidence of persistence.	No evidence of persistence.	
		CPR	Evidence in Overall, local and International funds: Longer persistence in overall and local Islamic funds compared to	Evidence in Overall and local funds: Persistence only in overall Islamic funds. Longer persistence in	

		Modified T&M Model	Modified H&M Model
	Chi-Square	conventional peers. Persistence only in International Islamic funds, none in Conventional peers.	local Islamic funds than in conventional peers.
		Evidence in Overall, local, International and Arab funds: Similar persistence with overall Islamic and conventional funds. Longer persistence in Islamic funds compared to conventional peers, locally and Internationally, compared to Islamic peers. Persistence only with Islamic funds, on the Arab front.	Evidence in Overall, local, International, Arab and Asian funds: Longer persistence in overall, local and International Islamic funds than in conventional peers. Persistence only with Islamic funds, on the Arab front and only with conventional Asian funds, none with opposing peers.
		Evidence in International and European funds: Sign of no timing persistence with International conventional funds and European Islamic funds.	Evidence in International funds: sign of no timing persistence with International conventional funds.
	Cross-Section	No evidence of persistence.	Evidence in Arab funds: Single persistence with Arab Islamic funds, none for conventional peers.
	CPR	Evidence in Overall, local, International, Arab and Asian funds: Longer persistence with overall and International Islamic funds, compared to conventional peers. Persistence only with Islamic funds on local and Arab fronts and only with Asian conventional funds, none with opposing peers.	Evidence in Overall, local, International and Arab funds: Longer persistence with Islamic funds overall and Internationally, compared to conventional peers. Persistence only with Islamic funds on local and Arab fronts.
Timing	Chi-Square	Negative correlation with Islamic and conventional funds overall. Sign of skills' specialization.	Negative correlation with Islamic and conventional funds overall. Sign of skills' specialization.
	Correlation		
Selectivity & Timing			

Source: Authors

5. Conclusion

This research examined the relevance of stock selectivity, market timing performance and their respective persistence in explaining excess returns of 100 Islamic funds against 51 conventional funds trading in Saudi TADAWUL stock Exchange from 2010 to 2015. We divided each group into 6 regional investment categories: local, International, Arab, Asian, European and American (US). We applied modified versions of Treynor and Mazuy (T&M), and Henriksson and Merton (H&M) for performance analysis [2, 5]. We employed a parametric cross-sectional regression, and non-parametric CPR and Chi-Square tests for performance persistence investigation.

The results showed significantly higher selectivity with Arab Islamic funds compared to conventional peers and similar negative selectivity with both Islamic and conventional International funds. In addition, there were signs of selectivity with US conventional funds, though none with Islamic peers. Furthermore, local and Arab conventional funds enjoyed significantly higher timing performance, compared to their respective Islamic counterparts.

Next, the performance persistence main findings showed signs of selectivity and timing persistence with both Islamic and conventional funds, mostly on local, International and Arab fronts. However, both selectivity and timing performance persistence were usually longer with Islamic funds. Finally, selectivity and timing correlations in both Islamic and conventional funds were negative overall, indicating management skills' specialization or mutual exclusiveness for higher returns.

The originality of this study resides in a comparative study of Islamic and conventional funds' performances that offers stock selection skills and market timing ability performance investigation along with, selectivity and market timing

performance persistence all in a single work. We believe that our findings may contribute to the growing evidence that Sharia compliant mutual funds can be viable and competitive alternatives to comparable performances relative to conventional peers, despite a more restrained investment environment due to Sharia restrictions. Sharia compliant investments can generate both financial returns and social benefits, with risk-return balance. They're not only alternatives to regular risk averse investors, but also to socially responsible ones, looking to generate some returns while considering the ethical and social implications of their investments. Successful investments can generate more Zakat into the community, which has a direct social and economic benefit.

It is important to mention that, our results, although significant, are sample size and period specific. They should not be taken out of context, or claimed as a fact for Islamic mutual funds elsewhere. Furthermore, we were limited to a maximum of 6-year available data from TADAWUL, and by the lack of academic work on Islamic funds' selectivity and timing performance. We recommend to investigate a larger sample from the Saudi market, for a longer timeframe, possibly with different grouping, based on asset classes, rather than region, i.e. Equity, Bond, Balanced, Income, etc. for both Islamic and conventional funds. The investigation can also take a multi-market or multi-regional i.e. MENA region, or global scale. A large-scale investigation would carry much greater implications and help uncover major faith-based mutual funds' trends and dispositions that could later be applied as reliable benchmarks in future related investigations.

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