Is Ethical Money Sensitive to Past Returns? The Case of Portfolio Constraints and Persistence in Islamic Funds

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Abstract

In this paper, we analyze the performance persistence and survivorship bias of Islamic funds. The remarkable growth of these types of ethical funds raises the question of how non-financial attributes, including beliefs and value systems, influence performance and its persistence. A procedure commonly used in prior literature to assess persistence is the measuring of the performance of investment strategies based on past performance. In this context, we propose a refined version of this methodology that controls the cross-sectional significance of the performance of these strategies. This procedure correctly identifies whether abnormal performance is due to a dynamic investment strategy based on past performance, or whether it is obtained by investing in a particular set of mutual funds. The significance of the persistence varies depending on the time horizon (yearly/half-yearly), survivorship, or the tail of the distribution. In particular, we find that persistence only exists for the best funds, whereas for the worst funds, the results are not significant.

Keywords: Islamic funds, SRI funds, performance, persistence

JEL Classification: G2, N25, Z12

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1. Introduction

A large amount of the financial economics literature has dealt with the understanding of the performance of mutual funds, given its large impact on wealth. Consequently, it has great relevance to investors, managers, and academics alike. Both individual and institutional investors have an interest in the performance persistence of these funds. In particular, they focus on the methods used to measure performance which can then guide fund managers to produce the best future results. Thus, most individual investors and their advisors spend a large amount of time studying the past performance of the funds.

Given the current state of the literature, one might infer that the conclusions made with regard to the existence (or absence) of persistence might bear some degree of heterogeneity. Specifically, most of the literature tests persistence based on the correlation between period-to-period fund performances. These tests find that persistence exists over various horizons of one year or longer. Some studies (Hendricks et al. 1993; Goetzmann and Ibbotson 1994; Brown and Goetzmann 1995) attribute the short-term persistence to strategies based on common investments or "hot hands." However, others (Grinblatt and Titman 1992; Elton et al. 1993, 1996) find persistence over longer time horizons and attribute it to managerial stock-picking skills.

These results are partially explained in an influential paper written by Carhart (1997). Carhart finds that persistence is due to an omitted factor called the "momentum effect" as opposed to managers' skills—with the exception of the continuous underperformance of the worst performing funds. Conversely, as indicated by Busse et al. (2010), some studies find that when controlling for momentum, performance is predictable (Bollen and Busse 2005; Cohen et al. 2005; Avramov and Wermers 2006; Kosowski et al. 2006). Nonetheless, others find little to no evidence of persistence or skills (Barras et al. 2009; Fama and French 2010).

Nevertheless, the literature has evolved and recent contributions fail to agree on the existence (or lack of existence) of persistence. For instance, Quigley and Sinquefield (2000), Cuthbertson et al. (2008) and Massa and Patgiri (2009) have come to similar conclusions as Carhart (1997)—i.e., that there is no significant evidence of persistence in the analysis of investment strategies based on past performance. In other studies, such as Lynch and Musto (2003), Cohen et al. (2005) and Kosowski et al. (2006), the results show persistence among winners, but not among losers. Similarly, Wermers (2003) examines managers' momentum and finds evidence of persistence in superior growth funds. In contrast, Kosowski et al. (2006) use the net returns after trading costs and fees to show persistence in growth-oriented funds, with no evidence of managerial skills for income-oriented funds.

A particular branch of the literature that focuses on the performance of mutual funds has, over the past several decades, taken an interest in analyzing ethically oriented funds. Socially responsible funds (SRI) and Islamic funds are examples of ethical funds that ensure their portfolios are aligned with their beliefs and value systems when evaluating investments (Sauer 1997; Godlewski et al. 2013). These funds apply specific moral, social and financial criteria in order to screen their investments. Due to the fact that various ethical funds display distinctive styles of investment (Bauer et al. 2005) and apply different

screening criteria (Derigs and Marzban 2008), both the performance and its persistence are likely to be influenced by the various constraints applied.

In the particular case of Islamic funds, on which we focus, the empirical evidence available is considerably scarcer in comparison to the literature that focuses on SRI funds. There is only a handful of studies that compare the performance of these funds with their conventional or socially responsible counterparts (Ahmad and Ibrahim 2002; Girard and Hassan 2008; Hashim 2008; Albaity and Ahmad 2008; BinMahfouz and Hassan 2012; Dharani and Natarajan 2011; Mansor and Bhatti 2011). In this regard, several studies conclude that there is no particular difference in terms of the manner in which restricted Islamic funds perform *vis-à-vis* their conventional counterparts. Nevertheless, Abdelsalam et al. (2014b) find that depending on the quantile of the conditional distribution of the performance considered, SRI and Islamic funds are in the upper quantiles. Alam et al. (2013) analyzes the performance and resistance of Islamic and conventional unit trusts and finds that selectivity and market timing are mostly similar for both types of funds, however Islamic funds have shown better resistance to market downturn than their conventional counterparts. Nevertheless, the literature that focuses explicitly on the persistence of Islamic mutual funds is almost nonexistent (Alam et al. 2013; Abdelsalam et al. 2014a). Hence, our study contributes to filling this gap.

Islamic mutual funds, similar to SRI funds, invest in a restricted universe of assets and have very particular screening features, such as investing in *Shari'ah*-compliant assets.[1] Islamic funds extend financial filters on the selected equity according to the percentage of interest paid or received, as well as the leverage. Previous research found that restricted funds are more likely to experience greater stability when compared with their conventional counterparts (Askari et al. 2010). The stability of these restricted funds may lead to an expectation that there might be a payoff in terms of higher persistence.

The aims of this study are twofold: The first aim is to analyze the performance persistence of a large sample of Islamic funds in order to provide the empirical evidence lacking in prior literature. The second aim is to test for persistence by using a recursive portfolio approach in which investment strategies are based on past performance. This approach has been previously considered in the literature by Carhart (1997), Grinblatt and Titman (1993) and Fama and French (2010). We implement the recursive portfolio approach by means of two algorithms. The first approach has been widely applied in the literature, whilst the second is more innovative. The latter identifies whether the abnormal performance of funds results from a dynamic investment strategy based on past performance, or whether it is obtained by investing in a particular set of mutual funds. Therefore, we can generate synthetic portfolios and use their abnormal performance to test for the cross-sectional significance of the recursive portfolios. In a case where persistence exists, a recursive portfolio that invests in the worst (best) funds should show a negative (positive) abnormal performance that differs significantly from that obtained by a random strategy—that is, investing in the mutual funds without any particular criteria.

Our results show that while persistence generally exists, it is only significant for the best funds. Fur-

[1] *Shari'ah*-compliant assets avoid *Shari'ah* prohibited companies such as those dealing with alcohol, tobacco, arms, biotechnology for human cloning, and companies with heavy debt financing to avoid dealing with interest.

thermore, the results also vary when controlling for the time window (evidence of persistence is stronger under short-term horizons) and when performing a separate analysis for survivors and non-survivors (the evidence is slightly worse when only the former are considered). These findings for Islamic funds partly corroborate the previous findings for conventional funds (Carhart et al. 2002) and differ from the previous results for SRI funds. The results suggest that, although they are sometimes included under the same category of "ethical" funds (Renneboog et al. 2011), Islamic funds actually perform differently.

The remainder of the paper is structured as follows: Section 2 has a brief outline of some of the most important characteristics of Islamic funds. Section 3 provides details on the methods used to measure the funds' performance and persistence. Section 4 describes the data used in the study, and in Section 5 we present the results. Section 6 has the concluding remarks.

2. Some background on Islamic funds

Over the last 20 years, faith-based mutual funds, such as Islamic and SRI (socially responsible investments) funds have grown considerably. The speed of the growth of these two fund types has exceeded that of their conventional counterparts. This is likely due to the recent reports of the accounting and environmental scandals highlighted in the literature on business ethics (Bauer et al. 2007). The screening techniques of the faith-based funds combine the financial goals of the investors with their commitment to moral and/or social concerns (Hiagh and Hazelton 2004).

The SRI funds emerged in response to the views of religious groups who condemned investment in certain stocks deemed "sin" reserves. Thereafter the concept of SRI funds slowly developed by being enhanced and expanded by projects related to human rights, ecology, and anti-war stances. There are no recognized definitions that prevail for ESG, or Environmental, Social, and Governance principles, or SRI for that matter. Islamic equity investment started to gain relevance in 1994. In that year, under a new religious prescription (Hayat and Kraeussl 2011), Muslim investors received religious approval to trade in international stocks, subject to strict guidelines. Thereafter, Islamic investment rapidly increased. Investors from across the world have now begun to subscribe to the Islamic investment market and, according to Ernst & Young (2011), by the end of the 2000s, the Dow Jones, MSCI, and FTSE were offering over 800 Islamic equity indices.

There are five pillars in Islamic finance. Four of these pillars refer to prohibitions such as: investment in prohibited activities; dealings that involve *Riba*, or usury; *Gharar*, or excessive uncertainty; and Maysir, or speculation. The final pillar has to do with the promotion of the sharing of risks and returns (Shanmugam and Zahari 2009; Hayat and Kraeussl 2011). The running of Islamic funds is guided and monitored by a *Shari'ah* Supervisory Board (SSB), which consists of a panel of *Shari'ah* experts who closely monitor the companies and funds compliance with the Islamic pillars of finance.

In addition, Islamic funds exclude those investments that have fixed incomes;[2] for example, certificates

[2]It is considered discriminatory and unfair, by Islamic standards, to charge a fixed rate of interest on an investment loan. This is because the entrepreneur, or borrower, accepts the full risk, while the lender receives the set amount, whether or not the venture is successful. In contrast, the lender, when the profit is very high, will gain a relatively smaller portion of the profit. The borrower gains

of deposit, preferred stocks, and corporate bonds. They also impose further financial ratio screens on the chosen equity where, the percentage of interest received or paid out and the equity's leverage should not exceed a certain threshold, which is set by the SSB.

3. Performance and persistence measurement

3.1. Performance measurement

This section briefly describes the models used to measure the performance and the persistence of Islamic funds. In order to measure performance we use a linear model that adjusts the returns of a fund for different risk factors. This approach has been widely used in prior literature. After the development of asset pricing models, starting from Jensen (1968), many other studies have considered several factors, including those proposed by Fama and French (1993), and the momentum factor proposed by Carhart (1997). Furthermore, studies such as Sharpe (1992) and Elton et al. (1993) have also proposed linear models that consider several benchmarks or risk factors according to the style of the fund. Since our objective is to evaluate funds with a specific investment strategy and with a broad geographical scope for investment, we consider a linear model with multiple benchmarks more appropriate. We use the following expression:

$$r_{p,t} = \alpha_p + \beta_{p,w} r_{w,t} + \beta_{p,i} r_{i,t} + \beta_{p,m} r_{m,t} + \varepsilon_{p,t} \tag{1}$$

where $r_{p,t}$ is the excess return over the risk-free asset of the assessed fund. The constant in the model, α_p, measures the fund's abnormal performance. The risk factors are the excess returns, which correspond to: (i) a global benchmark representing investment in different markets around the world, $r_{w,t}$; (ii) a specific benchmark representing investment constrained by Islamic law, $r_{i,t}$; and (iii) a specific benchmark for investment in the Middle East or emerging markets, given the characteristics of the funds under analysis, $r_{m,t}$.

3.2. Persistence

With respect to the main objective of evaluating the performance persistence of a sample of Islamic funds, we will apply the *recursive portfolio approach* which was initially proposed by Carhart (1997). The *recursive portfolio approach* is one of the most commonly used methods in prior literature. Examples of its use include Bollen and Busse (2005), Busse et al. (2010), Fama and French (2010), and Kosowski et al. (2006), who have also proposed variations to this approach related to the statistical significance of the alphas. According to the recursive portfolio approach, persistence is assessed by analyzing the abnormal performance of portfolios that invest according to the past performance of the mutual fund. Persistence is calculated for two types of time periods, namely, semiannual and annual. This method is in line with the propositions in Alam et al. (2013). Specifically, these authors analyze the persistence of Islamic and conventional mutual funds by exploring the relationship between the performances estimated in two consecutive periods. If

the greater portion, which implies that there has been an uneven sharing of both profit and risk (Novethic 2009).

persistence exists, then it should imply a positive correlation. Moreover, in line with Alam et al. (2013), when estimating performance for a non-overlapping rolling window, we also allow the model parameters to be time-varying.

We propose to apply our recursive portfolio approach by means of the following algorithm (algorithm I):

1. We estimate the performance of the mutual funds by means of model (1) for the first period of the sample.

2. We then rank mutual funds in increasing order to form deciles according to the performance they achieved in the period.

3. At the beginning of the next period, we form ten equally weighted portfolios according to the deciles' past performance, $D_1, \ldots, D_{10}$. The first portfolio (D_1) invests in the worst performing funds from the previous period and conversely, the last portfolio (D_{10}) invests in the previous period's best funds. The same investment strategy is followed for the other deciles.

4. This procedure is repeated at the beginning of each period. Therefore, each portfolio represents a dynamic investment strategy that rebalances the selected funds in accordance with their previous performance.

5. We therefore compute the daily return of the ten portfolios and then estimate the abnormal performance of the portfolios also using model (1).

We hypothesize that where there is persistence in the performance of the mutual fund, a portfolio with investments based on a poor (good) past performance will show a negative (positive) abnormal performance. Once the abnormal performance has been estimated, we propose a cross-sectional test to control for the significance of these recursive portfolios. For instance, it could be the case that funds investing in a particular geographic area have a performance significantly different from zero due to their local idiosyncratic risk, rather than their managers' activity. Therefore, it could be the case that the recursive portfolio obtained a significantly different from zero performance, not because there is persistence in their managers' value added, but just because the funds are part of this portfolio.

In order to correctly identify whether this abnormal performance is due, precisely, to a dynamic investment strategy based on past performance, or whether it is obtained by investing in a particular set of mutual funds, we propose a cross-sectional test in which we compare the performance achieved by the recursive portfolio to those obtained *naively* following a randomly dynamic investment. The recursive portfolio follows an investment strategy based on past performance and therefore, in the case where persistence exists, its performance should differ significantly from that obtained by synthetic portfolios following a *naive* investment strategy. "Naive" recursive portfolios are formed using the same algorithm as the recursive portfolios, but switch from an investment strategy based on past performance to random picking of the funds that are part of the decile. Specifically, we apply another algorithm (algorithm II) in which:

1. In the first period of the sample, we randomly rank mutual funds to form deciles.
2. At the beginning of the next period, we form ten equally weighted portfolios.
3. This procedure is repeated at the beginning of each period, so that each one of the ten synthetic portfolios represent a dynamic investment strategy that rebalances the selected funds randomly.
4. We then estimate the abnormal performance of these synthetic portfolios using model (1).
5. Thus, for all of the recursive portfolios, we generate a set with a higher number of synthetic portfolios whose abnormal performances define a cross-sectional distribution with which to test significance.

This algorithm is repeated numerous times (5,000) and thus the abnormal performance of the synthetic portfolios define a cross-sectional distribution with which to test the significance of the abnormal performance of the ten recursive portfolios computed in algorithm I.

Therefore, although we now generate synthetic portfolios with the same method as the recursive portfolios, the dynamic investment strategy is based on random selection as opposed to the mutual funds' past performance. According to algorithm II, a recursive portfolio that invests in the worst (best) mutual funds should show a negative (positive) abnormal performance that differs *significantly* from that obtained by a random strategy that invests in the mutual funds without any particular criteria.

3.3. Performance persistence: theoretical background

This subsection aims to model mutual fund performance persistence according to the market environment and manager's ability. Previous studies have proposed a theoretical model for explaining the funds' performance. In this sense, Grinold (1989) and Grinold and Kahn (2000) share the contention that a fund's performance is directly proportional to two variables: (i) managerial ability and forecasting skills, and (ii) the number of independent forecasts that managers can do in a given time period. Defining performance measurement as the comparison of the fund's returns with those from benchmarks or passive management, Sharpe (1992) pointed out that, in order to add value, a mutual fund must differentiate the benchmarks from increasing idiosyncratic risk. In this regard, Kacperczyk et al. (2005) submit that on average, mutual funds that decide to deviate from a benchmark and concentrate their holdings in industries where they have informational advantages, perform better. In addition, Busse et al. (2007) find a positive relation between the performance of a mutual fund and the managers willingness to take big bets on a relatively small number of stocks. Huij and Derwall (2011) find that concentrated funds with higher levels of tracking errors display better performance than their more broadly diversified counterparts.

According to the literature cited previously, in order to add value, the manager must implement strategies or bets based on the differentiation toward a benchmark or market that represents passive investment. Thus, the performance of a given fund, p (α_p) is equivalent to aggregating the performance of each bet, j, in the market m ($\alpha_{p,j,m}$). Therefore, not unlike Grinold and Kahn (2000), we model the performance as a

function of the number of bets. Specifically, the fund's performance can be defined as:

$$\alpha_p = \sum_m \sum_j \alpha_{p,j,m} \tag{2}$$

The variable interacting with the bets is the manager's skill. Grinold and Kahn (ibid.) define the variable as the correlation between the forecast and the current value of the bet. We attempt to model the manager's success with two variables as follows:

$$\alpha_{p,j,m} = f(c_m, v_{p,j,m}) \tag{3}$$

The first variable, c_m, is the number of opportunities in the market. If the market is a game, then c_m is the game's ability to generate opportunities for success among its players. The second variable, $v_{p,j,m}$, is the relative ability of the manager of portfolio p with respect to bet j in market m. The ability of the managers, as players, is a direct result of the training, experience, and information they obtain from the market. It can be measured in relative terms with respect to the rest of the participants in a given market: both individual and professional investors—including fund managers amongst the latter. Therefore, the performance corresponding to the bets has a direct relation to the level of opportunities in a given market (c_m), as well as the manager's relative ability ($v_{p,j,m}$). Thus, the manager's performance for a given portfolio p with respect to a bet j in market m is expressed as follows:

$$\alpha_{p,j,m} = \begin{cases} f_h(c_m, v_{p,j,m}) & \text{if } c_m > c \\ f_l(c_m, v_{p,j,m}) & \text{if } c_m \leq c \end{cases} \tag{4}$$

where c is a parameter classifying markets between those with a high number of opportunities ($c_m > c$) and those with a low number of opportunities ($c_m \leq c$). The latter are usually those with a high level of systematic risk that offer fewer opportunities for success than the former, which has more specific risk and even incomplete securitization. The type of market (or game) determines expression (4) for markets with a higher number of opportunities $f_h(\cdot)$ or for markets with a low number of opportunities $f_l(\cdot)$. In this context, the effect of the relative ability $(v_{p,j,m})$ of the manager on the market is different. Hence, our hypothesis implies that in markets with a higher (lower) number of opportunities, the relative ability of the managers is more (less) relevant. We model the hypothesis as follows:

$$\frac{\partial f_h(c_m, v_{p,j,m})}{\partial v_{p,j,m}} > \frac{\partial f_l(c_m, v_{p,j,m})}{\partial v_{p,j,m}} \tag{5}$$

Thus, in markets with high idiosyncratic risk and consequently, a higher number of opportunities, it is possible that managers with greater ability have better prospects in terms of achieving persistent performance over time. As already noted, studies such as those by Sharpe (1992), Kacperczyk et al. (2005), Busse et al. (2007) and Huij and Derwall (2011) point out how bets involving differentiation, concentration and subsequently, idiosyncratic risk, are among the elements that enable the existence of abnormal

performance.

In contrast, the level of systematic risk is greater in markets with high levels of securitization and more highly correlated assets that decrease the number of opportunities. This decrease means that the ability of the managers is not as relevant as a variable as it would be in a market with opportunities. A market with these characteristics could be compared to a game in which the result is, to a large extent, random. This hinders the ability of managers to obtain positive abnormal performance which persists over time.

The results from the literature on the performance of mutual funds in the most developed markets affirm this view. Most of the funds achieve a non-zero performance; but more cases of negative performance appear. A market with high systematic risk and a low number of opportunities can motivate managers to show greater concern with regard to improving their ability to select bets that can beat the market.

This effort has two effects. Firstly, it can facilitate the reaching of a certain limit at which level of ability cannot be improved and, therefore, there might only be a few differences in the relative ability of most managers ($v_{p,j,m}$). This, together with a low number of opportunities, would imply that there are no major differences in the performance achieved and therefore, there is no evidence of persistence. Secondly, some managers under the pressure of being in a market with limited opportunities, could take highly risky bets. If the market really does have limited opportunities, it becomes difficult to improve the results at the efficient frontier composed by systematic risk investments. In this instance it is highly probable that the market will not reward the idiosyncratic risk: in other words, riskier bets imply worse performance. For this type of manager, the market would be comparable to participation in a game with few opportunities and expert players. Some less experienced players who assume greater risks could experience big losses and players who are losers at some point could select risky bets in order to improve their position. Thus, Brown and Goetzmann (1995) find that mid-year losers tend to increase the fund's volatility during the latter part of an annual assessment period to a greater extent compared to mid-year winners. Kempf et al. (2009) also highlight that when the fund managers' employment risk is low, the compensation incentives become more relevant; and the managers with poor mid-year performance increase risk to catch up with the mid-year winners. In summation, in a market with low idiosyncratic risk and therefore a low number of opportunities, we generally expect a low level of persistence, excluding the worst mutual funds. This is due to their risky bets: instead of beating the market or improving their ranking in the mutual fund tournament, their performance actually worsens.

3.4. Performance persistence of Islamic mutual funds

In the previous subsection we proposed a model in which performance persistence is dependant on both on the fund's markets (c_m) as well as the managers' skills ($v_{p,j,m}$). In this subsection, we address characteristics of Islamic funds that explain and influence their performance persistence.

Firstly, we consider the effects derived from the constraints which Islamic funds have on certain types of investments, as well as the contexts in which they practice these constraints. These constraints are used to screen and distinguish stocks that could be considered *Shari'ah* compliant from others. An example of

the screening criteria is how Islamic funds are restricted mainly to equity investments with leverage (debts) not exceeding a certain threshold, prescribed by the Islamic Funds' SSB and exclude investments that earn fixed income. Hoepner et al. (2011) argue that the constraints imposed on Islamic fund managers limit their ability to exploit both superior information and winning markets. On the other hand, these constraints limit the potential damage (ibid.) that can be caused by unconstrained fund managers (Abdullah et al. 2007). The theoretical models (Barber and Odean 2001) and the empirical evidence (Puetz and Ruenzi 2011) show that overconfident fund managers tend to trade excessively more than can be justified on rational grounds (Barberis and Thaler 2003). This excessiveness could potentially lead to volatility in performance if overconfident managers take bets outside the normal risk tolerances. Due to the constraints imposed on the managers of Islamic funds, it can be argued that they may be more cautious in selecting investments to be included in their portfolios, in comparison to their conventional counterparts. Moreover, trading constraints restrict their ability to exhibit the exuberant behavior of unconstrained investors, which may lead to persistence in future performance. By prohibiting speculative transactions and investments in highly leveraged firms and conventional banks, the Islamic finance industry managed to maintain minimal exposure during the global financial crisis (Ahmed 2010). We therefore as a result expect Islamic funds to show resilience during the crisis.

In this sense, Askari et al. (2010) point out how factors explaining systematic risk in conventional finance—interest rates and credit booms that create a large equity premium—are absent in Islamic finance. As a result, asset prices in Islamic finance feature a very low correlation with the market portfolio and are influenced more by idiosyncratic risk from some characteristics of the firm, such as competitiveness, cost-efficiency and investment plans. Therefore, given our theoretical approach developed from expressions (2) to (5) in subsection 3.3, we expect the evidence of persistence in Islamic funds to meet the provisions for markets with higher idiosyncratic risk and a higher number of opportunities. Accordingly, a higher level of persistence is expected from Islamic funds, not only compared to their conventional counterparts, but also in comparison to other types of constrained investments.

Secondly, with respect to the manager's skills ($v_{p,j,m}$), Islamic funds require managers with specific expertise in order to be able to deal with the investment requirements of Islamic funds. These funds require extra-financial research aimed at understanding the performance of corporations in terms of *Shari'ah* compliance rules (Derigs and Marzban 2008; Bauer et al. 2005). These requirements make it difficult to find highly specialized fund managers. Thus, shortage in expertise and alternatives for Islamic funds are likely to contribute to their performance persistence in the short-run. Any fund management company is highly likely to put maximum effort into keeping outperforming managers from moving to other companies. Khorana (2001) finds that changing the manager of an outperforming fund has a deteriorating effect on the fund's performance post-replacement and thus eliminates any evidence of performance persistence. The market conditions for the managers of Islamic funds mitigate the possibility of changing the outperforming managers due to the high retention forces. The rational for Islamic funds is to maintain the experts who have the know-how and the capabilities to manage funds efficiently. This might consequently lead to persistence in performance.

Thirdly, persistence in the Islamic funds performance may arise from investors being reluctant to switch to other funds. The higher transaction cost, asymmetric information, absence of alternative funds and lack of management expertise are factors that could drive investors to stick to their current funds, even if they are underperformers. Thus, persistence takes place. It could also be argued that investors in Islamic funds, are expected to be more loyal than their conventional counterparts (Webley et al. 2001). In addition, the nonfinancial *Shari'ah* screening criteria and hence, firm inclusion or exclusion from the portfolio[3] are less likely to change. These factors could lead to an expectation of portfolio stability, as well as performance persistence.

4. Data description

The data used in this study was taken from *Shari'ah*-compliant equity mutual funds. We analyzed 335 mutual funds classified as Islamic equity funds by Morningstar. This database provides information on the daily returns for these funds. The analyzed sample period stretches from January 1, 2000, to June 30, 2013.

The evolution of the number of funds from 2000 to 2013 is reported in Table 1. The number of funds varies over the sample period. This is due to the fact that some funds disappear and new ones are incorporated. Considering the net balance of newly born and dead mutual funds, the number generally increases. The annual increase in the number of funds has been on average 18.83% per annum. Excluding in 2010 and 2012, these funds have been quite resistant since the number of net funds has more than doubled since the beginning of the international financial crisis.

There is no survivorship bias in the results for performance and persistence because all existing funds at any time during the sample period are included in the analysis. With relation to persistence analysis, only funds that exist in the first period are considered in order to initiate the recursive portfolio approach in the algorithm described above. However, avoiding survivorship bias can also lead to other problems. Specifically, the inclusion of funds with limited data may reduce the robustness of the analysis. In this regard, Rohleder et al. (2011) point out that the measurement of an individual fund's performance requires a return history of a certain length in order to generate reliable regression estimates. In addition, comparing funds over different time periods could add some bias if the mutual fund's performance is correlated with the period for which the data is available. For instance, performance could differ depending on the economic cycle, or for bull and bear markets (Kacperczyk et al. 2009; Kosowski 2011; Sun et al. 2013). In order to avoid this type of problem, our empirical strategy takes into account the following: (i) according to the traditional mutual fund literature and to eliminate survivorship bias, we present performance and persistence results for both mutual funds and surviving funds; and (ii) we also report the results that distinguish between both groups, because they allow the analysis comparison of survivor and non-survivor funds for common periods.

Rohleder et al. (2011) analyze survivorship bias in the performance of mutual funds with respect to

[3]Unless the firm exceeds the financial ratio (such as gearing) thresholds.

four different fund groups: full-data survivors, non-full-data survivors, disappeared new funds, and disappeared initial funds. In this line, Table 2 reports five categories of mutual funds. First, we split the funds into two sets: survivors (S) and non-survivors (NS). The two sets differ due to the fact that the first set (second) includes all of the mutual funds with (without) a net asset value as of June 30, 2013. Bearing in mind the number of semesters (six month periods) for which the data for mutual funds is available, we create three subgroups for S mutual funds: $S = 27$, when the fund shows data for the whole sample period; $S \geq 4$ for survivor mutual funds with at least four semesters of data, and $S < 4$ for survivors with less than four semesters of data. Also, considering semesters with data, then non-survivor mutual funds are collated into two groups: $NS \geq 4$ is constituted by mutual funds with at least four semesters of data, and $NS < 4$ for the rest. As indicated in Table 2, only 5.67% (19/335) of the funds have complete data over the sample period (S). The largest group is $S \geq 4$ at 52.84% (177/335).

Table 3 reports the summary statistics that correspond to the characteristics of the mutual funds. With respect to the geographic area of investment, 262 out of 335, or 78.21% focus on Europe, the United States, and Canada. However, according to a mean-variance analysis, the differences among the categories analyzed are, on average, low. Differences are only notable in the average size of the funds, which is more than 50% higher in the case of the Middle East OE Equity.

As mentioned before, to evaluate the performance of the mutual funds, we apply a linear model where the funds excess returns are adjusted corresponding to the types of assets in which the funds invest in. It should be noted that the analyzed funds invest in very different geographical areas in order that the first benchmark can be a global index: the FTSE World. To represent the *Shari'ah* compliant investments, we use the DJ Islamic World. Moreover, because a significant number of funds have specific investments in the Middle East, we also use the FTSE AW Middle East & Africa. To compute the excess return we have used the one-month Treasury bill rate as the risk-free asset from Ken French's website.[4]

Table 4 reports the indexes used in model (1) for the funds in the sample. Furthermore, with regard to the summary statistics for the indexes for the analyzed sample period, the most globalized indexes (for which financial markets in more advanced economies weigh more) show a more conservative mix of average returns and risks compared to those for the emerging markets (FTSE AW Middle East&Africa), which have higher risks and, more importantly, average returns.

5. Results

5.1. Results on performance

Table 5 shows the results of the estimation of the performance of the funds obtained by applying model (1). The results are grouped by Morningstar category and the average for all of the funds is reported at the bottom. The left panel of the table indicates that for the Europe OE Islamic Equity funds, the positive (negative) abnormal performances are distributed similarly, though notably the percentage of funds that are significantly different from zero is small, 4.58% (6.49%), for the abnormal negative (positive)

[4]See `http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html`.

performance. For the Middle East OE Equity funds, the percentage of funds with positive alphas is higher. However, the proportion of funds with significantly negative abnormal performances (5.48%) is higher compared to those who obtain a positive and significant alpha (2.74%). The sum of both categories of funds shows how the number of significant alphas is very small and almost equal for those with negative and positive signs (4.78% and 5.67% respectively).

The right panel of Table 5 shows the aggregate information on the performances achieved by Islamic funds. We report that the annualized performance from the daily abnormal alpha for the Europe OE funds is –0.27% and 3.19% for the Middle East OE funds. The results for the Europe OE funds coincide with the most recent studies that calculate performance of the mutual funds as close to zero on the left. However, the Middle Eastern funds attain a relatively high average performance and, therefore, their managers seem to have the ability to add value. The value of the median is similar to the sample mean for the Europe OE funds (–0.27% vs. –0.23%), which suggests that the performance differences within this category of funds are relatively low. However, compared with the mean, the median is lower for the Middle East OE Equity funds. This indicates that the mean has shifted to the right due to the abnormal performance of some funds. The next column shows the abnormal performance of the funds normalized by size (measured by assets): a size-weighted average. This value indicates the abnormal performance obtained, on average, for every dollar invested in this group of funds. Both types of alphas for the funds increase remarkably, which suggests that the larger funds are achieving better performance compared to the smaller funds.

Furthermore, the last column of Table 5 shows performance by reporting a weighted average in which the weighting factor is the fund's lifetime. We consider this calculation important because the number of funds increases during the sample period, and the unweighted mean might be influenced by the funds with a limited lifetime. This influence may somehow distort the representativeness of the mean as a measure of abnormal performance for these particular funds. For the Europe OE Islamic Equity funds, the time-weighted alpha funds take a value of 1.65%, which shows a significant increase from the unweighted mean of –0.27%. This value implies that funds with longer lifetimes during the sample period provide some added value and that the impact of the funds with less of a lifetime, either because they have disappeared or because they are new, contribute to a negative final value for the mean. However, for the Middle East OE Equity funds, the effect is the opposite. In summary, the data in the right panel of Table 5 shows that smaller funds or those with less of a lifetime adversely affected the average abnormal performance for the Europe OE Islamic Equity funds during the sample period. In the case of the Middle East OE Equity funds, their abnormal performances are also negatively affected by smaller funds, but are positively affected by funds with less of a lifetime.

With reference to the effect of size on performance, there is clear evidence of improvement in the average abnormal performance of a fund when weighting by the fund's size. This result is evident for the entire category of Islamic funds as well as for each type of fund according to its geographical investment area. This finding implies that a certain positive relationship between performance and size exists: smaller (larger) funds show worse (better) performance. The empirical evidence on the link between performance and size is mixed, nevertheless our results are in line with Indro et al.'s (1999) approach, as well as the

empirical evidence reported by Otten and Bams (2004) and Rohleder et al. (2011) among others.

5.2. Comparing survivors' and non-survivors' performance

According to the above subsections, the performance of a fund changes when controlling for both size and lifetime. Both weighting schemes are relevant, but the literature on mutual fund performance has demonstrated that survivorship is also a relevant issue (see, for instance, the influential study by Brown et al. 1992, among other relevant contributions). Therefore, we conduct a detailed comparative analysis of the fund's performance, taking survivorship into account in Table 6. We cluster the funds, similarly to Table 2, into the five groups of funds, depending on their lifetimes in the sample period.

Table 6 compares the performance of these groups of funds. We have set the funds that survive for over four semesters ($S \geq 4$) as a threshold as it is the largest group. The table shows the difference between the performance of each group versus $S \geq 4$. The p-values corresponding to the abnormal performance differences between the groups are computed by using a bootstrap. Table 6 shows that the performances of those funds with complete data ($S = 27$) are 1.31% higher than that of the reference group—yet the difference is not significant. For the rest of the groups, the differences are negative and significant. As there could be a pattern with respect to the geographical area in which the fund invests, we also carried out an analysis that confines the comparison to funds that invest in the same geographical area. Hence, we observe that those funds that invest in the Europe OE show the same pattern, but the difference is only significant for the non-survivors. Accordingly, the non-survivor funds with more than four semesters ($NS \geq 4$) obtain an abnormal performance of –6.54% (annualized) with respect to the survivor funds ($S \geq 4$). The percentage is –11.23% for the non-survivor funds with shorter lifetimes (i.e., $NS < 4$). This finding might suggest that Islamic funds that invest in the Europe OE, as well as non-survivor funds have worse performances than the survivors. In the case of the funds that invest in the Middle East (which is the smallest group), the differences are not significant.

One could conclude that for developed markets and for groups of funds with a large number, the non-surviving funds achieve worse performances than the survivors. This evidence is similar to that concluded from other studies on conventional mutual funds, as shown by Malkiel (1995), Elton et al. (1996), Carhart et al. (2002) and Rohleder et al. (2011), among others.

5.3. Persistence

In this subsection, we assess persistence by analyzing the performance of portfolios that invest according to the past. These results are reported in Tables 7 and 8 for all of the funds, but only respectively for survivors.

We hypothesize that if there is persistence in a mutual fund's performance, the portfolio with investments based on a poor (good) past performance will show a negative (positive) abnormal performance (see Carhart 1997; Busse et al. 2010, among others). To test this hypothesis, we divide the sample period into semesters and year windows and then consider a strategy based on investing as a function of the pre-

vious semester (year's) abnormal performance, which is revised each semester (year). Firstly, we measure the abnormal performance of each fund using model (1) in the first period. Secondly, funds are ranked according to their performance and classified into deciles. Thirdly, we build equally weighted portfolios that, during the following period, invest in the mutual funds according to their previous decile classification. For instance, the first portfolio, D_1 (first decile) invests in the worst performing funds in the previous period and conversely, the last portfolio, D_{10}, invests in the previous period's best funds. This procedure was applied again at the end of each period. By following this scheme, each portfolio from D_1 to D_{10} follows an investment strategy that rebalances the selected funds according to their previous abnormal performance. Taking into account the daily return of these portfolios, we estimate their abnormal performances by following model (1). If the results are significantly positive (negative) for the first (last) deciles, then there is evidence of persistence.

The first row in each of these tables shows the values of the abnormal performances of the decile-portfolios. The second row reports the standard p-value from model (1), with the Newey-West heteroskedasticity and autocorrelation consistent covariance estimator. This standard p-value tests whether the alpha is different to zero. The p-values in the third row are cross-sectional and correspond to the critical probability estimated by means of simulations. They also test whether the alpha corresponding to the portfolio-decile is different from those achieved by following a random strategy. If there is persistence in the added value from managers, the best or worst mutual funds will repeat that ranking in the future, and a strategy based on their past performance should achieve a better performance than a random strategy that invests in funds without any criteria.

We form 5,000 synthetic equally-weighted portfolios that invest randomly in a decile of the group's funds. The daily returns of the synthetic portfolios are computed and model (1) is applied to estimate abnormal performance. Consequently, a distribution of 5,000 alphas is formed to test for the significance of the abnormal performance of following investment recommendations based on past performance. Next, for each of the portfolios based on past performance, the cross-sectional p-value is computed as the percentage of the synthetic portfolios that produce an alpha greater than the corresponding value for the portfolios that are based on past-performance. This procedure is repeated for each of the different fund categories in Tables 7 and 8. The results are also split according to the time horizon. The upper (lower) panels in each table present the results when a semester (year) window is used both to measure past persistence as well as to implement the investment strategy in the next period.

The first row of Panel A in Table 7 reports that the abnormal performance increases across the deciles. Figure 1 is its graphical counterpart and corroborates this behavior. This pattern is less clear for the portfolios in the central deciles. The cross-sectional p-values for these portfolios point out that abnormal performance is not significantly different from that obtained randomly. The standard p-value indicates that the performance is only different from zero for significance levels between 5% and 10% for the portfolios D_8, D_9 and D_{10}. The cross-sectional p-values indicate that the performances are significantly different from those achieved by following a random strategy. For these portfolios the annualized abnormal performances are 4.70%, 7.88%, and 8.68%, respectively. These percentages reflect the persistence in performance for the

best funds, which implies that managers are capable of providing added value to the funds managed persistently over time. This result is in line with the results obtained in other studies, such as Lynch and Musto (2003), Cohen et al. (2005) and Kosowski et al. (2006), which find persistence among winners. Such evidence is relevant to the extent that the investor should select the best funds from the past in order to obtain good future performance.

Panel B of Table 7 reports the results for all of the funds in the sample when the investment strategy follows the past performance in a yearly window. In this case, the evidence of persistence is weaker. Similarly, in Panel A, the persistence in the portfolios of higher deciles increases in Panel B; however, it is less clearly visible for the other deciles. In fact, the corresponding line in Figure 1 shows positive trends only for the higher deciles. In reality, the standard and cross-sectional p-values in this panel show that the abnormal performances of the decile-portfolios are not significant. This is excluding that of D_{10}, which reaches an annualized value of 9.25%. Comparing the results in Panels A and B in Table 7, the higher persistence in the upper panel is due to a short-term phenomenon. This result is in line with the previous findings in the financial literature, such as those of Deaves (2004) and Bollen and Busse (2005).

Table 8 shows the results for persistence when only survivor funds with at least four semesters in the sample period are considered (those named $S = 27$ and $S \geq 4$ in Table 2). These funds are considered more stable. When a semester window is used (Panel A), the increased persistence is not as clear as in Table 7—especially for the portfolios in the lower deciles. For D_8, D_9, and D_{10}, the abnormal performances are 6.51%, 11.73%, and 7.81%, respectively. Only the first two are significant. Panel B of Table 8 shows the results when the window is yearly. Similar to Table 7, the yearly window shows evidence of weaker persistence with an abnormal performance of only 9.40% for D_{10}, which is close to the 10% significance level.

To put it briefly, when analyzing performance persistence, we find a tendency indicating that investing in funds with worse (better) past performance results in worse (better) future performance, as shown in Figure 1. In subsection 3.3 we proposed that it made more sense to expect a higher level of persistence in Islamic funds than in their conventional or SRI counterparts. This is because the Islamic funds invest in markets with higher idiosyncratic risk, a higher number of opportunities, and higher stability. In this sense, persistence is only significant in the case of the best Islamic funds, especially in the semester window. Therefore, the skilled managers of those funds are able to select winning bets in a market with potential for success. For non-surviving funds with shorter lifetimes, we observe that the results are not substantially changed. However, the evidence of persistence is slightly worse when they are not taken into account. The last result is coincidental with the evidence reported by Carhart et al. (2002), who find that controlling for survivorship weakens the evidence of persistence.

6. Conclusions

The literature on the performance persistence of mutual funds is now well established. However, it remains inconclusive with respect to answering the question as to whether some mutual fund managers possess

significant abilities that persist over time. In this study we have analyzed the performance persistence of Islamic funds, which are a particular type of morally based funds. Despite their growing importance, the attention that the finance literature has given to them is low. Islamic funds' growth has not only been remarkable but also represents unique screening particularities.

Taking these premises into consideration, the paper has two aims. Our first aim is substantive in that we aim to conduct an analysis of performance persistence in Islamic funds for the 2000 to 2013 period. As indicated above, the issue as to whether it is possible to predict future performances based on past results is still virtually unexplored for this type of investment. Our second aim is methodological in that we consider a different procedure for measuring performance persistence of mutual funds compared to those in the literature. Specifically, we design an algorithm based on the recursive investment portfolio approach initially proposed by Carhart (1997). We refine this approach by proposing an alternative algorithm to ascertain whether or not the abnormal performance results from a dynamic investment strategy based on past returns. In addition, persistence is calculated for two windows of time—semester and yearly. The results are reported for both surviving and non-surviving funds.

Although our general findings indicate that persistence exists, the results are subject to several subtleties. In general, the past returns are important for this type of investment, particularly for the highest deciles, which represent the best funds, whereas for the worst funds, the results are not significant. In addition, our results show that both the time horizon considered and the survivorship bias are factors that impact persistence and hence must be controlled for (persistence weakens when non-surviving funds are not taken into account). Our results support the previous evidence found on the role of nonfinancial attributes when evaluating fund performance. In addition, the results highlight the importance of examining the various categories of ethical/morally based funds separately. Our findings provide evidence which supports the argument that different screening processes might generate value-relevant information for investors, which as indicated by Renneboog et al. (2011), would not be available otherwise.

Our results show that despite the disruption of the 2007–2008 financial crisis, these type of investments were able to maintain their growth in numbers at an average of 16.65% per annum in the 2008 to 2013 period. This provides empirical evidence that supports the view of Askari et al. (2010) who argue that Islamic banking and finance are more resilient in times of crisis. This evidence could be explained by the prohibition against speculative transactions and investments in highly leveraged firms and conventional banks. Thus, Islamic funds managed to maintain minimal exposure and suffered less during the 2008 global financial crisis (Ahmed 2010). In addition to the resilience during the crisis, our results show persistence in the performance of Islamic funds. This finding could be due to many factors, including the constrained investment horizon and the specialist managerial skills needed for these funds, in addition to the lack of alternative funds and the loyalty of their investors. Our results have implications for international investors, practitioners, and researchers in considering the impact of the unique characteristics of this class of ethical funds.

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Table 1: Evolution of the number of Islamic funds, 2000–2013

Year	Islamic	
	Number of funds	% change
2000	30	–
2001	34	13.33
2002	40	17.65
2003	49	22.50
2004	57	16.33
2005	72	26.32
2006	84	16.67
2007	111	32.14
2008	147	32.43
2009	191	29.93
2010	201	5.24
2011	227	12.94
2012	215	–5.29
2013	268	24.65
Mean % change 2000–2013	–	18.83
Mean % change 2000–2008	–	22.17
Mean % change 2008–2013	–	16.65

Table 2: Survival characteristics of mutual funds in the sample

Type of fund	Morningstar Category	$S = 27$	$S \geq 4$	$S < 4$	$NS \geq 4$	$NS < 4$	Total
Islamic	Europe OE Islamic Equity[a]	12	137	37	53	23	262
	Middle East OE Equity[b]	7	40	0	16	10	73
	Total	19	177	37	69	33	335

[a] Europe OE Islamic Equity comprises: (i) Europe OE Islamic Asia Pacific Equity, (ii) Europe OE Islamic Equity - Other, (iii) Europe OE Islamic Global Equity, and (iv) Europe OE Islamic Malaysia Equity.

[b] Middle East OE Equity comprises: (i) Middle East OE GCC Islamic Equity, (ii) Middle East OE Global Islamic Equity, (iii) Middle East OE Kuwait Islamic Equity, and (iv) Middle East OE Saudi Islamic Equity.

$S = 27$: Total survivors (present in the 27 semesters sample).

$S \geq 4$: Mature survivors (present in at least four semesters (it has value for semester 27, i.e., it is alive as of 30/06/2013).

$S < 4$: New survivors present in less than four semesters (it has value for semester 27, i.e. it is alive as of 30/06/2013).

$NS \geq 4$: Not survivors in at least four semesters (it has no value for semester 27, i.e. it is not alive as of 30/06/2013).

$NS < 4$: Not survivors in less than four semesters (it has no value for semester 27, i.e., it is not alive as of 30/06/2013).

Table 3: Mutual fund summary statistics, 2000–2013

Type of fund	Morningstar category	Number of funds	Average annualized net return	Average annualized s.d.	Average size[a]
Islamic	Europe OE Islamic Equity	262	4.51%	18.36%	44,963,318.70
	Middle East OE Equity	73	4.60%	19.69%	69,541,837.43
	Total	335	4.53%	18.65%	49,002,445.90

[a] Size (assets) in USD.

Table 4: Summary statistics for the benchmarks

Type of fund	Factors	Average annualized net return	Average annualized s.d.
Islamic	FTSE World	4.48%	17.69%
	DJ Islamic World	3.11%	18.21%
	FTSE AW Middle East&Africa	13.49%	23.46%

Table 5: Performance, Islamic funds

Type of fund	Morningstar category	Percentage of total number of funds in group					Annualized performance			
		Number of funds	< 0	p-value ≤ 0.05	> 0	p-value ≥ 0.05	Mean (unweighted average)	Median	Weighted average (by fund size)	Weighted average (by fund life)
Islamic	Europe OE Islamic Equity	262	51.15%	4.58%	48.85%	6.49%	–0.27%	–0.23%	2.44%	1.65%
	Middle East OE Equity	73	34.25%	5.48%	65.75%	2.74%	3.19%	2.11%	6.05%	2.03%
	All funds, Islamic	335	47.46%	4.78%	52.54%	5.67%	0.49%	0.35%	3.28%	1.76%

Table 6: Comparative performance of survivor vs. non-survivor funds, Islamic funds

Comparison	All funds		Europe OE Islamic Equity		Middle East OE Equity	
	Difference	p-value	Difference	p-value	Difference	p-value
$S = 27 - S \geq 4$	1.31%	0.293	0.63%	0.366	2.12%	0.363
$S < 4 - S \geq 4$	–3.85%	0.022	–1.48%	0.164	–	–
$NS \geq 4 - S \geq 4$	–6.54%	0.000	–6.34%	0.000	–2.33%	0.347
$NS < 4 - S \geq 4$	–8.22%	0.000	–11.23%	0.000	0.97%	0.420

For interpretation of $S = 27$, $S \geq 4$, $S < 4$, $NS \geq 4$ and $NS < 4$ see Table 2.

Table 7: Persistence analysis, Islamic funds, all

PANEL A: Semester										
	Decile:									
	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9	D_{10}
Annualized constant (%)	–4.73	–2.42	–1.48	1.09	1.43	0.69	0.45	4.70	7.88	8.68
Standard p-value	0.204	0.455	0.607	0.675	0.57	0.795	0.874	0.082	0.046	0.077
Cross-sectional p-value	0.000	0.006	0.024	0.623	0.538	0.712	0.761	0.025	0.000	0.000
PANEL B: Yearly										
	Decile:									
	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9	D_{10}
Annualized constant (%)	1.96	0.47	–1.16	1.29	3.04	1.45	4.95	5.39	5.29	9.25
Standard p-value	0.628	0.869	0.668	0.652	0.209	0.556	0.083	0.069	0.125	0.084
Cross-sectional p-value	0.746	0.931	0.009	0.850	0.525	0.827	0.170	0.121	0.130	0.001

Table 8: Persistence analysis, Islamic funds, survivors[a]

	Decile:									
PANEL A: Semester	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9	D_{10}
Annualized constant (%)	–1.69	–3.60	1.72	1.95	5.40	2.56	3.74	6.51	11.73	7.81
Standard *p*-value	0.664	0.213	0.564	0.496	0.052	0.404	0.216	0.039	0.008	0.124
Cross-sectional *p*-value	0.006	0.000	0.806	0.775	0.192	0.685	0.460	0.085	0.000	0.026
PANEL B: Yearly										
	Decile:									
	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9	D_{10}
Annualized constant (%)	2.44	6.58	6.02	0.76	2.61	5.54	5.63	6.50	7.83	9.40
Standard *p*-value	0.549	0.044	0.057	0.769	0.347	0.063	0.057	0.045	0.042	0.103
Cross-sectional *p*-value	0.872	0.266	0.350	0.964	0.859	0.430	0.413	0.280	0.127	0.040

[a] Surviving funds at the end of the sample period, with data for at least four semesters (funds $S = 27$ and $S \geq 4$ in Table 1).

Figure 1: Performance persistence, Islamic funds