THE INVESTMENT PERFORMANCE OF US ISLAMIC MUTUAL FUNDS

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Abstract

Islamic investment funds have become increasingly important due to a high level of demand from many investors – and not just Muslim investors. This article examines the performance and risk sensitivity of Islamic mutual funds in the US in comparison with their conventional peers. There is also an analysis and comparison of the performance of Islamic funds in relation to socially responsible investment (SRI) mutual funds. A CAPM-based methodology is applied for this analysis. Results suggest that for the whole period of the study (1987-2018), Islamic funds performed better than conventional funds with comparable characteristics. However, during the most recent period (2000-2018), there was no significant difference in performance. Moreover, Islamic funds produced adjusted performances that did not significantly differ from SRI funds. Conversely, for the period 1987-2000, Islamic funds did not perform as well as SRI and conventional funds with similar characteristics.

Keywords Islamic mutual funds; socially responsible investments; ethical investing; performance evaluation; risk adjusted performance.

1. Introduction

Muslims represented 23% of the world population in 2016. Islam is the second largest religion in the world after Christianity (CIA, 2016). According to the Pew Research Center (2017), by the year 2035, Islam will become the largest religion in the world. Hassan (2002) estimated that the amount of millions invested by Muslims are growing 15% annually. However, only a small part of the available funds are invested in Islamic products, which indicates that this market is not yet fully exploited.

Islamic banking and finance are based on Sharia principles, which forbid payment or receipt of *riba*, generally misconstrued as interest (Pryor, 2007). These principles have their origin in Islamic law (Sharia) arising from the Quran and Sunnah (Franzoni and Ait Allali, 2018). Every institution and mechanism used within Islamic finance applies the Sharia and its prohibitions and principles are established in the Quran – the main principle being to care for the welfare of the people. A sizeable body of academic finance literature has documented Islamic investment guidelines (see El-Gamal, 2000; Hassan, 2002; and Hassan, 2010 or Ibrahim *et al*., 2009).

Islamic finance is one of the fastest growing industries in the number of transactions and the development of new products and markets. The finance systems of the majority of Islamic countries date from the period of European colonial expansion in the nineteenth century – and therefore most of these countries adopted the conventional system that has lasted to this day (Wilson, 1997).

A definitive expansion of the Islamic banking system took place in the 1990s. This was a consequence of petrodollar revenues in the Persian Gulf. Business diversification produced new banks and sophisticated new products which were imitated in other countries (Wigglesworth, 2013).

Islamic investment is included in what has been called socially responsible investment (SRI). According to the Forum for Sustainable and Responsible Investment, 'sustainable, responsible and impact investing (SRI) is an investment discipline that considers environmental, social, and corporate governance (ESG) criteria to generate long-term competitive financial returns and positive societal impact'. SRI integrates financial, social, environmental, and/or ethical criteria into the processes of analysis, selection, and choice of investment (SIF, 2017).

According to the Social Investment Forum, sustainable, responsible, and impact investments enjoyed a growth rate of more than 33 percent between 2014 and 2016, increasing from $6.57 trillion in 2014 to $8.72 trillion. More than one out of every five dollars under professional management in the United States was invested according to SRI strategies.

Islamic principles mandate that trading must be free of ambiguity. These principles prohibit selling something that is not owned or cannot be described in accurate detail in terms of type, size, and amount (El-Gamal, 2000). Thus, the trading of futures, warrants, options, as well as short-selling and anything speculative, is forbidden. Also prohibited are investments in non-productive and/or potentially harmful activities such as gambling and prostitution (El-Gamal, 2000). The production and/or distribution of products such as alcohol, tobacco, pork, pornography, and arms are also prohibited (Hassan, 2002). It is

permissible to invest in companies with gross interest-bearing debt below 33% of total assets. Similarly, it is permissible to invest in companies with interest income that is less than 5% of the total. Accounts receivables and cash accounts may not exceed 50% of total asset revenues (Ibrahim *et al*., 2009).

Franzoni and Ait Allali (2018) show that there are five fundamental 'pillars' that oversee the regulation and religious validity (sharia compliance) of any Islamic economic and financial activity: no interest charging (ribà); no speculating (maysìr) and introducing elements of uncertainty in contracts (ghàrar); no trade and investment in prohibited assets or activities (haram); application of profit and loss sharing principles; and the obligation to have real assets underlying all financial transactions.

Girard and Hassan (2010) classified Sharia laws into three main rules that govern Islamic mutual fund creation: asset allocation; investment and trading practices; and income distribution (purification). Asset allocation refers to what assets may be included in the portfolio. Islamic fund managers cannot invest in money markets (because of the risk-free investments), but they can invest in the Islamic bond market (sukuk market). Similarly, investing in the securities of financial institutions where interest is a major source of income (such as banks) is prohibited (Abdullah, *et al*., 2007).

The real beginning of Islamic mutual funds was in the mid-80s. The first US Islamic equity fund established was launched in June 1986 by members of the North American Islamic Trust (NAIT) based in Indiana (Lewis and Algaoud, 2001).

Fundamentally different from conventional funds, Islamic mutual funds are managed under strict guidelines to comply with Islamic principles. The compliance of funds is

ensured by a committee known as the 'Sharia board'. The main difference between Islamic funds and conventional funds is that managers have a smaller universe of companies to invest in, as they are subject to the screening out of businesses that are not Sharia compliant. Previous literature has found that the Islamic finance system has performed better than its conventional counterpart in bearish financial crisis periods (see Abdullah *et al*., 2007; Mansor and Bhatti, 2009 or Hayat and Kraeussl, 2011).

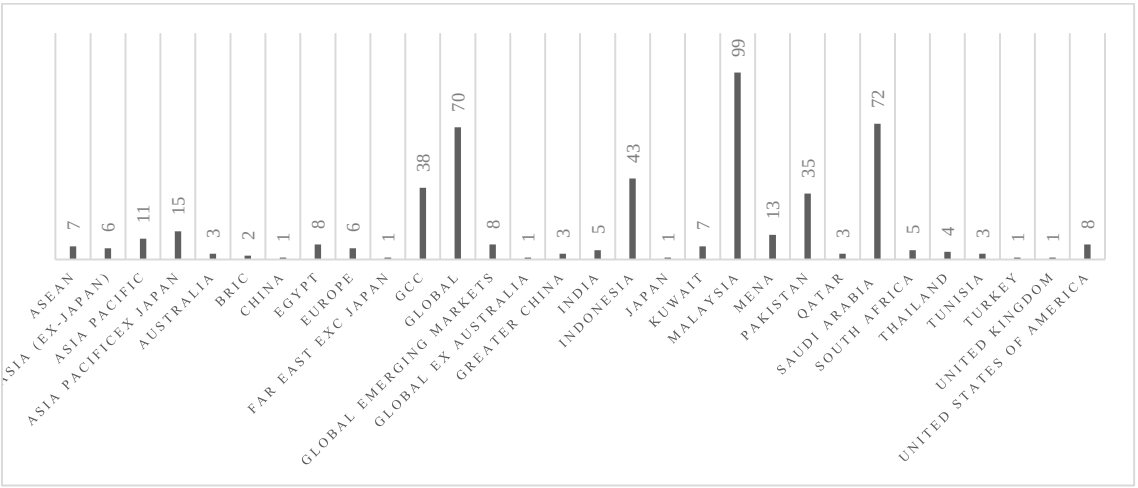
In some countries, Islamic mutual funds have been around for less than a couple of decades and are still in their infancy. Recent decades have witnessed a rapid growth in the Islamic banking and finance market – and it has become one of the fastest growing niches in global finance. Academic research on Islamic mutual funds, however, is still limited.

Islamic funds can be classified into three broad categories: debt funds; equity funds; and hedge funds. Since the mid-90s, Islamic mutual funds have received an important level of academic scrutiny. Various benchmarks have been used to assess the performance of Islamic mutual funds. For instance, researchers have used Islamic indices (Muhammad and Mokhtar, 2008; Ferdian and Dewi, 2012), conventional indices (Mansor and Bhatti, 2011), Islamic and conventional indices (Elfakhani *et al*., 2005; Hayat, 2006; Haddad *et al*., 2009), and matched-pair conventional funds (Abderrezak, 2008). Hence, some researchers find that Islamic mutual funds perform better during recessions (Abdullah *et al*., 2007), while Hayat and Kraeussl (2011) documented that Islamic funds underperformed significantly during the last financial crisis. During expansion periods, Mansor and Bhatti (2011) found mixed results. They studied two bullish periods and found that Islamic funds over-performed their benchmarks during the first period but under-performed during the second.

In general, mutual funds are an ideal choice for small investors seeking liquidity, portfolio diversification, and investment expertise. According to the ICI (2018), total net assets of US regulated open-end funds (regulated open-end funds include mutual funds, exchange-traded funds (ETFs), and institutional funds) were $22.1 trillion in 2017. The majority of US-registered investment company total net assets are mutual funds ($18.7 trillion).

A general overview of the Islamic mutual fund industry can be obtained from the Thomson Reuters Islamic funds database. In May 2018, there were 480 Islamic investment funds in this database, showing the following geographical focus:

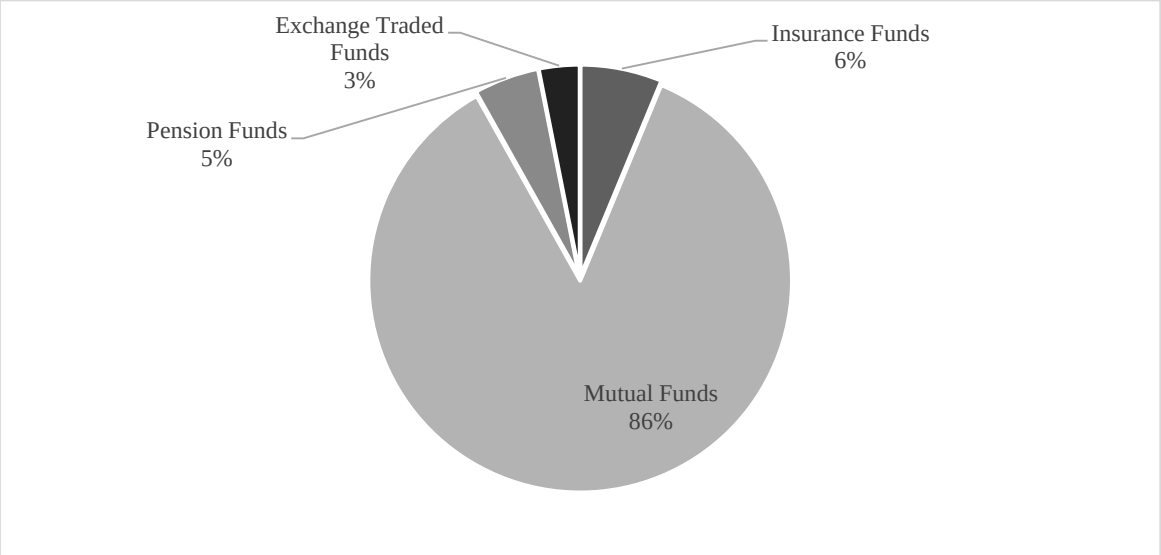
Figure 1: Number of funds and geographical focus



Source: By the authors based on Thomson Reuters. (May, 2018)

Malaysia and Saudi Arabia are the most popular investment destinations, followed by Global and Indonesia. One explanation may be that Muslims represent most of the population in Malaysia and Saudi Arabia.

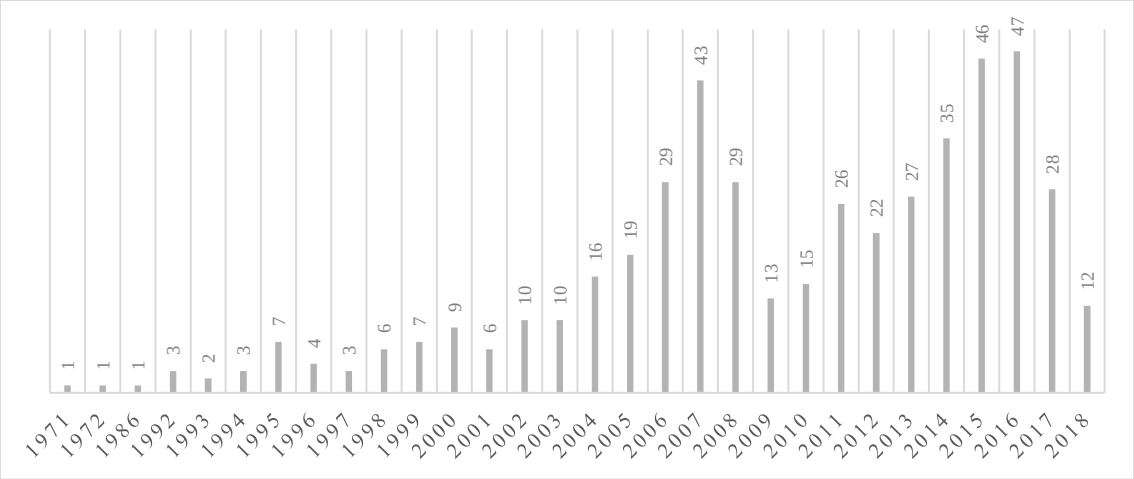
Figure 2: Distribution of asset universe of Islamic funds (%)



Source: By the authors based on Thomson Reuters. (May, 2018)

Figure 2 shows that 86% of active Islamic investment funds from this database have the structure of mutual investment funds, whereas the rest are structured with alternative formulae and other structured products.

Figure 3: Number of new worldwide Islamic funds launched each year



Source: By the authors based on Thomson Reuters. (May, 2018)

The number of new active Islamic investment funds in this database has been growing since 1971 – and 2015 and 2016 were the peak years when a total of 46 and 47 new Islamic investment funds were launched, respectively. The expansion of Islamic investment funds has been very strong in recent years.

Islamic funds predominate more in some countries than in others. But they have a significant presence in the most important economies of the world. Islamic finance is gaining importance in the United States (US). This is related to the beginning of the last crisis, when the need for credit increased in many sectors of the economy. In the United States, there are several credit companies fully adapted to Sharia law. They offer mortgages, deposits, and Islamic investment funds.

The main objective of this study is to analyse the investment performance of Islamic US mutual funds when compared to other SRI or conventional mutual funds. Is it worth investing in these types of funds? Can we pursue faith and profitability at the same time?

As far as we know, this is the first paper to analyse Islamic, SRI, and conventional mutual fund performance in the US using a matched-pair analysis. The current paper extends previous research in a number of ways. Firstly, it focuses on Islamic funds rather than more general SRI funds. Secondly, it compares their performance with both conventional funds and SRI funds through a matched-pair analysis. Finally, we focus on US mutual fund data for the 1987-2018 period. This includes recent decades during which socially responsible investing thrived in the US and grew more quickly than the broader universe of all investment assets under professional management. The results show that investing in Islamic funds might not come at the cost of reduced performance.

The remainder of this article is organised as follows. In Section 2 we give an overview of previous studies. In Section 3 we describe the mutual fund dataset used in the analysis. Section 4 discusses the empirical methodology used to measure and compare mutual fund performance. Section 5 contains the empirical results, and in Section 6 we make some concluding remarks.

2. Literature Review

The performance of mutual funds has been extensively researched. Different researchers have used varying models to evaluate the performance of mutual funds. However, very few studies have compared Islamic funds with conventional or SRI funds. This study fills this gap and compares Islamic, SRI, and conventional funds using various evaluation models.

There is little academic research on Islamic investments. In the 1990s the concept of Islamic mutual funds was launched and one of the initial studies on Islamic mutual funds were conducted by Annuar *et al*. (1997). They evaluated 31 Malaysian mutual funds by using the Treynor and Mazuy (1966) model for the period 1990-1995. It was concluded that Malaysian mutual funds outperformed their benchmarks – but the market timing was poor. The empirical literature is dominated by works that compare the risk and return features of Islamic mutual funds with various benchmarks (including conventional and Islamic market indexes, as well as portfolios of conventional bonds). For instance, Hakim and Rashidian (2004) focus on indices, and find that the application of Islamic filters

creates an Islamic index that has a peculiar risk and return profile that is unaffected by the market as a whole.

Empirical studies, such as Elfakhani *et al.* (2004), Elfakhani *et al.* (2005), Hayat (2006), Abderrezak (2008), Haddad *et al.* (2009), and Hoepner (2011) find no difference in the performance of Islamic funds when compared with conventional funds. There is little evidence that Islamic funds perform worse. Ferdian and Dewi (2007) and Mansor and Bhatti (2011) even find that Islamic funds perform better. Several studies combine efficiency analysis with analysis of fund returns. For instance, Saad *et al.* (2010) find that some Islamic funds are more efficient than conventional counterparts. Elfakhani *et al.* (2005) checked the performance of Islamic mutual fund for the period 1997 to 2002 and concluded that there was no statistical difference in the performance of the mutual funds when compared to their respective indices – and that the performance of Islamic mutual funds was improving with time as fund managers gained experience. However, the possibility exists that the results could be biased due to the short time frame in which the study was conducted.

Over the past two decades, some types of mutual funds have grown exponentially. This includes socially responsible investment (SRI) and faith-based mutual funds that have paralleled the growth in business ethics literature. These funds use techniques that combine financial objectives by investors with commitments to social and/or religious concerns (Haigh and Hazelton, 2004).

On the subject of SRI investment, Hamilton *et al.* (1993) tried to answer an important question: could we do well while doing good? If the expected returns on ethical portfolios are equal to expected returns on conventional portfolios, then social responsibility is not

priced. However, if the expected returns on ethical portfolios are lower than the expected returns on conventional portfolios, the market prices the characteristic of social responsibility. Finally, if the expected returns on ethical portfolios are higher than the expected returns on conventional portfolios, this would imply 'doing well while doing good'.

Some studies related to SRI analyse its financial efficiency through different performance measures when compared to other financial alternatives. In general, these studies reach the conclusion that SRI efficiency is very similar to that of other types of investment[1].

Previous works compared the performance of funds with SRI and general indexes (see White, 1995). In the work of Mallin *et al.* (1995), a matched pair approach is introduced by matching ethical and conventional funds by age and size. Their results show a statistically insignificant difference when evaluating the performance of ethical and conventional funds in the UK during the years 1986–1993.

Islamic investors aiming to make principled investments will probably invest in Islamic funds whatever the returns. As Statman (2000) remarks, 'socially responsible investors want to do well, not merely do good'. These investors look for responsible funds that offer a risk/return that resembles conventional funds. This study investigates whether a long-run premium or penalty exists for holding Islamic mutual funds. Statman (2000) concludes that the difference in performance is statistically insignificant when comparing the performance of socially responsible mutual funds in the US with a size-matched sample of conventional funds for the years 1990–1998.

As in the case of Islamic funds, most US SRI fund researchers have found similar performances for SRI and conventional funds (see Renneboog *et al.* (2008) for an in-depth review). Nevertheless, some researchers have found that socially responsible investments may out-perform similar conventional funds (see Gil-Bazo *et al.* (2010) on Spanish and US mutual funds).

A couple of studies combine efficiency analysis with an analysis of SRI fund returns with Islamic and conventional funds. For instance, Chang and Witte (2010) compare the average annual returns of US SRI and conventional funds over a 3, 5, 15, and 19-year period ending in March 2008. They report a significant underperformance of SRI funds over the 5, 10, and 15-year period – and the results over the 3-year period are not significant. Again, the time period seems to influence the observed results. The literature has previously compared SRI and conventional funds, or Islamic versus conventional funds, but there is sparse literature on the comparative performance of SRI versus Islamic funds. Abdelsalam *et al.* (2014) point out that no other research had been carried out in that domain before their study. This study uses a sample of 138 Islamic funds and 636 socially responsible funds for the period between 1989 and 2011. The analysis proceeds in two stages. Firstly, the performance of the two categories of funds is measured using partial frontier methods. Secondly, quantile regression techniques are used. The study concludes that the average efficiency of socially responsible (SRI) funds is slightly higher than that of Islamic funds.

As far as we know, Reddy *et al.* (2017) is the only other paper that compares Islamic, SRI, and conventional funds. Their findings demonstrate that Islamic and SRI funds generally performed at a similar level to the conventional funds. However, their study is made on UK funds, funds are only matched on size criteria, they do not study the

statistical significance of the differences in performance, and their study is made only from 2004 to 2014.

Finally, a summary of the most important literature mentioned in this work on the main topic, Islamic investment funds, together with some literature on SRI funds can be found in Merdad *et al.* (2010) and Abedifar *et al.* (2014).

3. Data

We evaluate Islamic fund performance relative to matched samples of SRI and conventional funds. Similar to Derwall and Koedijk (2009), each Islamic mutual fund is matched against an equally weighted portfolio of four conventional funds using fund age, end-of-period fund size, and investment objective as matching criteria. Likewise, each SRI mutual fund is matched against an equally weighted portfolio of two SRI funds using fund age and end-of-period fund size as matching criteria. We are less restrictive and use fewer funds in this case because the total population of SRI funds is smaller. In using these criteria, we control for the potentially interfering influence of fund age, fund size, and investment scope, respectively. We select four (two) funds to compose the matched sample of conventional funds (instead of one fund) in order to mitigate the problem that mutual funds are not entirely equal in terms of the size criterion.

This discrepancy averages out. The monthly fund data are primarily from the Thomson Reuters Eikon database and cover the period June 1987-February 2018.

Mutual fund data

Our sample consists of US Islamic, SRI, and conventional mutual funds with only open-ended equity orientation. Therefore, bond, balanced, and guaranteed funds are not included. Sample index funds, institutional funds, and funds less than 12-months old are also excluded. Equity funds are defined as funds investing at least 80 percent in equities.

When calculating returns, consistency is easier to obtain when only using open-ended funds. A screening process on the Thomson Reuters Eikon whole universe of funds has been made based on the country of domicile (US), the objective of the fund (equity), type of fund (open-ended), type of open-ended fund (mutual), and general attributes (conventional, SRI, or Islamic). We only include domestic US funds.

The main source of data is the Thomson Reuters Eikon mutual fund database. Monthly information on returns and other fund characteristics are obtained from there. Following Statman (2000), we included only the first-established class fund. We chose the class fund with the most assets if two or more class funds were established simultaneously.

At the end of the sample period, there are five US open-ended funds, classified as Islamic funds and all are more than one-year-old. These funds are: Allied Asset Advisors Iman, Amana Developing World, Amana Growth, Amana Income, and Azzad Ethical. The total funds classified as socially responsible investments are 184. Only 158 of the funds are more than one-year-old and so only those are included in the final sample.

We will now analyse the general characteristics of the total sample of Thompson Reuters Eikon's US open-ended equity funds. SRI funds are typically the smallest ($495 million),

Islamic funds follow next with $650 million, and then conventional funds with $2170 million.

The expense ratio is highest for Islamic funds (1.18), then conventional funds (0.95), and SRI funds (0.83). Moreover, for the average age of the funds (that is, the number of years the fund is operating) the characteristics are similar: Islamic funds 19.9; SRI 11.14; conventional funds 14.57.

To explain possible differences in returns between Islamic mutual funds and SRI and conventional funds, we made a comparison of the return on Islamic funds with a matched sample of SRI and conventional funds using fund age, size, and investment objective as the matching criteria. For each Islamic fund we created a matched sample with four (two) appropriate conventional (SRI) funds. The concluding sample of actively managed, retail, US, equity mutual funds in the 1987-2018 period contains a total of 5 Islamic funds, 10 matched SRI funds, and 20 matched conventional funds. We then calculated the equal-weighted returns for funds in the matched samples.

Table I shows the summary statistics for the matched mutual fund portfolio. Over the whole sample period, the average Islamic fund earned a larger average annualised return than its conventional counterpart: 4.66% vs 3.65%. Standard deviations (14.11% and 13.58%) suggest that Islamic funds were also riskier.

The average return on the Islamic portfolio was higher for this specific sample period (4.66%) compared to the average SRI fund return (4.05%), but the return variability was noticeably lower (14.11% vs 15.62%).

TABLE I

Summary statistics on Islamic versus matched SRI and conventional funds 1987–2018

Portfolio	Return (%)	SD (%)	Nº. of funds
Islamic	4.66	14.11	5
SRI	4.05	15.62	10
Conventional	3.65	13.58	20

This table reports summary statistics on Islamic, SRI, and conventional mutual funds in the sample. Islamic, SRI, and conventional fund returns are calculated based on an equally weighted portfolio of all funds. Mean return and corresponding standard deviation are presented on an annualised basis.

As the data set includes the 2008 financial crisis, it may be useful to make some comments on the impact of this crisis. During 2008-2009, Islamic funds had an average negative return of -7.19%. Equally, SRI and conventional funds fell by -9.56% and -11.97% respectively. Nevertheless, if we examine this average drop in returns by years, Islamic funds came from positive returns during 2007 (6.04%), had sharp losses in 2008 (-45.22%), and a notable year in 2009 (29.17%) that recuperated some of the negative returns from 2008. Compared with SRI and conventional returns for 2008 (-46.65% and -53.52%, respectively), we can conclude that Islamic funds coped better with the crisis. The explanation for this could be that increasing numbers of investors see Islamic funds as an alternative.

Factor benchmarks

Stock market performance in the US is measured relative to the Fama and French database US value-weighted portfolio, the MSCI USA, the MSCI KLD 400 Social Index

(KLD400), and the MSCI USA Islamic Index. We use MSCI indexes in all cases for comparability.

In May 1990, KLD launched the KLD400 index, a float-adjusted, market capitalisation weighted, common stock index of US equities. The KLD400 (previously known as KLD's Domini 400 Social Index) is the first benchmark index to employ environmental, social, and governance factors. It is a generally accepted benchmark for assessing the effect of applying social and environmental filters on investment portfolios.

Similarly, the MSCI USA Islamic Index reflects Sharia investment principles and is designed to measure the performance of large and mid-cap segments of the US market that are relevant for Islamic investors. In order to estimate Carhart (1997) multifactor models we need factor portfolios using all the US stocks in the Fama and French database. These factors are: (1) excess market return; (2) return spread between a small cap portfolio and a large cap portfolio; (3) difference in return between a value stock portfolio and a growth stock portfolio; and (4) a momentum factor. These US factors are also obtained from the Fama and French database.

4. Methodology

To make an estimate of the performance differences between funds, previous studies compared the means of groups or used matched-pair analysis. We have used the matched-pair approach. To examine whether investors must pay a price for Islamic fund strategies, we study the risk and return characteristics of Islamic mutual funds and make a comparison with reference groups of SRI and conventional funds.

We review the performance of Islamic, SRI, and conventional funds using the time-series returns produced by equally weighted portfolios of funds. We measure the performance of the fund portfolios from the perspective of a local US investor. Portfolios of mutual funds are in dollars and they are measured against US benchmark factors using local risk-free interest rates.

Risk-adjusted returns are the most appropriate yardstick for assessing investment alternatives. The literature has proposed various performance measures, but the most successful have been the Treynor (1965), Sharpe (1966), and Jensen (1968) measures.

Jensen's alpha measures a fund's outperformance through the difference between the return on the mutual fund and the return on the single-factor benchmark according to an estimated CAPM.

The following 1-factor model (CAPM) is estimated:

$$r_t - r_{f,t} = \alpha + \beta_{MKT}(r_t^m - r_{f,t}) + \eta_t \quad (1)$$

where r_t is the return on an equally weighted portfolio of funds in month t, $r_{f,t}$ is the return on a local risk-free deposit, $r_t^m$is the return of a local market proxy, α is the 1-factor-adjusted return of the portfolio, β_{MKT} measures the portfolio's market-risk exposure, and η_t stands for the idiosyncratic return.

Nevertheless, it is often claimed that this 1-factor model is unable to explain the cross-section of expected returns.

Most recent empirical studies have employed extended versions of this model. Following Climent and Soriano (2011), we use the Carhart (1997) four-factor model[2] that has its basis in the Fama and French extension of the CAPM model – but includes an additional factor that captures the momentum strategy.

Apparently, the four-factor model explains the cross-sectional variations in returns better than the CAPM (Bauer *et al.* 2005) and has a lower pricing error than both the CAPM and the Fama and French models (Carhart, 1997). The model is also linear in its parameters.

Therefore, we estimate a four-factor model that includes the market (MKT), size (SMB), book-to-market (HML), and momentum (MOM) factors (see Carhart, 1997; Fama and French, 1993) to control for the impact of investment styles on performance:

$$r_t - r_{f,t} = \alpha + \beta_{MKT}(r_t^m - r_{f,t}) + \beta_{SMB} r_t^{smb} + \beta_{HML} r_t^{hml} + \beta_{MOM} r_t^{mom} + \eta_t \quad (2)$$

where r_t is the return on an equally weighted portfolio of funds in month t, $r_{f,t}$ is the return on a local risk-free deposit, $r_t^m$is the return of a local market proxy, $r_t^{SMB}, r_t^{HML}, r_t^{MOM}$are the SMB, HML, and MOM factors, α is the four-factor-adjusted return of the portfolio, $\beta_{MKT}, \beta_{SMB}, \beta_{HML}$ are β_{MOM} are the factor loadings on the four factors, and η_t stands for the idiosyncratic return.

When estimating the model, we obtain estimates for betas and alpha. The betas show the sensitivity of the dependent variable against the specific factor, holding the other variables constant. A factor portfolio is a portfolio consisting of stocks that are highly sensitive (a

beta of 1) to one factor and relatively insensitive (a beta of 0) to other factors. The returns of the factor portfolios respond to changes in that specific factor – but are uncorrelated with other factors. The monthly return data for all factor portfolios are collected from the Fama and French website, which provides data for the US market.

5. Empirical Results

The results of using Equation (1) are displayed in Table II. We use the unifactorial model for the Islamic portfolio funds, SRI, and conventional funds for the whole period. To homogenise the series of all these funds (following each series availability), the period June 1987-February 2018 has been taken. The US market proxy used for the estimations is from the Fama and French website.

We have calculated Jensen's alpha for all three portfolios and to facilitate comparisons, as Climent and Soriano (2011), we also assess two 'difference' portfolios constructed by subtracting SRI and conventional fund returns from Islamic fund returns. These portfolios enable an assessment of differences in risk and return for the differing investment approaches. We attribute differences in the risk-adjusted average performance between Islamic funds and SRI/ conventional funds to Sharia screens. The model used is CAPM. This model relates, linearly, the performance of any financial asset with its market risk.

TABLE II

Empirical results for 1-factor regressions 1987-2018

	α	β	Adj.R^2
Portfolio			
Islamic (1)	-5.07 (-4.77)***	0.86(37.33)***	0.85
SRI (2)	-6.39 (-5.42)***	0.96(27.22)***	0.85
Conventional(3)	-5.83(-5.30)***	0.83(28.43)***	0.85
Difference			
(1)-(2)	-1.76 (-1.23)	-0.09(-2.32)**	0.03
(1)-(3)	-2.32 (-1.81)*	0.03(0.99)	0.01

This table reports the results from CAPM-based regressions. To measure Islamic, SRI, and conventional mutual fund performance, we estimated the model formally defined by Eq. 1, where the market proxy is the US value-weighted portfolio from the Kenneth R. French database. The 'difference' portfolios are constructed by subtracting either SRI or conventional mutual fund returns from the returns on the Islamic mutual fund portfolio. t statistics (in brackets) are derived from Newey-West heteroskedasticity and autocorrelation consistent standard errors.

*Coefficient is statistically significant at 10% level.

**Coefficient is statistically significant at 5% level.

***Coefficient is statistically significant at 1% level.

Several conclusions appear obvious after examining Table II. Firstly, when looking into the Jensen's alpha, within the portfolios being compared, all show a negative sign. That is, they had a lower performance than the market for the period of study. Secondly, the alpha estimates for the 'difference' portfolios are insignificant at a 5% level, although we do find statistically significant difference in performance at a 10% level between Islamic and conventional mutual funds. Thirdly, regarding the beta risk, it can be seen that, from the three types of funds, SRI funds are the most sensitive to the market. The beta estimates for the 'difference' portfolio between Islamic and conventional funds is statistically

insignificant. However, this 'difference' is significant between Islamic and SRI funds. SRI funds are more market sensitive than Islamic funds.

TABLE III

Empirical results for 1-factor regressions 1987-2018 (MSCI USA Index)

	α	β	Adj.R^2
Portfolio			
Islamic (1)	-1.61(-1.42)	0.85(42.04)***	0.82
SRI (2)	-2.97(-2.26)**	0.96(31.68)***	0.84
Conventional(3)	-2.47 (-2.08)**	0.83(25.83)***	0.85
Difference			
(1)-(2)	1.36 (0.96)	-0.10(-3.06)***	0.04
(1)-(3)	0.86 (0.71)	0.02(0.61)	0.01

This table reports the results from CAPM-based regressions. To measure Islamic, SRI, and conventional mutual fund performance, we estimated the model formally defined by Eq. 1, where the market proxy is the MSCI US Index. The 'difference' portfolios are constructed by subtracting either SRI or conventional mutual fund returns from the returns on the Islamic mutual fund portfolio. t statistics (in brackets) are derived from Newey-West heteroskedasticity and autocorrelation consistent standard errors.

*Coefficient is statistically significant at 10% level.

**Coefficient is statistically significant at 5% level.

***Coefficient is statistically significant at 1% level.

Several alternative specifications of Equation (1) were tested. For instance, in Table III, we replaced the market proxy from Fama and French with the MSCI USA Index. In this case, the obtained alphas differ for the three portfolios from previous results. In particular, the alpha for Islamic funds is now insignificant. The alpha estimates for the 'difference' portfolios are insignificant. This means there is no statistical difference between Islamic,

SRI, and conventional fund performances. Regarding the beta estimates, results are very similar to those of the previous table.

It is important to be aware of the following fact. The Islamic Sharia dictates the financial behaviour of any business agent involved in Islamic investments. Accordingly, the single-factor regression of excess Islamic fund returns on a standard equity index could produce biased estimates of mutual fund performance. For this reason, it is worthwhile considering a relevant Islamic equity index to assess the performance of Islamic mutual funds.

The calculations are done again. This time using the returns on the MSCI USA Islamic Index as the determinant factor within the unifactorial model. As the MSCI USA Islamic Index has been introduced recently, it is only possible to estimate the Jensen alpha using the monthly returns Islamic index for the 2007-2018 period.

We then ran a similar single-index regression using data from a broad SRI index as the market proxy. We used the KLD400 (formerly KLD's Domini 400 Social Index) for data from the period 1990–2018. The results are shown in Tables IV and V.

TABLE IV

Empirical results for 1-factor regressions 2007-2018 (MSCI USA Islamic Index)

	α	β	Adj.R^2
Portfolio			
Islamic (1)	-1.59 (-0.95)	0.96(23.38)***	0.84
SRI (2)	-2.27 (-1.29)	1.03(34.69)***	0.87
Conventional (3)	-3.29 (-1.64)*	0.99(33.14)***	0.84
Difference			
(1)-(2)	0.67 (0.42)	-0.07(-1.75)*	0.03

(1)-(3)	1.69 (1.26)	-0.03(-1.21)	-0.02

This table reports the results from CAPM-based regressions. To measure Islamic, SRI, and conventional mutual fund performance, we estimated the model formally defined by Eq. 1, where the market proxy is the MSCI USA Islamic Index. The 'difference' portfolios are constructed by subtracting either SRI or conventional mutual fund returns from the returns on the Islamic mutual fund portfolio. t statistics (in brackets) are derived from Newey-West heteroskedasticity and autocorrelation consistent standard errors.

*Coefficient is statistically significant at 10% level.

**Coefficient is statistically significant at 5% level.

***Coefficient is statistically significant at 1% level.

TABLE V

Empirical results for 1-factor regressions 1990-2018 (KLD400 Social Index)

	α	β	Adj.R^2
Portfolio			
Islamic (1)	-1.53 (-1.15)	0.82(27.58)***	0.76
SRI (2)	-3.24 (-2.41)**	0.92(32.97)***	0.82
Conventional(3)	-2.92 (-2.17)**	0.83(26.94)***	0.80
Difference			
(1)-(2)	1.70 (1.14)	-0.09(-2.71)***	0.03
(1)-(3)	1.39 (1.19)	-0.01(-0.23)	0.01

This table reports the results from CAPM-based regressions. To measure Islamic, SRI, and conventional mutual fund performance, we estimated the model formally defined by Eq. 1, where the market proxy is the KLD400 (formerly KLD's Domini 400 Social Index). The 'difference' portfolios are constructed by subtracting either SRI or conventional mutual fund returns from the returns on the Islamic mutual fund portfolio. t statistics (in brackets) are derived from Newey-West heteroskedasticity and autocorrelation consistent standard errors.

*Coefficient is statistically significant at 10% level.

**Coefficient is statistically significant at 5% level.

***Coefficient is statistically significant at 1% level.

With regard to the Islamic funds' portfolio, the estimated alphas in both tables are not statistically significant at the usual cut-off levels. The results therefore indicate that Islamic mutual funds are not capable of surpassing their ethical index. As expected, the adjusted R^2 from the model with the Islamic index is higher (0.84) than the R^2 from the standard single-index model (0.82), or from the model with the SRI index (0.76), indicating that the Islamic index is more capable of explaining Islamic mutual fund performance than both the standard and SRI equity indexes. Equally remarkable are the fund betas. All are positive and significant. This reveals that the Islamic fund portfolio is more exposed to the Islamic and standard market indexes ($\beta = 0.96$ and $\beta = 0.85$) than to the SRI index ($\beta = 0.82$).

A partial explanation for these finding could be that the SRI index reflects only 400 stocks, while the conventional index is representative of a larger stock universe (631) in 2018. When using an Islamic index as the market proxy, there would not be a significant difference between Islamic fund performance and SRI/conventional fund performance. The same situation is found when using an SRI index as the market proxy.

Once the analysis, using the unifactorial model has been made, the next step is to estimate the multifactor model in Equation (2). Tables VI and VII summarise the results of estimating the Carhart (1997) multifactor model using different sample periods.

TABLE VI

Multifactor regression results 1987-2018

Portfolio	α	β	SMB	HML	MOM	Adj. R^2
Islamic (1)	-4.78(-4.49)***	0.85(34.89)***	0.06(2.32)**	-0.10(-2.85)	0.01(0.41)	0.86
SRI (2)	-5.90(-5.35)***	0.93(26.14)***	0.08(1.44)	0.03(0.52)	-0.07(-2.33)**	0.86
Conventional (3)	-5.67(-5.62)***	0.84(31.40)***	-0.03(-1.28)	0.05(1.33)	-0.04(-2.05)**	0.85
Differences						
(1)-(2)	-1.91(-1.34)	-0.09(-2.43)**	-0.02(-0.23)	-0.13(-2.36)**	0.08(1.74)	0.10
(1)-(3)	-2.15(-1.79)*	0.01(0.30)	0.10(4.05)***	-0.16(-4.99)***	0.05(1.58)	0.15

This table reports empirical results corresponding to the multifactor regression formulated by Eq. 2, where the market proxy is the US market portfolio from the Kenneth R. French database, SMB denotes the difference in return between a small cap portfolio and a large cap portfolio, HML denotes the return spread between a value portfolio and a growth portfolio and MOM is the return difference between a prior 12-month winner portfolio and a prior 12-month loser portfolio. The 'difference' portfolios are constructed by subtracting either SRI or conventional mutual fund returns from the returns on the Islamic mutual fund portfolio. All parameters are annualised. t statistics (in brackets) are derived from Newey-West heteroskedasticity and autocorrelation consistent standard errors.

*Coefficient is statistically significant at 10% level.

**Coefficient is statistically significant at 5% level.

***Coefficient is statistically significant at 1% level.

If we look at the full sample period (Table VI), we immediately notice an increase in average adjusted R^2 for the multi-factor models when compared to the 1-factor CAPM models. This confirms expectations that multifactorial models are better at explaining mutual fund returns. Secondly, conventional funds tend to have less exposure to the market portfolio than SRI and the Islamic funds, which corroborates the previous 1-factor

results. Thirdly, the Islamic funds are heavily exposed to small caps when compared with SRI and conventional funds. Fourthly, the Islamic funds have a significantly different exposure to the value style (HML), and the SRI and conventional funds are more sensitive than Islamic funds.

Islamic funds do not have a significantly different exposure to the momentum factor (MOM). Lastly, after controlling for market risk, size, book-to-market, and momentum, there is still a statistically significant difference in return between Islamic and conventional funds, whereas it is insignificant between Islamic and SRI funds. During the whole period, Islamic funds performed similarly to their SRI peers, but differently from their conventional peers.[3] In a similar study, Climent and Soriano (2011), conclude that environmental funds had a worse performance than conventional funds with similar characteristics. This study reaches a different conclusion. Islamic funds had a different and better performance than conventional funds of comparable characteristics.

Following Climent and Soriano (2011), to provide an insight into these results in Table VII we divide the full sample period into two sub-periods (May 1987- June 2000 and June 2000 - February 2018). Before 2000, the Islamic portfolio is only composed by novel Islamic funds. After that date, more than a half of the Islamic funds that are active at the end of the full period are already alive. Therefore, in the second sub-period, there is a larger Islamic portfolio that is more diversified and well established.

TABLE VII

Multifactor regression results. Sub-period analysis

Panel A: 1987:06-2000:05

Portfolio	A	β	SMB	HML	MOM	Adj. R^2
Islamic (1)	-7.25(-3.65)***	0.81(22.04)***	0.09(2.24)**	-0.02(-0.33)	0.07 (1.24)	0.84
SRI (2)	-5.83(-2.72)***	1.04(17.16)***	0.17(2.41)**	0.07(0.66)	-0.22 (-2.95)***	0.83
Conventional (3)	-6.20(-4.16)***	0.77(19.69)***	-0.04(-1.08)	0.06(0.64)	-0.08 (-1.34)	0.79
Differences						
(1)-(2)	-6.68(-2.21)**	-0.22(-4.19)***	-0.07(-0.79)	-0.08(-0.71)	0.29 (2.69)***	0.19
(1)-(3)	-6.36(-2.70)***	0.04(0.85)	0.14(3.17)***	-0.07(-0.77)	0.16 (2.28)**	0.20

Panel B: 2000:06-2018:02

Portfolio	α	β	SMB	HML	MOM	Adj. R^2
Islamic (1)	-3.27(-2.51)**	0.89 (23.37)***	0.02(0.54)	-0.12(-2.70)**	0.01 (0.49)	0.88
SRI (2)	-4.94(-4.76)***	0.90(31.01)***	0.02(0.66)	0.02(0.69)	-0.04 (-2.24)**	0.91
Conventional (3)	-4.91(-4.17)***	0.91(36.37)***	-0.03(-0.91)	0.01(0.29)	0.01 (0.39)	0.91
Differences						
(1)-(2)	0.21(0.22)	-0.01(-0.40)	-0.01(-0.18)	-0.16(-4.33)***	0.05 (2.44)**	0.16
(1)-(3)	0.18(0.22)	-0.02(-1.12)	0.04(1.16)	-0.15(-5.80)***	0.01 (0.23)	0.13

This table reports empirical results corresponding to the multifactor regression formulated by Eq. 2, where the market proxy is the US market portfolio from the Kenneth R. French database, SMB denotes the difference in return between a small cap portfolio and a large cap portfolio, HML denotes the return spread between a value portfolio and a growth portfolio and MOM is the return difference between a prior 12-month winner portfolio and a prior 12-month loser portfolio. The 'difference' portfolios are constructed by subtracting either SRI or conventional mutual fund returns from the returns on the Islamic mutual fund portfolio. All parameters are annualised. t statistics (in brackets) are derived from Newey-West heteroskedasticity and autocorrelation consistent standard errors.

*Coefficient is statistically significant at 10% level.

**Coefficient is statistically significant at 5% level.

***Coefficient is statistically significant at 1% level.

In Table VII, Panel A (1987-2000), SRI funds tend to have a greater exposure to the market portfolio than Islamic funds and conventional funds. Islamic and SRI funds are heavily exposed to small caps when compared with conventional funds. Moreover, Islamic funds do not have a significantly different exposure to the value style (HML) than SRI and conventional funds. However, these funds do have a significantly different exposure to the momentum factor (MOM) than SRI and conventional funds. Finally, after controlling for market risk, size, book-to-market and momentum, the difference in return between Islamic funds and conventional/SRI funds is statistically significant. During their initial years, Islamic funds underperformed their conventional and SRI peers.

Panel B (2000-2018) shows different results from what happened in the whole period. Islamic funds tend to have less exposure to the market portfolio than SRI and conventional funds. Reddy *et al*. (2017), reach the same conclusion, giving robustness to the results. Up to then, previous tables indicated that SRI funds were the most sensitive. However, for this period, conventional funds are now the most sensitive. In this case, Islamic funds are not exposed to small caps, when compared to SRI and conventional funds. Moreover, Islamic funds have a significantly different exposure to the value style (HML) than SRI and conventional funds. Islamic funds have a significantly different exposure to the momentum factor (MOM) than SRI funds – but do not differ from conventional funds. To conclude, after controlling for market risk, size, book-to-market, and momentum, the difference in return between Islamic, SRI, and conventional funds continues being statistically insignificant.

Climent and Soriano (2011) conclude that, for the period 1987-2001, the adjusted performance achieved by green funds was significantly different from the rest of SRI and conventional mutual funds. However, in a more recent period, the adjusted performance achieved by green funds was not significantly different from the rest of SRI and conventional mutual funds. This study reaches a similar conclusion for Islamic funds.

These findings – and especially those for fund performance – reveal that during the initial sub-period (1987-2000) the results were clearly influenced by the small number of existing/available Islamic funds (2 out of 5). When the number of Islamic funds available increases (2000-2018 sub-period) the results support the expectations produced by the literature. That is to say: Islamic funds produced adjusted returns that resembled SRI and conventional mutual funds.

6. Conclusions

The investment funds that comply with Islamic law (Sharia) are a great attraction as an alternative and socially responsible investment. Islamic finances, and particularly Islamic investment funds, are booming. Currently, they are showing no signs of exhaustion. This is due to the ample field of investing companies that honour the limits established by Islamic Law.

In this article, we analyse the question of whether US mutual funds, constrained by a strategy of investment honouring Islamic law (Sharia), had a worse or better performance than other mutual funds not subjected to such a restriction during the 1987-2018 period.

The main objective of this article is to investigate if there is a clear difference between Islamic, SRI, and conventional funds. As far as we know, we are the first to examine a set of Islamic funds compared with similarly weighted portfolios of SRI and conventional funds (having similar investment characteristics). A Carhart (1997) model of four factors is used to estimate the risk-adjusted performance. With this model choice, we are also able to investigate differences in investment styles between the portfolios.

The results obtained for the whole sample period show that the inclusion of criteria following Islamic law (Sharia) does not generally have a negative impact on the risk-adjusted profitability. In other words, an initial general conclusion from the results is to reject the idea that Islamic investments produce worse results than conventional investments. In fact, none of these funds show a better performance than the market. During the analysed period, all of these funds had a negative risk-adjusted profitability, although Islamic funds showed the least negative performance.

When we divide the sample, in the second sub-period more than half of the Islamic funds are already alive. This is, Islamic funds are already mature and differences in performance cannot be attributed to inexperience.

In theory, both Islamic and SRI funds are exposed to higher risks, because they are limited in the number of shares in which they are investing. This is probably the reason why Islamic funds seem to show lower performances than their conventional peers during the first years (sub-period 1987-2000).

However, for the sub-period 2000-2018, Islamic funds perform similarly to conventional funds and do not penalise investors in a manner statistically different to conventional

funds. Moreover, the systematic risk for Islamic funds is always lower than their SRI funds counterparts. Islamic funds do not move as close to the market as the other types of funds. The consistent evidence offered by this study suggests that due to market uncertainties Islamic funds can be a viable alternative in recent periods where more than half of the Islamic funds are alive. Reddy *et al*. (2017), reach a similar conclusion for the British case. Their work concludes that for the period between 2004 and 2014, Islamic funds showed a lower risk than SRI and conventional funds. Obviously, these results could be particularly useful for portfolio managers and investors.

Finally, the obtained and commented results in this article, as with the majority of empirical studies, must be taken with some precaution, since the analysis is made for a particular period of time and sample of funds. More general conclusions could be obtained if an extensive time horizon was analysed. Similarly, another idea would be to extend this analysis to other countries or introduce new measures of statistical performance.

[1] Galema et al. (2008) offer a theoretical discussion on SRI and performance. See also Gregory et al. (1997), Bauer et al. (2007), and Fernandez and Matallín (2008) for empirical studies on UK, Canada, and Spain, respectively.

[2] Other fund performance measures can be found in Chen and Knez (1996), Ferson and Schadt (1996), Elton *et al*. (1999), Bollen and Busse (2004), or Kosowski *et al.* (2006).

[3] Similarly, Table VI was studied for the six factors of Fama and French, adding the RMW and CMA factors. It was decided not to include this table due to the lack of significance of the obtained results.

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