Social Norms and Market Segmentation: The Effects of Religious Beliefs on Stock Market Returns, Liquidity, and Liquidity Risk

Abdullah M. Al-Awadhi[1] **Michael Dempsey**[2] **Vijaya B. Marisetty**[3]

ABSTRACT

We investigate whether social norms, more specifically, religious-based trading practices, impede market development. As a natural experiment, we use data from leading countries in the Islamic financial industry, which have clearly defined religious rules on investing in stock markets. We find that non-Islamic stocks in these markets are relatively neglected, have lower liquidity, and face higher liquidity risk compared to Islamic stocks. Thus, our overall evidence supports the market segmentation hypothesis. Our results highlight a potential challenge for the stock markets of religious Islamic societies seeking to become globally competitive.

Keywords: Social norms; Market segmentation; Liquidity; Liquidity risk; Islamic stocks

---

[1]Corresponding Author: School of Economics, Finance, and Marketing, RMIT University, Australia; and, College of Business Studies, The Public Authority for Applied Education and Training (PAAET), Kuwait. E-mail address: abdullah.alawadhi@rmit.edu.au. Tel.: +61 4 7404 1774.

[2]School of Economics, Finance, and Marketing, RMIT University, Australia. E-mail address: michael.dempsey@rmit.edu.au. Tel.: +61 3 9925 5861.

[3]School of Economics, Finance, and Marketing, RMIT University, Australia. E-mail address: vijayabhaskar.marisetty@rmit.edu.au. Tel.: +61 3 9925 1431.

1 Introduction

Social norms significantly influence an individual's general behavior (Kübler 2001), investor preferences (Kim & Venkatachalam 2011), and financial decisions (Baker & Nofsinger 2012*a*) and consequently their stock market trading behavior and outcomes (Fabozzi et al. 2008, Hong & Kacperczyk 2009, Baker & Nofsinger 2012*a*).

Social norm-based stock market investing has variously been categorized as socially responsible, ethical, environmental, and faith-based investing (Baker & Nofsinger 2012*a*). This trend of socially conscious investing has grown into a widely-followed practice (Baker & Nofsinger 2012*a*), which has impacted the investment and regulatory environment (e.g., Sparkes 2001).

Following Merton's (1987) market segmentation theory, neglected stocks in a segmented market should out-perform other stocks, compensating investors for limited risk sharing. What is not so well understood is the extent to which market segmentation as an outcome of social norms enhances or impedes overall market behavior; for example, the extent to which exogenously observable beliefs interact with trading practices and liquidity.[4]

In this study we use data with an Islamic religious background to investigate

[4]Liquidity is recognized as a significant component in our understanding of asset pricing. Market traders understand that the time and cost of exercising trades are important features of stock market performance. Following the Global Financial Crisis (GFC) of 2007–2009, stock market regulators and participants have been made particularly aware of the significance of liquidity in financial markets. Research suggests that market returns can be linked to a stock's liquidity (Amihud 2002) and that liquidity risk is priced into the stock market (Chordia et al. 2000, Pastor & Stambaugh 2001, Acharya & Pedersen 2005).

liquidity and liquidity risk differences between stocks that are neglected by investors because they conflict with social norms and stocks that may be characterized as conforming with social norms.[5] Specifically, we contribute by examining the influence of social norms on stock returns, liquidity, and liquidity risk in the stock markets of the leading countries in the Islamic financial industry.

Although a number of studies examine the effect of social norms on stock returns, there is no standard definition for what defines a norm-conflicting or a norm-conforming stock (Lobe et al. 2008).[6] There are a range of norm-based screening strategies reflecting different political, religious, and ethical perspectives (Guenster 2012). Studies that focus on examining the performance of unacceptable stocks also use different definitions, which may explain differences in their results (Karlén & Poulsen 2013). In our study, we use data from a society that offers relatively unambiguous religious guidance for norm-conflicting and norm-conforming stocks. Thus, Muslim societies are able to fairly unambiguously define norm-conflicting stocks as non-Islamic stocks and norm-conforming stocks as Islamic stocks. A significant frac-

[5]Following Amihud et al. (2012), stock market liquidity can be viewed from two broad dimensions: the current level of liquidity and liquidity risk. Liquidity implies low transaction costs and low price impacts when trading. Liquidity risk is therefore the risk that a stock's level of liquidity will be reduced when the stock holder wishes to sell. Following Acharya & Pedersen (2005), liquidity risk has three dimensions: (i) commonality in liquidity with the market liquidity, (ii) return sensitivity to market liquidity, and (iii) liquidity sensitivity to market returns.

[6]A good example would be the defense industry in the United States; it is not clear whether it is considered an ethically acceptable industry by American social norms (Hong & Kacperczyk 2009).

tion of Islamic institutional investors are guided by strict explicit rules prohibiting investment in non-Islamic stocks. Thus, the level of religiosity in our study is higher than that pertaining to previous studies (U.S., Germany, and France), where differences of emphasis between Christian denominations are the focus of the study.[7] In its cleaner setting our study provides deeper insights on how the religious background affects investment decisions and corresponding market outcomes.

We contribute by attempting to understand whether social norms impede markets from becoming more competitive. For instance, the Saudi Arabia stock market has recently opened to foreigners and is seeking tens of billions of dollars in the private sector.[8] Nevertheless, Islamic investors in Saudi Arabia are guided strictly by Islamic Law and may invest only in *Shariah* compliant stocks. Hence, the market is subject to significant segmentation if a majority of investors trade only these stocks, which may have the effect of discouraging non-Islamic firms from listing in this market.

Our study finds that norm-conflicting stocks experience significantly lower trading activity and higher liquidity risk in comparison with norm-conforming stocks across

[7]According to a Gallup 2009 survey, the societies of the leading countries in Islamic financial industry included in our data have a strong belief that religion is important in daily life. In Bahrain, 94% of people believe that religion is important in life, and it is 91% in UAE, 91% in Kuwait, 95% in Qatar, and 93% in Saudi Arabia. In other countries that have been used to examine the influence of religious background on financial decisions, the percentage of people who believe that religion is important in life is much lower (e.g., United States 65%, Germany 40%, France 30%). Source: http://www.gallup.com.

[8]For more information, read the 15 June 2015 Wall Street Journal article by Ahmed Al-Omran and Rory Jones:"Saudi Stocks Slip as Foreigners Gain Access".

all of the leading countries in the Islamic financial industry. The implications of our study are important for the regulators in this region. We suggest that the market segmentation problem will need to be addressed before the Gulf stock markets can become globally competitive.

The rest of this paper is organized as follows. The next section presents the background literature review and the hypotheses development. Section 3 presents the research methodology and data used in this study. Section 4 presents the empirical results and discussion and Section 5 concludes.

2 Literature and Hypotheses Development

Each society defines morality and norm-conflicting investments in different ways. Furthermore, what is perceived as sinful differs between societies and changes over time (Fabozzi et al. 2008). Thus, it is difficult to provide a single global definition for norm-conflicting stocks. Some studies define norm-conflicting stocks as "sin" stocks, which are typically stocks of companies that operate in industries considered sinful from the perspective of a particular set of social norms. For example, many studies in relation to Western societies regard stocks of companies in alcohol, tobacco, and gaming industries as sin stocks (Hong & Kacperczyk 2009, Salaber 2009, Durand et al. 2013). Other studies include stocks that are associated with biotechnology alteration, weapons, and adult services in the definition of sin stocks (Fabozzi et al. 2008). Lobe et al. (2008) identify stocks in industries associated with alcohol, adult services, defense, gambling, nuclear, and tobacco as sin stocks. Guenster (2012)

argues that it is difficult to give a single global definition for norm-conflicting stocks, which reflects the fact that people have different political, religious, and ethical views.

In the same way that it is difficult to define norm-conflicting stocks, it is difficult to define norm-conforming stocks. Norm-conforming may refer to value-based investing, socially responsible investing, socially aware investing, green investing, and ethical investing (Schueth 2003). Baker & Nofsinger (2012*b*) define socially responsible investing (SRI) as an investment strategy that takes into consideration ethical, religious, and political values. In more recent times, investing based on social norms has been expanded to include criteria such as political issues, equality for women, labor rights, anti-nuclear activism, environmental issues, human rights, and religious criteria (Schueth 2003).

Religion is a basis for moral standards (Baker & Nofsinger 2012*b*). Some societies use religion-based definitions for norm-conflicting and norm-conforming stocks. For instance, the Arab world defines sin investments on a religious basis, which differs from the Western world (Fabozzi et al. 2008). Most religions have criteria for what is considered acceptable. Investing based on social norms has a deep-rooted history that goes back to biblical times, when Judaism set investment criteria to conform with social norms from a religious perspective (Schueth 2003).

Arab societies define sin stocks in a religious context (Fabozzi et al. 2008). Stocks of industries that conflict with Islamic *Shariah* such as usury, sales of pork, and casinos are considered norm-conflicting investments from the Islamic view (Durand et al. 2013). Ghoul & Karam (2007) compare screening strategies for Christian and Islamic "faith-based" investment funds with SRI. They conclude that although there

are some differences in the strategies of Christian, Islamic, and SRI screening criteria, they share a similar philosophy.

Fabozzi et al. (2008) examine the returns of norm-conflicting sin stocks from 21 countries for the period 1970–2007 and find that sin portfolios outperform the common benchmarks by 19% annually. Their definition of sin includes alcohol, gaming, biotechnology alteration, tobacco, weapons, and adult services industries. Hong & Kacperczyk (2009) examine the influence of social norms on stock returns for a sample of 184 U.S. sin stocks and find that these stocks outperform the relative market benchmarks.[9] Other authors find similar results, concluding that sin stocks enjoy an abnormal return (e.g., Lemieux 2003, Ahrens 2004, Luo & Balvers 2014).

Although most of the studies concentrate on examining the returns of norm-conflicting stocks in comparison to the common market benchmarks, a limited number of studies have examined the returns of norm-conflicting stocks in comparison to the returns of norm-conforming stocks. Thus, Durand et al. (2013) examine the influence of social norms on both "saints" and "sinners". Their findings suggest that sin stocks outperform the market benchmarks and the saint stocks. They define saint stocks as stocks included in the MSCI KLD400 Social Index, which consists of the 400 highest environmental, social, and governance (ESG) rated U.S. companies. Lobe et al. (2008) employ data for 32 sin and SRI international indices and find that the sin portfolios outperform the market benchmarks and the SRI indices. Liston & Soydemir (2010) compare the performance of "faith-based" and "sin" stocks in a

[9]Hong & Kacperczyk (2009) include only three industries in their definition: gaming, tobacco, and alcohol.

religious context.[10] Their results indicate that sin portfolios outperform the market and faith-based portfolios.

The literature suggests that norm-conflicting stocks earn positive abnormal returns and that these positive abnormal returns persist as long as these stocks are neglected by a significant portion of investors (Guenster 2012). This is consistent with the theoretical framework of Merton (1987), who anticipates that, in equilibrium, investors require a higher return from neglected stocks because the unsystematic risk of these stocks is priced to reflect "limited risk sharing" (Guenster 2012). Hong & Kacperczyk (2009) argue that sin stocks (norm-conflicting) are under-priced because they have a lower investor base in comparison to regular stocks. Their argument is based on the "neglect" assumption and the theoretical framework of market segmentation of Merton (1987).[11] Specifically, Hong & Kacperczyk argue that sin stocks are neglected by large institutional investors and sell-side analysts. Consequently, sin stocks have less information available to investors and must compensate investors with a higher return.

The performance of norm-conforming investing has been addressed in the context of Islamic stocks from the perspectives of mutual funds (Elfakhani et al. 2005, Abdullah et al. 2007, Hayat & Kraeussl 2011) and stock indices (Hakim & Rashidian 2002, Hassan 2002, Hashim 2008). However, whereas some studies find that Islamic

[10]They define faith-based portfolios in a religious context. They use the Dow Jones Islamic Index and the Ave Maria Fund (based on Catholic values) to calculate the faith-based portfolio return.

[11]Hong & Kacperczyk (2009) consider the stocks of public companies associated with gaming, alcohol, and tobacco as sin stocks.

investments outperform non-Islamic investments, others suggest either the opposite or find that there is little or no difference (Merdad 2012).

In mixed markets, where Islamic and non-Islamic stocks are listed on the same stock exchange, Islamic investors trade only stocks of firms that comply with the Islamic *Shariah*.[12] For instance, as displayed in Appendix I, Kuwait Finance House, one of the major institutional investors, clearly states in its Articles of Association that they should not invest in those stocks that do not comply with the Islamic *Shariah* rules. This implies that Kuwait Finance House must decline to invest in 69% of the stocks listed on the stock exchange, as only 31% of the listed stocks comply with the Islamic rules (see, Table 2). Islamic investors in mixed markets neglect non-Islamic stocks as they view trading stocks that do not comply with Islamic "*Shariah*" as "sin" stocks.[13] We have observed that norm-conflicting stock portfolios typically outperform the market (Fabozzi et al. 2008, Hong & Kacperczyk 2009, Salaber 2009, Luo & Balvers 2014) and outperform norm-conforming portfolios (Liston & Soydemir 2010).[14] Thus, we expect that non-Islamic (norm-conflicting)

[12]Islamic institutional investors are expected to follow Islamic rules as they have a *Shariah* board committee that ensures institutional transactions are acceptable within *Shariah* rules. Also, in countries with a Muslim majority and a high level of religiosity we may expect that a significant portion of retail investors follow Islamic trading rules, as is the case for markets in our study (see, for instance, the Gallup Religiosity Index).

[13]Sinful behaviors are different in each society and change over time (Fabozzi et al. 2008).

[14]Since these portfolios impose a constraint on the inclusion of possible stocks, there is a diversification cost (Guenster 2012). Empirical studies provide some evidence that SRI (norm-conforming) stocks no longer outperform the market (e.g., Derwall et al. 2011, Bebchuk et al. 2013).

stocks outperform Islamic (norm-conforming) stocks and compensate investors for their limited risk sharing. That leads us to our Hypothesis 1:

Hypothesis 1: Non-Islamic stocks outperform Islamic stocks.

Hong & Kacperczyk (2009) suggest that a norm-conflicting stock premium can be explained by the litigation risk or a neglect effect.[15] Their finding supports the neglected effect explanation that sin stocks are neglected by large institutional investors and analysts. They also expect that sin stocks should have lower liquidity (they actually find an insignificant liquidity difference between sin stocks and other market stocks). However, Luo & Balvers (2014), using Amihud's 2002 illiquidity ratio as a liquidity proxy, find that sin stocks (norm-conflicting) have a smaller investor base and lower liquidity than regular stocks. In contrast, norm-conforming stocks are expected to have a higher investor base as they are widely acceptable. Fernando et al. (2009), using a bid-ask spread liquidity measure, confirm that stocks of environmental firms (norm-conforming) have a higher stock market liquidity.

In an Islamic context, Abdullah & Bacha (2001) examine the impact of the decision to add or delete a stock from the list of norm-conforming *Halal* stocks on the Kuala Lumpur Stock Exchange and find that inclusion of a stock on the *Halal* list has a positive impact on trading volume, whereas deletion has a significant negative effect in the 60-day window post announcement.[16] The mixed market traders trade

[15]Hong & Kacperczyk (2009) consider the stocks of public companies associated with gaming, alcohol, and tobacco as sin (norm-conflicting) stocks.

[16]*Halal* stocks are stocks that comply with Islamic *Shariah* rules.

Islamic stocks, but only non-Islamic traders trade non-Islamic stocks. Thus, Islamic and non-Islamic stocks have different levels of investor bases in mixed markets. We expect that the higher investor base of the Islamic stocks can increase their trading volume and liquidity in comparison to the non-Islamic stocks (e.g., Tauchen & Pitts 1983, Amihud et al. 1999). Thus, our Hypothesis 2 is as follows:

Hypothesis 2: Norm-conforming (Islamic) stocks are more liquid than norm-conflicting (non-Islamic) stocks.

The uncertainty of future liquidity leads to liquidity risk (Amihud 2005). Acharya & Pedersen (2005) introduce a liquidity-adjusted form of the CAPM that captures expected liquidity and three types of liquidity risk. The three liquidity risk factors (betas) used in our study are: (i) Commonality in liquidity with the market liquidity, $cov(c^i, c^M)$. Such a relationship is anticipated because investors expect to be rewarded for holding a security that becomes illiquid when the market in general becomes illiquid (Acharya & Pedersen 2005). (ii) Return sensitivity to market liquidity, $cov(r^i, c^M)$. Acharya & Pedersen (2005) find that $cov(r^i, c^M)$ affects the required returns negatively because investors are willing to accept a lesser return on an asset with a high return in times of market illiquidity. (iii) Liquidity sensitivity to market returns, $cov(c^i, r^M)$. Acharya & Pedersen (2005) interpret this effect as due to the willingness of investors to accept a lower expected return on a security that is liquid in a down market. When the market declines investors have less wealth and the ability to sell easily is particularly valuable. Hence, an investor is prepared to accept a lower return on stocks with low illiquidity costs in states of low market

return.

Liquid stocks have lower commonality with market liquidity, lower return sensitivity to market liquidity, and lower liquidity sensitivity to market returns (Acharya & Pedersen 2005). In other words, stocks that are more liquid in absolute terms also tend to have lower liquidity risk. That leads us to hypothesize the following:

Hypothesis 3: Norm-conforming (Islamic) stocks have less liquidity risk than norm-conflicting (non-Islamic) stocks.

3 Research Methodology and Data

3.1 Abnormal Return Tests

To test Hypothesis 1 and examine the relative performances of Islamic and non-Islamic stocks, we are motivated to follow Hong & Kacperczyk (2009) in applying a cross-sectional test subject to Newey & West's (1987) standard errors, while controlling for firm-specific characteristics, to determine whether non-Islamic stocks outperform Islamic stocks controlling for firm-specific differences. Thus, we estimate stock returns as

$$EXR_{i,t} = \alpha_0 + \alpha_1 D_{i,t-1} + \alpha_2 X_{i,t-1} + \varepsilon_{i,t}, \tag{1}$$

where $EXR_{i,t}$ is the excess monthly return to risk-free rate of stock i regressed on the lagged previous monthly values of the firm return predictors, which are $D_{i,t}$ as a dummy variable equal to 1 if the stock is Islamic and 0 if the stock is non-Islamic, and

$X_{i,t-1}$ as the firm-specific characteristics, and ε_t is the error term. The firm-specific characteristics variables, $X_{i,t-1}$, are the log of the monthly firm market capitalization, $LSIZE_{i,t}$; the monthly industry rolling beta for stock i calculated from the previous three years, $BETA_{i,t}$; the average daily turnover, $TOV_{i,t}$, for stock i for the month t; the monthly log of the stock market/book ratio, $LMB_{i,t}$; the average monthly return for stock i in the previous 12 months, $RET_{i,t}$; and the log of the firm age, $LAGE_{i,t}$.[17]

The coefficient α_1 indicates whether Islamic stocks have higher or lower returns than non-Islamic stocks after controlling for firm-specific characteristics. The null hypothesis is that α_1 is zero, whereas our expectation is that it will be significantly less than zero. α_2 is the coefficient of the control variables.

3.2 Liquidity Difference Tests

3.2.1 Liquidity differences test

To examine whether market segmentation creates liquidity differences between norm-conflicting (non-Islamic) and norm-conforming (Islamic) stocks we apply a cross-sectional regression as

$$L_{i,t} = \alpha_0 + \alpha_1 D_{i,t-1} + \alpha_2 X_{i,t-1} + \varepsilon_{i,t}, \tag{2}$$

[17]Following previous studies to minimize the influence of the outliers, we take the natural logarithm of the firm market capitalization, the stock market/book ratio, and the firm age (Galema et al. 2008, Hong & Kacperczyk 2009).

where the dependent variable $L_{i,t}$ is the liquidity proxy for stock i at time t. We use five liquidity proxies: the log of the trading volume (number of shares), $LVOL_{i,t}$; the log of the amount volume (value of shares), $LAVOL_{i,t}$, in local currency; the stock turnover ratio, $TOV_{i,t}$, calculated as the monthly trading volume divided by the number of shares outstanding; Amihud's (2002) illiquidity ratio, $ILLIQ_{i,t}$; and Karolyi et al.'s (2012) adjusted form of the illiquidiy ratio, $LILLIQ_{i,t}$.[18] $D_{i,t}$ is a dummy variable that is equal to 1 if the stock is Islamic and 0 otherwise. $X_{i,t-1}$ are the variables for the firm-specific characteristics that are anticipated to affect the stock liquidity: $LSIZE_{i,t}$, $LMB_{i,t}$, $RET_{i,t}$, and $BETA_{i,t}$, as defined above (e.g., Datar et al. 1998, Amihud et al. 2015).

3.2.2 Liquidity risk differences test

To test whether market segmentation creates a difference between Islamic and non-Islamic stock liquidity risk, we use the liquidity risk factors of Acharya & Pedersen's (2005) liquidity-adjusted CAPM. Their liquidity-adjusted CAPM captures the expected liquidity and three types of liquidity risk:

$$E(r_{i,t} - r_{f,t}) = E(c_t^i) + \lambda\beta_i^1 + \lambda\beta_i^2 - \lambda\beta_i^3 - \lambda\beta_i^4, \tag{3}$$

where $E(r_{i,t} - r_{f,t})$ is the expected net return and $E(c_t^i)$ is the expected relative illiquidity cost, and

[18] Previous studies in the literature use the same liquidity proxies and suggest that they successfully capture the essential dimensions of the liquidity (Rahim & Nor 2006).

$$\beta_i^1 = \frac{cov(r_t^i, r_t^M - E_{t-1}(r_t^M))}{var(r_t^M - E_{t-1}(r_t^M) - [c_t^M - E_{t-1}(c_t^M)])} \tag{4}$$

$$\beta_i^2 = \frac{cov(c_t^i - E_{t-1}(c_t^i), c_t^M - E_{t-1}(c_t^M))}{var(r_t^M - E_{t-1}(r_t^M) - [c_t^M - E_{t-1}(c_t^M)])} \tag{5}$$

$$\beta_i^3 = \frac{cov(r_t^i, c_t^M - E_{t-1}(c_t^M))}{var(r_t^M - E_{t-1}(r_t^M) - [c_t^M - E_{t-1}(c_t^M)])} \tag{6}$$

$$\beta_i^4 = \frac{cov(c_t^i - E_{t-1}(c_t^i), r_t^M - E_{t-1}(r_t^M))}{var(r_t^M - E_{t-1}(r_t^M) - [c_t^M - E_{t-1}(c_t^M)])} \tag{7}$$

and λ is conceptualized as

$$\lambda = E(r_t^M - c_t^M - r^f). \tag{8}$$

The betas are described as follows. β^1 is the classical CAPM beta adjusted for the illiquidity cost. β^2 measures the stock illiquidity sensitivity to the market aggregate illiquidity. Thus, the higher the β^2, the higher the liquidity risk and the greater the expected return required by the investors. β^3 measures the stock return exposure to market-wide shocks. Thus, assets with more negative β^3 have a higher required return because these stocks are riskier. β^4 measures the sensitivity of a stock's illiquidity cost to the market return. Thus, the more negative β^4 is, the higher the risk, and the greater the expected return required by the investors (because risk-averse investors prefer stocks with liquidity costs that do not rise when the market

return falls).[19]

To calculate the Acharya & Pedersen (2005) model liquidity risk betas of Islamic and non-Islamic stocks, we proceed as follows:

(i) For each month t of our sample we estimate Karolyi et al.'s (2012) adjusted form of Amihud's (2002) illiquidity measure as[20]

$$LILLIQ_{i,t} = \frac{1}{Days_t^i} \sum_{d=1}^{Days_t^i} log\left(1 + \frac{|R_{td}^i|}{V_{td}^i}\right), \tag{9}$$

where R_{td}^i is the return on day d in month t, and V_{td}^i is the volume amount in local currency (in millions). We then calculate the $LILLIQ$ for the market portfolio and both the Islamic and non-Islamic portfolios.

(ii) Liquidity is persistent and the level of autocorrelation in the market illiquidity for the monthly data is high. For this reason, in line with previous studies (Pastor & Stambaugh 2001, Acharya & Pedersen 2005, Lee 2011), we calculate the innovation of illiquidity of the portfolios when computing the liquidity betas. To compute the market illiquidity innovation we run the following regression:

$$(LILLIQ_t^M P_{t-1}^M) = a_0 + a_1(LILLIQ_{t-1}^M P_{t-1}^M) + u_t, \tag{10}$$

[19]The liquidity risk betas in this model are associated with: (i) the commonality in liquidity with the market liquidity $cov(c^i, c^M)$; (ii) the return sensitivity to the market liquidity $cov(r^i, c^M)$; and (iii) the liquidity sensitivity to the market returns $cov(c^i, r^M)$.

[20]The $LILLIQ$ of Karolyi et al. (2012) is calculated by adjusting Amihud's (2002) illiquidity measurement, adding a constant, and calculating the log of the daily illiquidity ratio, thereby reducing the influence of outliers.

for the market portfolio as well as for the Islamic and non-Islamic illiquidity portfolios. We estimate the innovations in illiquidity using the first order autoregressive AR(1), as Equation (10), where the residual, u_t, of the regression is the illiquidity innovation, and similar to Acharya & Pedersen (2005), we introduce the market capitalizations ratio P_{t-1}^{M} as a scaling factor to ensure that the model of illiquidity is relatively stationary.

(iii) Using these illiquidity innovations and returns, we estimate the monthly liquidity risk rolling betas as equations 5–7, based on a 36 months rolling window. This is consistent with previous studies that calculate the beta for asset pricing models based on a 36 months rolling window (e.g., Florackis et al. 2011).

In addition, to capture the total effect of the three liquidity risk dimensions, we follow Acharya & Pedersen (2005) and Lee (2011) by calculating the net liquidity beta as:

$$\beta_i^{Lnet} \equiv \beta_i^2 - \beta_i^3 - \beta_i^4 \tag{11}$$

The final step is to test the difference between Islamic and non-Islamic stock liquidity risk by running cross-sectional regressions after controlling for firm-specific factors that affect stock liquidity.

3.3 Data

Our study is based on stock markets in religious Islamic societies that have both "Islamic" and "non-Islamic" stocks. Figure 1 displays the leading countries of Islamic finance: Iran, Saudi Arabia, Malaysia, United Arab of Emirates (UAE), Kuwait,

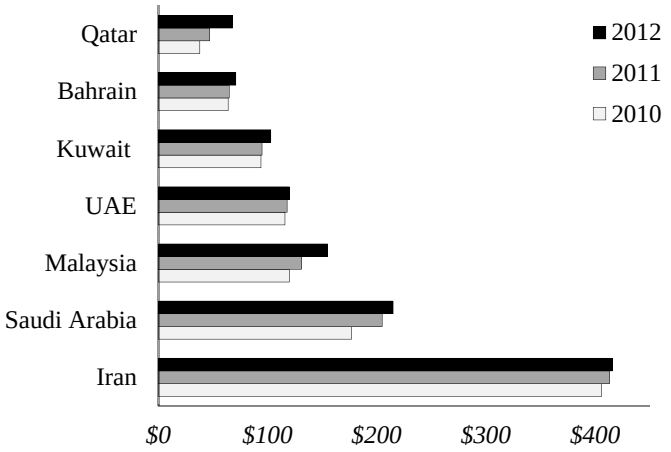

Figure 1: Size of the Global Islamic Financial Services Industry by Country in ($bn). Source: the Global Islamic Finance Report 2013.

Bahrain and Qatar. We exclude Iran from our study because it has a fully-compliant Islamic stock market (so that we cannot compare non-Islamic and Islamic stocks, Pryor (2007)), and Malaysia because of the high percentage of non-Muslims (39%) in this country (see, Table 1). Our study therefore consists of five stock markets of leading countries in the Islamic financial industry that have a high percentage of Muslims population with both Islamic and non-Islamic stocks listed in the same market.

We follow the list of *Al-Mashora and Al-Raya for Islamic Financial Consultancy* to identify Islamic-listed stocks in these stock markets.[21] Table 2 shows the number of

[21]In practice there are two general Islamic screening strategies in the mixed markets; one is strict and the other one is relaxed. The strict Islamic screening strategy divides the stocks into two categories: (1) Islamic companies (norm-conforming) and (2) conventional companies or non-Islamic companies (norm-conflicting). The relaxed Islamic screening strategy divides the stocks into three categories: (1) Islamic companies (norm-conforming); (2) non-Islamic companies but which

Islamic listed companies in each of the stock markets in our study.[22] Because, non-Islamic stocks dominate these countries, our analysis does not attract a potential selection bias that might arise due to higher Islamic stocks in countries with Islamic religious practices.

The data is sourced from Thomson Datastream, with the exception of the Kuwait market for which we used Bloomberg as our source (due to the limited availability in the Thomson Datastream). Our daily data consist of stock closing prices, shares outstanding, and trading volume for the period 2004–2014. For the same period we also obtained the firm specific variables, including the firm size, firm age, and market to book ratio.

Table 3 reports the industry concentration of Islamic and non-Islamic stocks in the countries of our study. It shows that the majority of the Islamic stocks are concentrated in the banking, insurance, and financial services industries. However, there is a significant presence of industrial firms in Kuwait and Saudi Arabia. Given that

operate in Islamic acceptable industries and have a low percentage of activities that conflict with Islamic *Shariah* (norm-accepted by some Islamic traders); and (3) non-Islamic companies with a high percentage of activities that conflict with Islamic *Shariah* (norm-conflicting). Alotaibi (2014) finds that a growing number of Islamic individual and institutional investors are adopting a strict Islamic screening strategy, and this adoption arises from religious preferences. Further, he finds that many Islamic individual and institutional investors question the *Shariah* compliance of the relaxed Islamic screening strategy. Thus, in our research we depend on the strict Islamic screening strategy to define norm-conforming and norm-conflicting stocks.

[22]We are not surprised that neither of the markets have more than 31% Islamic stocks listed in their respective stock exchanges, as the Islamic financial industry is fairly new in comparison to the conventional one.

religiosity plays an important role in investment and savings decisions, the greater number of Islamic *Shariah* compliant firms in the financial services industry reflects the demand for religious based financial products in the markets of the leading countries of the Islamic financial industry. For this reason we control for the systematic risk that is attached to the stock industry.

3.4 Descriptive Statistics

Table 4 reports our main variables of interest and their corresponding distribution statistics. Panel A reports the overall market statistics for the return cross-sectional regression variables. We report the excess return ($EXR_{i,t}$), firm size ($LSIZE_{i,t}$), beta of the stock ($BETA_{i,t}$), daily turnover ($TOV_{i,t}$), market to book ratio ($LMB_{i,t}$), average monthly return for the previous 12 months ($RET_{i,t}$), and firm age ($LAGE_{i,t}$) as our main firm-level variables. Panel A shows that the Qatar market (Kuwait) provides the highest (lowest) excess return during our sample period. Saudi Arabia has the highest trading activity with a monthly average turnover of around 131 %, whereas Bahrain is the least active market.[23]

Panel B of Table 4 reports the results of a median difference test for the return cross-sectional regression variables. This test allows for a determination of whether Islamic stocks are inherently different from non-Islamic stocks. We find that, at the median level, non-Islamic stocks do not have significantly higher excess returns

[23]The turnover ratio data confirm previous studies, namely that within the leading countries in Islamic financial industry the Saudi market has a very high turnover ratio and the Bahrain market has a very low turnover ratio (Al-Khazali et al. 2007).

compared to Islamic stocks. However, the absolute median values for non-Islamic stocks are higher than for Islamic stocks. In terms of the trading activity in relation to the turnover ratio, we observe significant differences between Islamic and non-Islamic stocks in all markets except the Dubai stock market. In the case of Bahrain, Kuwait, and Qatar, at the median level, Islamic stocks are traded more compared to non-Islamic stocks. However, in the case of Saudi Arabia, at the median level, non-Islamic stocks are traded more than Islamic stocks. The higher turnover of Islamic stocks in some countries indicates that social norms may be influencing trading activity.

We extend the trading activity-based analysis by repeating the same exercise for the liquidity variables, as reported in Table 5. We define liquidity using Amihud's (2002) illiquidity measurement as a proxy of illiquidity. The illiquidity measurement of Amihud (2002) is based on the daily data defined for stock i in month t as

$$ILLIQ_{i,t} = \frac{1}{Days_t^i} \sum_{d=1}^{Days_t^i} \frac{|R_{td}^i|}{V_{td}^i}, \tag{12}$$

where R_{td}^i is the return on day d in month t, V_{td}^i is the volume amount in local currency (in millions) on day d in month t, and $Days_t^i$ is the number of valid observation days in month t for stock i. The greater the stock price response to the change in volume, the greater the $ILLIQ_{i,t}$.[24] Panel B of Table 5 reports that, except for the Kuwait stock

[24]A comparison of Amihud's (2002) illiquidity ratio across countries is not possible because the ratio is affected by the differences in the magnitude of currency units (Karolyi et al. 2012). However, in our study, this issue need not be of concern since we are comparing the illiquidity ratio of norm-conflicting (non-Islamic) and norm-conforming (Islamic) portfolios within a country and not across countries.

market, Islamic stocks have lower illiquidity and higher trading volumes compared to non-Islamic stocks.[25] In summary, our descriptive statistics report that there is no significant difference between Islamic and non-Islamic stock returns. However, at the liquidity level, there are statistically significant differences.

4 Results

4.1 Abnormal Return Tests

In this section, we examine the return differences between norm-conflicting and norm-conforming stocks. Following Hypothesis 1, if norm-conflicting stocks are neglected these stocks are expected to compensate investors due to the limited risk sharing (Merton 1987). Also, if norm-conforming stocks are preferred by investors they are expected to be relatively overpriced because of excess demand (Galema et al. 2008). Although the summary statistics do not suggest a difference in returns between non-

[25]On 28 December 2011, the Kuwait Stock Exchange implemented significant changes in its stock market legal system and micro-structure. Firstly, on 28 December 2011, the exchange implemented the executive regulations of the Capital Markets Authority (CMA). Secondly, the CMA introduced changes in the rules for investments in securities by investment funds (e.g., Administrative Resolution 3 of 2012). Finally, the stock market micro-structure was changed from a broad-lot to an odd-lot trading system on 12 May 2012; this change in the trading system may have caused significant changes in stock returns and prices (see for instance, Hauser & Lauterbach 2003). The results for the $ILLIQ$ ratio in Table 5 for Kuwait are high due to the changes in the stock market legal system and micro-structure that commenced on 28 December 2011, where the time series average of means for the $ILLIQ$ ratio is 1.82 excluding the year 2012 and beyond.

Islamic and Islamic stocks, we may expect that norm-conflicting (non-Islamic) stocks have higher returns than norm-conforming (Islamic) stocks after controlling for firm-specific factors. To examine the possible effect of religious beliefs on stock returns we use several cross-sectional tests.

The results of the cross-sectional tests are reported in Table 6. The results suggest that there is no significant return difference between norm-conflicting (non-Islamic) and norm-conforming (Islamic) stocks after controlling for firm-specific factors in three markets, namely Bahrain, Dubai, and Saudi Arabia. On the other hand, there are significant return differences between Islamic and non-Islamic stocks in the Kuwait and Qatar markets. Islamic stocks under-perform non-Islamic stocks by 69 basis points per month in Kuwait (at 1% level of significance) and by 78 basis points per month in Qatar (at 10% level of significance). When we repeat the tests for Kuwait for 2007–2011 (excluding the changeover period of the market legal system and micro-structure, see footnote 23), the results in Table 6 Panel B show that norm-conflicting (non-Islamic) stocks significantly out-perform norm-conforming (Islamic) stocks.

Our results for Bahrain, Dubai, and Saudi Arabian markets are consistent with prior literature, which finds that in general there is no significant performance difference between Islamic and conventional stocks using different proxies (Abbes 2012, Walkshäusl & Lobe 2012, Ho et al. 2014, Dewandaru et al. 2015). However, for Kuwait and Qatar, we find evidence that neglected non-Islamic stocks outperform Islamic stocks; these results are consistent with the market segmentation theoretical framework of Merton (1987) and the empirical results of neglected stock returns in

developed countries (Lemieux 2003, Ahrens 2004, Renneboog et al. 2008, Hong & Kacperczyk 2009, Luo & Balvers 2014).

4.2 Liquidity Difference Tests

4.2.1 Liquidity difference test

Following Hypothesis 2, we expect that Islamic stocks should be more liquid than non-Islamic stocks. In this section, we report the results from testing this hypothesis using the following liquidity proxies: the log of the trading volume (number of shares traded), $LVOL_{i,t}$; the log of the amount volume (value of shares traded), $LAVOL_{i,t}$, in local currency; the stock turnover ratio, $TOV_{i,t}$, calculated as the monthly trading volume divided by the number of shares outstanding; Amihud's (2002) illiquidity ratio, $ILLIQ_{i,t}$; and Karolyi et al.'s (2012) adjusted form of the illiquidiy ratio, $LILLIQ_{i,t}$. We expect that the coefficient of the Islamic dummy variable D will be significant and positive for the $LVOL$, $LAVOL$, and TOV regressions and significant and negative for the illiquidity ratios regressions $ILLIQ$ and $LILLIQ$.

As shown in Table 7, the results of the cross-sectional regressions are consistent with our Hypothesis 2. All the significant liquidity differences, after controlling for firm-specific factors, suggest that norm-conflicting (non-Islamic) stocks are less liquid than norm-conforming (Islamic) stocks. Specifically, for all markets, Islamic stocks have higher and significant $LVOL$ and $LAVOL$ than non-Islamic stocks. For the TOV, we encounter higher and significant values for Bahrain, Kuwait, and Qatar Islamic stocks. For $ILLIQ$, the results are generally insignificant, except for Qatar, where Islamic stocks are more liquid than non-Islamic stocks. Finally, for

the $LILLIQ$, the results are significant for Kuwait, Qatar, and Saudi Arabia and reveal that Islamic stocks are more liquid than non-Islamic stocks after controlling for firm-specific factors that affect stock liquidity. We repeat the tests for Kuwait for 2007–2011 (excluding the period of change in the market legal system and micro-structure). Our unreported results show that norm-conflicting (non-Islamic) stocks are significantly less liquid than norm-conforming (Islamic) stocks for all of our five proxies.

One possible reason for the higher liquidity of norm-conforming stocks is the higher retail investor trading of Islamic stocks as cited by the Saudi Stock Market Report, 2015. The report shows that in the Saudi Arabia stock market, individual investors provide less liquidity to non-Islamic stocks than their Islamic counterparts. This is likely to be significant in a market where individual trading represents around 89% of total trading value.[26]

Overall, our results support our Hypothesis 2 that norm-conforming stocks attract more investor attention than norm-conflicting stocks.

4.2.2 Liquidity risk difference test

In this section, we conduct a cross-sectional regression to examine whether norm-conflicting stocks have a greater liquidity risk than norm-conforming stocks. The means of the monthly liquidity risk betas, calculated based on a 36 months rolling window, are reported in Table 8. The results of the cross-sectional test are reported in Table 9. As explained in the methodology section, we analyze three liquidity risk

[26]See, Saudi Arabia Stock Report, January 2015 (http://www.tadawul.com.sa).

dimensions captured by liquidity risk betas: (i) β^2 commonality in liquidity with the market liquidity $cov(c^i, c^M)$; (ii) β^3 return sensitivity to market liquidity $cov(r^i, c^M)$; and (iii) β^4 liquidity sensitivity to market returns $cov(c^i, r^M)$. The total influence of these liquidity risk betas is captured by the net beta β^{Lnet}. A higher positive β^2 indicates greater liquidity risk and a higher negative β^3 and β^4 indicates greater liquidity risk.

Firstly, we present the betas of Acharya & Pedersen (2005) for norm-conforming (Islamic) and norm-conflicting (non-Islamic) stocks separately. The results are reported in Table 8. The results in Table 8 indicate that the signs of β^2, β^3, and β^4 are consistent with Acharya & Pedersen (2005). In other words, β^2 has a positive sign and β^3 and β^4 have negative signs. This indicates that the factors driving the liquidity premium in the leading countries in Islamic financial industry are the same as in the U.S. market. We conclude that Acharya & Pedersen's (2005) model is suitable for testing the liquidity difference between Islamic and non-Islamic stocks.

The results of β^2 in all the markets are significant and suggest that Islamic stocks have lower commonality in liquidity with the market liquidity. We expect that an asset's required rate of return should increase when the asset is subject to more commonality in liquidity with the market liquidity (Chordia et al. 2002, Hasbrouck & Seppi 2001, Huberman & Halka 2001). In other words, investors expect to be rewarded for holding non-Islamic stocks that have more commonality with the market liquidity (more liquidity risk) than Islamic stocks. This result supports our Hypothesis 3.

The results of β^3 are mixed. For Kuwait, Dubai, and Qatar the results are

inconsistent with the previous literature. For β^3, Acharya & Pedersen (2005) find that stocks with high average illiquidity have large negative values for the beta that represents the $cov(r^i, c^M)$. In other words, stocks that are illiquid in absolute terms also tend to have a greater return sensitivity to market liquidity $cov(r^i, c^M)$.

The prior literature in relation to β^4 suggests that illiquid stocks in absolute terms also tend to have larger negative values for β^4 as well as high liquidity sensitivity to market returns (Acharya & Pedersen 2005). Risk-averse investors prefer stocks with liquidity costs that do not rise when the market return falls so they require higher returns from stocks with higher $cov(c^i, r^M)$. In contrast with prior findings in the literature, our results for β^4 show that more liquid stocks in absolute terms (Islamic stocks) have higher liquidity risk than the less liquid stocks (non-Islamic) in relation to $cov(c^i, r^M)$. The implication is that Islamic stocks have higher downside risk compared to non-Islamic stocks.[27]

Our results for the three liquidity risk betas lead to mixed conclusions. However, when we apply the net beta to capture the total effect of the three liquidity risk dimensions, we find that the net beta β^{Lnet} is significantly lower for Islamic stocks in all markets, suggesting that norm-conforming (Islamic) stocks in general have relatively lower liquidity risk than norm-conflicting (non-Islamic) stocks. This supports our Hypothesis 3.

[27]Previous findings suggest that Islamic stocks outperform the market only during crises (Ho et al. 2014). Based on our liquidity-risk betas, this could be a compensation for the higher liquidity sensitivity to market crashes.

5 Conclusion

Existing research indicates that social norms have significant influence on investor behavior. The question we address in this study is whether social norms in relation to religiosity impede market development. To address this issue, we avail of data from leading stock markets in the Islamic financial industry. These markets have explicit social norm rules for trading, based on Islamic *Shariah*. Nevertheless, these markets are seeking to encourage the listing of foreign norm-conflicting stocks as they strive to compete globally to become financial centers.

We test the conjecture that in markets that are dominated by strong social norms, those stocks that conflict with the accepted norms are relatively neglected. We find significant liquidity and liquidity risk differences between norm-conflicting (non-Islamic) stocks and norm-conforming (Islamic) stocks in all of our study countries. Specifically, neglected non-Islamic stocks have less liquidity and more liquidity risk in comparison to Islamic stocks.

We find significant evidence that neglected norm-conflicting stocks outperform norm-conforming stocks in Kuwait and Qatar. These results are consistent with the market segmentation theory (Merton 1987). However, our results for Bahrain, Dubai, and Saudi Arabian markets show no significant stock return difference between norm-conflicting and norm-conforming stocks. Previous research in these markets has rejected weak-form efficiency, suggesting that not all past stock information is fully incorporated in current prices (Bley 2011, Al-Ajmi & Kim 2012, Jamaani & Roca 2015). For this reasons we are not entirely surprised that market segmentation as captured by liquidity and liquidity risk has not always been reflected in the stock

prices for these markets. It is possible, however, that the return differences between norm-conflicting and norm-conforming stocks will become significant in the future for these markets as they attain higher price efficiency.

It is important for regulators and institutions to understand the consequences of investors' behavior in response to stock illiquidity. Our results highlight the possible challenges that leading countries in the Islamic financial industry will face as they seek to emerge as globally competitive stock markets. Recognizing that globalization is leading to rapidly increasing competition among world stock markets, our results indicate that stock markets in Islamic societies may lack competitiveness.

Table 1: Religion Indicators in Leading Countries in Islamic Financial Industry

This table presents the percentage of Muslims to total population and the total population in million for the leading countries in the Islamic financial industry (from the PEW Research Center, 2011 report "The Future of the Global Muslim Population").

Country	*Muslims to Total Total Population (%)*	*Total Population (million)*
Malaysia	61.4	28.4
Saudi Arabia	97.1	27.45
Iran	99.5	73.97
Qatar	77.5	1.76
Kuwait	86.4	2.74
UAE	76.0	7.51
Bahrain	81.2	1.26

Table 2: Stock Markets Description

This table presents the number of listed Islamic firms in the stock markets of our study as of 31 December 2014 (based on the list of Al-Mashora and Al-Raya for the Islamic Financial Consultancy). The table also reports the total market capitalization as of 31 December 2014 for each stock market in U.S. dollars and the average market capitalization for listed firms in each stock market in U.S. dollars (taken from Bloomberg).

Stock Market	*Number of Listed Firms*	*Islamic Firms*	*Percentage of Islamic Firms*	*Market Cap in US$ (000,000')*	*Average Firm Market Cap in US$ (000,000')*
Bahrain	48	11	23%	21,893	592
Dubai	71	20	28%	80,236	2,483
Kuwait	203	62	31%	101,179	562
Qatar	43	10	23%	154,065	7,783
Saudi	167	39	23%	482,145	2,720

Table 3: Industry Distribution of Islamic and Non-Islamic Stocks

This table presents the industry distribution percentages of the listed Islamic and non-Islamic stocks in the stock markets of our study as of 31 December 2014. The sector classification is from Worldscope's General Industry Classification. The percentage of Islamic stocks in each sector have been calculated as the number of Islamic stocks in the sector divided by the total number of Islamic stocks in the market; we calculated the percentage of non-Islamic stocks in each sector in the same way.

Stock Market	*Industrial*	*Utility*	*Transportation*	*Bank & Loan*	*Insurance*	*Other Financial*
Bahrain						
Islamic	0.0	0.0	0.0	62.5	12.5	25.0
Non-Islamic	56.7	6.7	0.0	13.3	10.0	13.3
Dubai						
Islamic	16.67	0.00	0.00	41.67	33.33	8.33
Non-Islamic	48.65	5.41	5.41	13.51	21.62	5.41
Kuwait						
Islamic	37.5	0.0	1.8	12.5	3.6	44.6
Non-Islamic	47.4	3.2	3.2	1.9	3.2	40.9
Qatar						
Islamic	0.0	0.0	0.0	30.0	20.0	50.0
Non-Islamic	54.1	5.4	8.1	13.5	8.1	10.8
Saudi						
Islamic	48.3	0.0	0.0	13.8	34.5	3.4
Non-Islamic	70.9	4.3	3.4	6.8	11.1	3.4

Table 4: Summary Statistics for the Return Regression Variables

This table presents the summary statistics for the cross-sectional regression variables for 2007–2014. The mean is the time-series average of means, the median is the time-series median of means, and the st.dev. is the time-series average of standard deviations. $LSIZE$ is the natural log of the firm size in local currency in thousands, $LMB_{i,t}$ is the monthly log of the stock market/book ratio, $BETA_{i,t}$ is the rolling beta for the industry to which firm i belongs (calculated at month t based on the previous 36 months), $TOV_{i,t}$ is stock i's average daily turnover for the month t, $RET_{i,t}$ is stock i's average monthly return for the previous 12 months, and $LAGE_{i,t}$ is the log of the firm's age calculated on a monthly basis. Panel A reports the mean, median, and st.dev. of the cross-sectional regression variables for the overall market data. Panel B reports the median equality test between Islamic and non-Islamic stocks for the cross-sectional regression variables. The p-values correspond to a WilcoxonMannWhitney signed rank median test.

Panel A: Mean, median and st. dev.							
Stock Market	*EXR (%)*	*LSIZE (000')*	*LMB*	*RET (%)*	*BETA*	*TOV (%)*	*LAGE*
Bahrain							
Mean	0.25	10.70	0.16	0.33	1.00	0.38	8.99
Median	0.26	10.68	0.19	0.33	0.98	0.29	9.01
St.dev.	0.03	0.11	0.14	0.01	0.05	0.00	0.15
Dubai							
Mean	0.59	14.16	0.22	1.65	0.96	10.43	8.72
Median	0.61	13.98	0.08	1.55	0.95	8.78	8.75
St.dev.	0.10	0.47	0.44	0.05	0.04	0.08	0.15
Kuwait							
Mean	-0.37	10.91	-0.10	-0.01	1.11	7.36	7.93
Median	0.20	10.77	-0.22	-0.11	1.08	6.02	7.91
St.dev.	0.06	0.34	0.31	0.02	0.09	0.04	0.30
Qatar							
Mean	1.04	14.89	0.49	0.83	1.02	6.31	8.59
Median	1.13	14.88	0.43	1.30	1.01	5.22	8.64
St.dev.	0.07	0.28	0.20	0.02	0.05	0.04	0.21
Saudi							
Mean	0.60	14.93	1.03	0.54	0.95	131.13	8.69
Median	0.88	14.92	1.00	1.01	0.92	79.48	8.69
St.dev.	0.08	0.25	0.22	0.02	0.06	1.83	0.16

Table 4 *(continued)*

Panel B: Median equality test							
Stock Market	*EXR (%)*	*LSIZE (000')*	*LMB*	*RET (%)*	*BETA*	*TOV (%)*	*LAGE*
Bahrain							
Islamic	-0.13	11.12	0.06	0.56	1.09	0.32	8.61
Non-Islamic	0.22	10.59	0.22	0.24	0.97	0.26	9.12
P-value	(0.63)	(0.00)	(0.24)	(0.65)	(0.00)	(0.01)	(0.00)
Dubai							
Islamic	-0.81	13.30	-0.66	1.39	1.01	8.54	8.20
Non-Islamic	0.14	14.28	0.35	1.42	0.94	8.32	8.89
P-value	(0.67)	(0.00)	(0.00)	(0.13)	(0.00)	(0.58)	(0.00)
Kuwait							
Islamic	0.06	10.59	-0.33	-0.19	1.10	8.93	7.57
Non-Islamic	0.25	10.87	-0.16	0.00	1.08	4.91	8.04
P-value	(0.84)	(0.00)	(0.00)	(0.52)	(0.00)	(0.00)	(0.00)
Qatar							
Islamic	0.96	15.02	0.54	0.62	1.18	6.42	8.66
Non-Islamic	0.95	14.84	0.42	1.46	0.96	4.44	8.63
P-value	(0.91)	(0.00)	(0.00)	(0.25)	(0.00)	(0.00)	(0.19)
Saudi							
Islamic	0.26	14.57	0.82	1.00	0.95	51.28	8.45
Non-Islamic	1.47	15.01	1.09	1.64	0.90	80.83	8.74
P-value	(0.74)	(0.00)	(0.00)	(0.41)	(0.00)	(0.00)	(0.00)

Table 5: Summary Statistics for the Liquidity Variables

This table presents the summary statistics for the liquidity variables for 2007–2014. The mean is the time-series average of means, the median is the time-series median of means, and the st.dev. is the time-series average of standard deviations. The liquidity ratios have been calculated in local currencies (this issue does not affect our analysis, since we are comparing portfolios within countries). $LVOL_{i,t}$ is the log of the trading volume for stock i in month t, $LAVOL_{i,t}$ the log of the amount of volume in local currency, $ILLIQ$ is Amihud's (2002) illiquidity ratio, and $LILLIQ$ is Karolyi et al.'s(2012) illiquidity ratio. Panel A reports the mean, median, and standard deviation (st.dev). of the cross-sectional regression variables for the overall market data. Panel B reports the median equality test between Islamic and non-Islamic stocks for the cross-sectional regression variables. The p-values correspond to a WilcoxonMannWhitney signed rank median test.

Panel A: Mean, median and st. dev.				
Stock Market	*LVOL*	*LAVOL*	*ILLIQ*	*LILLIQ*
Bahrain				
Mean	12.29	11.04	3.51	0.45
Median	12.26	10.99	1.89	1.87
St.dev.	0.52	0.60	12.32	0.19
Dubai				
Mean	16.53	17.73	1.09	0.12
Median	16.53	17.81	0.49	0.12
St.dev.	0.57	0.93	1.68	0.07
Kuwait				
Mean	15.13	13.46	852.19	0.78
Median	15.03	13.22	2.29	0.65
St.dev.	0.56	0.88	2145.19	0.42
Qatar				
Mean	14.32	17.86	0.16	0.07
Median	14.3	17.73	0.14	0.14
St.dev.	0.48	0.61	0.09	0.03
Saudi				
Mean	16.55	19.93	0.002	0.0018
Median	16.49	19.87	0.0012	0.0012
St.dev.	0.51	0.64	0.01	0.00

Panel B: Median equality test				
Stock Market	*LVOL*	*LAVOL*	*ILLIQ*	*LILLIQ*
Bahrain				
Islamic	12.42	14.22	0.83	0.27
Non-Islamic	10.68	11.76	2.1	0.48
P-value	(0.00)	(0.00)	(0.00)	(0.00)
Dubai				
Islamic	17.73	18.43	0.296	0.099
Non-Islamic	16.079	17.401	0.357	0.103
P-value	(0.00)	(0.00)	(0.08)	(0.48)
Kuwait				
Islamic	15.88	13.72	2.41	0.59
Non-Islamic	14.79	13.17	2.33	0.64
P-value	(0.00)	(0.00)	(0.31)	(0.02)
Qatar				
Islamic	14.76	18.18	0.04	0.03
Non-Islamic	14.15	17.6	0.16	0.07
P-value	(0.00)	(0.00)	(0.00)	(0.00)
Saudi				
Islamic	20.12	16.73	0.001	0.001
Non-Islamic	19.81	16.44	0.0013	0.0013
P-value	(0.03)	(0.00)	(0.02)	(0.02)

Table 6: Cross-sectional Return Tests

This table reports the coefficients of the cross-sectional regressions for 2007–2014. The dependent variable $EXR_{i,t}$ is the monthly return net of the risk-free rate for stock i in month t and $D_{i,t}$ is the dummy variable equal to 1 if the stock is Islamic and zero otherwise. $LSIZE_{i,t}$ is the monthly natural logarithm for the market capitalization of firm i, $LMB_{i,t}$ is the monthly log of the stock market/book ratio, $RET_{i,t}$ is the stock i average monthly return for the previous 12 months, and $BETA_{i,t}$ is the rolling beta for the industry to which firm i belongs, calculated at month t based on the previous 36 months. $TOV_{i,t}$ is stock i average daily turnover for the month t and $LAGE_{i,t}$ is the log of the firm's age. The standard errors are in parentheses. ***1 %, **5%, and *10% denote levels of significance.

Panel A: Cross-sectional regressions for 2007-2014							
Stock Market	*D*	*LSIZE*	*LMB*	*RET*	*BETA*	*TOV*	*LAGE*
Bahrain							
(1)	-0.002	-0.003*					
	(0.005)	(0.001)					
(2)	-0.007	-0.001	-0.012**				
	(0.006)	(0.002)	(0.005)				
(3)	-0.007	-0.001	-0.014***	-0.179***			
	(0.006)	(0.002)	(0.005)	(0.068)			
(4)	-0.008	-0.001	-0.015***	-0.196***	-0.019**		
	(0.006)	(0.002)	(0.005)	(0.068)	(0.009)		
(5)	-0.010	-0.001	-0.015***	-0.189***	-0.018**	0.859***	
	(0.006)	(0.002)	(0.005)	(0.068)	(0.009)	(0.127)	
(6)	-0.005	-0.002	-0.015***	-0.192***	-0.018**	0.870***	0.006**
	(0.006)	(0.002)	(0.005)	(0.069)	(0.009)	(0.128)	(0.003)
Dubai							
(1)	-0.014	0.001					
	(0.014)	(0.004)					
(2)	-0.015	-0.001	0.003				
	(0.016)	(0.006)	(0.005)				
(3)	-0.017	0.000	0.005	-0.147***			
	(0.016)	(0.006)	(0.005)	(0.036)			
(4)	-0.018	-0.001	0.005	-0.147***	0.019		
	(0.017)	(0.006)	(0.005)	(0.036)	(0.038)		
(5)	-0.004	0.001	-0.001	-0.001	-0.011	0.002	
	(0.010)	(0.004)	(0.004)	(0.030)	(0.026)	(0.020)	
(6)	-0.004	0.001	-0.001	-0.001	-0.009	0.004	0.002
	(0.010)	(0.005)	(0.004)	(0.030)	(0.027)	(0.021)	(0.006)

Table 6 *(continued)*

Stock Market	*D*	*LSIZE*	*LMB*	*RET*	*BETA*	*TOV*	*LAGE*
Kuwait							
(1)	-0.001	0.004***					
	(0.003)	(0.001)					
(2)	-0.001	0.001*	0.007***				
	(0.003)	(0.001)	(0.001)				
(3)	-0.001	0.002*	0.007***	-0.079**			
	(0.003)	(0.001)	(0.001)	90.026)			
(4)	-0.001	0.002	0.007*	-0.080***	0.004***		
	(0.003)	(0.001)	(0.001)	(0.026)	(0.004)		
(5)	-0.009***	0.004***	0.007***	-0.173***	-0.003	0.160***	
	(0.003)	(0.001)	(0.001)	(0.026)	(0.004)	(0.006)	
(6)	-0.007***	0.003***	0.008***	-0.175***	-0.002	0.160***	0.004***
	(0.003)	(0.001)	(0.001)	(0.026)	(0.004)	(0.006)	(0.001)
Qatar							
(1)	0.002	0.001					
	(0.004)	(0.001)					
(2)	-0.001	-0.001	0.023***				
	(0.004)	(0.001)	(0.003)				
(3)	-0.002	-0.001	0.028***	-0.218***			
	(0.004)	(0.001)	(0.004)	(0.047)			
(4)	-0.004	0.000	0.028***	-0.218***	0.012		
	(0.005)	(0.001)	(0.004)	(0.047)	(0.008)		
(5)	-0.007*	0.005***	0.024***	-0.280***	-0.006	0.210***	
	(0.004)	(0.001)	(0.003)	(0.046)	(0.008)	(0.013)	
(6)	-0.008*	0.005***	0.025***	-0.297***	-0.002	0.214***	0.006**
	(0.004)	(0.001)	(0.003)	(0.046)	(0.008)	(0.013)	(0.002)
Saudi							
(1)	0.003	0.002***					
	(0.003)	(0.001)					
(2)	0.002	0.002*	0.002**				
	(0.003)	(0.001)	(0.001)				
(3)	0.003	0.002**	0.003***	-0.262***			
	(0.003)	(0.001)	(0.001)	(0.031)			
(4)	0.003	0.002**	0.003**	-0.261***	0.017**		
	(0.003)	(0.001)	(0.001)	(0.031)	(0.007)		
(5)	0.003	0.002**	0.003***	-0.261***	0.017**	0.000	
	(0.003)	(0.001)	(0.001)	(0.031)	(0.007)	(0.000)	
(6)	0.003	0.002**	0.003***	-0.261***	0.017**	0.000	0.000
	(0.003)	(0.001)	(0.001)	(0.031)	(0.007)	(0.000)	(0.002)

Table 6 *(continued)*

Panel B: Kuwait cross-sectional regressions for 2007-2011							
Stock Market	*D*	*LSIZE*	*LMB*	*RET*	*BETA*	*TOV*	*LAGE*
Kuwait							
(1)	-0.007**	0.006***					
	(0.003)	(0.001)					
(2)	-0.007**	0.003***	0.010***				
	(0.003)	(0.001)	(0.001)				
(3)	-0.008**	0.004***	0.011***	-0.175***			
	(0.003)	(0.001)	(0.001)	(0.036)			
(4)	-0.008**	0.004***	0.011***	-0.175***	0.009*		
	(0.003)	(0.001)	(0.001)	(0.036)	(0.006)		
(5)	-0.013***	0.005***	0.011***	-0.204***	0.005	0.139***	
	(0.003)	(0.001)	(0.001)	(0.035)	(0.005)	(0.008)	
(6)	-0.012***	0.005***	0.011***	-0.203***	0.005	0.139***	0.001
	(0.003)	(0.001)	(0.001)	(0.035)	(0.006)	(0.008)	(0.002)

Table 7: Cross-sectional Liquidity Tests

This table reports the coefficients of the cross-sectional regressions for 2007–2014 for the liquidity proxies. The dependent variables are the liquidity proxies: $LVOL_{i,t}$ is the log of the trading volume, $LAVOL_{i,t}$ is the log of the amount volume in local currency, and $TOV_{i,t}$ is the stock turnover ratio calculated as the monthly trading volume divided by the number of shares outstanding. $ILLIQ$ is the illiquidity ratio of Amihud (2002) and $LILLIQ$ is the adjusted form of Amihud's (2002) illiquidity. The independent variables are firm-specific factors and D is a dummy variable that is equal to 1 if the stock is Islamic and 0 otherwise. The standard errors are in parentheses. ***1 %, **5%, and *10% denote levels of significance.

Stock Market	*D*	*LSIZE*	*LMB*	*RET*	*BETA*
Bahrain					
LVOL	1.165***	0.972***	-0.965***	2.462*	-0.198
	(0.123)	(0.040)	(0.109)	(1.428)	(0.186)
LAVOL	0.211*	1.107***	-0.475***	8.467***	0.063
	(0.114)	(0.037)	(0.101)	(1.330)	(0.173)
TOV	0.002**	0.000	0.000	-0.008	-0.002
	(0.001)	(0.000)	(0.001)	(0.012)	(0.002)
ILLIQ	-1.148	-4.195	0.768	-15.796	-4.216
	(4.896)	(1.812)	(4.565)	(64.776)	(7.971)
LILLIQ	-0.061	-0.012***	0.069***	1.364	0.323
	(0.046)	(0.017)	(0.043)	(0.612)	(0.075)
Dubai					
LVOL	1.429***	1.005***	-1.132***	0.508	0.599*
	(0.140)	(0.051)	(0.044)	(0.318)	(0.315)
LAVOL	0.634***	1.291***	-1.134***	0.364	0.799**
	(0.153)	(0.068)	(0.055)	(0.296)	(0.393)
TOV	-0.011	-0.017**	0.014	0.010	-0.011
	(0.013)	(0.006)	(0.005)	(0.026)	(0.034)
ILLIQ	0.479	-0.419***	0.311**	-0.867	-1.488*
	(0.365)	(0.134)	(0.121)	(0.910)	(0.834)
LILLIQ	-0.019	-0.051***	0.043***	-0.037	-0.103***
	(0.016)	(0.006)	(0.005)	(0.041)	(0.037)
Kuwait					
LVOL	1.252***	0.769***	-0.499***	1.228***	1.938***
	(0.045)	(0.015)	(0.017)	(0.461)	(0.070)
LAVOL	0.888***	1.133***	-0.239***	2.952***	1.282***
	(0.042)	(0.013)	(0.015)	(0.424)	(0.065)
TOV	0.052***	-0.011***	-0.003**	0.551***	0.046***
	(0.003)	(0.001)	(0.001)	(0.034)	(0.005)
ILLIQ	-164.045	-791.534***	85.449	3585.254	-614.566*
	(241.882)	(78.767)	(87.289)	(2475.722)	(373.231)
LILLIQ	-0.269***	-0.353***	0.085***	-0.914***	-0.397***
	(0.023)	(0.007)	(0.008)	(0.231)	(0.035)

Table 7 *(continued)*

Stock Market	*D*	*LSIZE*	*LMB*	*RET*	*BETA*
Qatar					
LVOL	0.429***	0.490***	-0.495***	1.355*	1.450***
	(0.072)	(0.018)	(0.056)	(0.751)	(0.127)
LAVOL	0.374***	0.661***	0.039	4.290***	1.015***
	(0.067)	(0.017)	(0.052)	(0.697)	(0.118)
TOV	0.014***	-0.027***	0.019***	0.292***	0.086***
	(0.005)	(0.001)	(0.004)	(0.056)	(0.009)
ILLIQ	-0.073***	-0.093***	0.075***	-0.622**	-0.162***
	(0.023)	(0.006)	(0.018)	(0.244)	(0.041)
LILLIQ	-0.021***	-0.036***	0.024***	-0.287**	-0.059***
	(0.031)	(0.007)	(0.018)	(0.073)	(0.012)
Saudi					
LVOL	0.298***	0.105***	-0.070***	-0.124	0.896***
	(0.034)	(0.009)	(0.010)	(0.330)	(0.077)
LAVOL	0.236***	0.188***	-0.037***	4.140***	0.928***
	(0.032)	(0.009)	(0.009)	(0.304)	(0.071)
TOV	-0.443	-1.190***	2.883***	7.635	2.957**
	(0.565)	(0.154)	(0.162)	(5.437)	(1.265)
ILLIQ	-0.0003	-0.0002**	0.0001*	-0.031***	-0.001*
	(0.000)	(0.000)	(0.000)	(0.003)	(0.001)
LILLIQ	-0.0003**	-0.0002***	0.0001**	-0.019***	-0.001*
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)

Table 8: Liquidity Risk Betas

This table reports the means of the monthly liquidity risk betas for 2007–2014 for Acharya & Pedersen's (2005) liquidity risk dimensions. The liquidity risk betas are calculated based on a 36 months rolling window. β_2 represents the commonality in liquidity with the market liquidity $cov(c^i, c^M)$, β_3 represents the return sensitivity to the market liquidity $cov(r^i, c^M)$, β_4 represents the liquidity sensitivity to the market returns $cov(c^i, r^M)$, and β^{Lnet} represents the total effect of the liquidity risk betas. The standard errors of the means are in parentheses.

	β_2	β_3	β_4	β^{Lnet}
Bahrain				
Islamic	0.490	-0.025	-0.024	0.539
	(0.013)	(0.006)	(0.004)	(0.020)
Non-Islamic	1.080	-0.017	-0.020	1.117
	(0.011)	(0.003)	(0.003)	(0.008)
Dubai				
Islamic	0.570	-0.038	-0.038	0.647
	(0.039)	(0.003)	(0.002)	(0.043)
Non-Islamic	1.072	-0.028	-0.020	1.120
	(0.024)	(0.002)	(0.003)	(0.020)
Kuwait				
Islamic	0.793	-0.014	-0.027	0.835
	(0.013)	(0.007)	(0.009)	(0.015)
Non-Islamic	0.876	-0.017	-0.002	0.894
	(0.012)	(0.006)	(0.003)	(0.008)
Qatar				
Islamic	0.546	-0.003	-0.059	0.608
	(0.021)	(0.010)	(0.014)	(0.033)
Non-Islamic	0.741	-0.021	-0.023	0.785
	(0.018)	(0.008)	(0.006)	(0.015)
Saudi				
Islamic	0.012	0.001	-0.008	0.019
	(0.001)	(0.001)	(0.000)	(0.001)
Non-Islamic	0.014	-0.006	-0.005	0.025
	(0.002)	(0.001)	(0.001)	(0.001)

Table 9: Cross-sectional Liquidity Risk Tests

This table reports the coefficients of the cross-sectional regressions for 2007–2014 for Acharya & Pedersen's (2005) liquidity risk dimensions. The dependent variables are the liquidity risk betas of the Acharya & Pedersen (2005) model. The independent variables are D, the dummy variable is equal to 1 if the stock is Islamic, and the firm-specific factors. The standard errors are in parentheses. ***1 %, **5%, and *10% denote levels of significance.

Stock Market	*D*	*LSIZE*	*LMB*	*RET (%)*	*BETA*
Bahrain					
β^2	-0.584***	0.013***	-0.057***	-0.342***	0.013
	(0.006)	(0.002)	(0.005)	(0.061)	(0.009)
β^3	-0.026***	0.006***	-0.032***	0.175***	-0.011***
	(0.002)	(0.001)	(0.001)	(0.018)	(0.003)
β^4	-0.011***	0.006***	-0.029***	0.104***	-0.001***
	(0.002)	(0.001)	(0.001)	(0.017)	(0.003)
β^{Lnet}	-0.548***	0.001***	0.004	-0.621***	0.025***
	(0.005)	(0.002)	(0.005)	(0.057)	(0.009)
Dubai					
β^2	-0.450***	-0.018***	0.018***	0.010	0.008
	(0.013)	(0.005)	(0.004)	(0.019)	(0.029)
β^3	-0.009***	0.002***	0.001***	-0.002	0.015***
	(0.001)	(0.000)	(0.000)	(0.002)	(0.002)
β^4	-0.018***	0.001***	0.001***	-0.002	0.015***
	(0.001)	(0.000)	(0.000)	(0.002)	(0.002)
β^{Lnet}	-0.423***	-0.021***	0.015***	0.014	-0.022
	(0.013)	(0.005)	(0.004)	(0.019)	(0.029)
Kuwait					
β^2	-0.074***	0.003***	0.001	0.654***	0.074***
	(0.002)	(0.001)	(0.001)	(0.022)	(0.003)
β^3	0.003***	0.005***	0.006***	0.296	0.054***
	(0.001)	(0.000)	(0.000)	(0.011)	(0.002)
β^4	-0.027***	0.005***	0.006***	0.113***	0.033***
	(0.001)	(0.000)	(0.000)	(0.009)	(0.001)
β^{Lnet}	-0.051***	-0.007***	-0.011***	0.245***	-0.014***
	(0.002)	(0.001)	(0.001)	(0.018)	(0.003)
Qatar					
β^2	-0.192***	0.011***	0.011**	0.290***	0.058***
	(0.007)	(0.002)	(0.006)	(0.077)	(0.013)
β^3	-0.003	-0.002**	0.034***	-0.262***	0.050***
	(0.003)	(0.001)	(0.003)	(0.034)	(0.006)
β^4	-0.060***	-0.001*	0.032***	-0.194***	0.035***
	(0.003)	(0.001)	(0.002)	(0.033)	(0.006)
β^{Lnet}	-0.130***	0.015***	-0.055***	0.746***	-0.028**
	(0.008)	(0.002)	(0.006)	(0.082)	(0.014)
Saudi					
β^2	-0.001***	0.000***	0.001***	-0.093***	0.014***
	(0.000)	(0.000)	(0.000)	(0.003)	(0.001)
β^3	0.008***	0.000***	0.000	-0.062***	0.005***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
β^4	-0.003***	0.000**	0.000	-0.044***	0.002***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
β^{Lnet}	-0.006***	0.001***	0.000***	0.014***	0.008***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)

Appendix I: Islamic Institutional Investors

Islamic institutional investors are guided by explicit rules that prohibit investing in stocks that conflict with Islamic *Shariah* rules. In addition, Islamic institutional investors are expected to have a *Shariah* board committee that ensures institutional transactions are acceptable within *Shariah* rules.

For example, Kuwait Finance House (KFH), an Islamic-listed institution on the Kuwait Stock Exchange, notes in Article (5) of its Memorandum & Articles of Association:

> "Purchase shares, certificates of investment and similar financial papers, either for the account of the Company or for the account of third parties provided **that they do not conflict with the Islamic *Shariah***".

Article (7) of the KFH Memorandum & Articles of Association notes that the institution has an independent *Shariah* board to ensure that they operate within Islamic rules:

> "An independent entity called the ***Fatwa* and *Shariah* Supervisory Board** is to be founded in the Company which comprises no less than three scholars who are specialized in Islamic Jurisprudence and hold university degrees in the subject to be appointed by the Company's General Assembly."

As another example, the Aljazira Takaful Ta'wuni Company, one of the Islamic-listed institutions on the Saudi Stock Exchange, notes in its prospectus in section (5):

> "The company intends to exercise cooperative insurance activity in the protection and saving sector **in compliance with the provisions of Islamic *Shariah***, in

accordance with the Cooperative Insurance Companies Control Law issued by Royal Decree No. M/32 on 02/06/1424H, and there is no intention currently to change the activity."

Section (7) of the Aljazira Takaful Ta'wuni Company prospectus notes that it has a *Shariah* board to ensure that it operates within Islamic rules and to:

"Approve the company products after affirming their **compliance with the principles of Islamic *Shariah***."

References

Abbes, M. B. (2012), 'Risk and return of Islamic and conventional indices', *International Journal of Euro-Mediterranean Studies* **5**(1), 1–23.

Abdullah, F., Hassan, T. & Mohamad, S. (2007), 'Investigation of performance of Malaysian Islamic unit trust funds: Comparison with conventional unit trust funds', *Managerial Finance* **33**(2), 142–153.

Abdullah, M. & Bacha, O. (2001), 'Halal stock designation and impact on price and trading volume', *The Journal of Accounting, Commerce & Finance-Islamic Perspective* pp. 66–97.

Acharya, V. V. & Pedersen, L. H. (2005), 'Asset pricing with liquidity risk', *Journal of Financial Economics* **77**(2), 375–410.

Ahrens, D. (2004), 'Investing in vice', *St. Martin's Press, New York* .

Al-Ajmi, J. & Kim, J. (2012), 'Are gulf stock markets efficient? evidence from new multiple variance ratio tests', *Applied Economics* **44**(14), 1737–1747.

Al-Khazali, O. M., Ding, D. K. & Pyun, C. S. (2007), 'A new variance ratio test of random walk in emerging markets: A revisit', *Financial review* **42**(2), 303–317.

Alotaibi, K. O. (2014), The Halal-based equity investments in Kuwait, PhD thesis, University of Dundee.

Amihud, Y. (2002), 'Illiquidity and stock returns: Cross-section and time-series effects', *Journal of Financial Markets* **5**(1), 31–56.

Amihud, Y., Hameed, A., Kang, W. & Zhang, H. (2015), 'The illiquidity premium: International evidence', *Journal of Financial Economics* .

Amihud, Y, M. H. . P. L. H. (2005), 'Liquidity and asset prices', *Foundations and Trends in Finance* **1**(4), 269–364.

Amihud, Y., Mendelson, H. & Pedersen, L. H. (2012), *Market Liquidity: Asset Pricing, Risk, and Crises*, Cambridge University Press.

Amihud, Y., Mendelson, H. & Uno, J. (1999), 'Number of shareholders and stock prices: Evidence from Japan', *The Journal of Finance* **54**(3), 1169–1184.

Baker, H. K. & Nofsinger, J. R. (2012*a*), 'Socially responsible finance and investing: An overview', *Socially Responsible Finance and Investing: Financial Institutions, Corporations, Investors, and Activists* pp. 1–14.

Baker, H. K. & Nofsinger, J. R. (2012*b*), *Socially Responsible Finance and Investing: Financial institutions, Corporations, Investors, and Activists*, John Wiley & Sons.

Bebchuk, L. A., Cohen, A. & Wang, C. C. (2013), 'Learning and the disappearing association between governance and returns', *Journal of Financial Economics* **108**(2), 323–348.

Bley, J. (2011), 'Are GCC stock markets predictable?', *Emerging Markets Review* **12**(3), 217–237.

Chordia, T., Roll, R. & Subrahmanyam, A. (2000), 'Commonality in liquidity', *Journal of Financial Economics* **56**(1), 3–28.

Chordia, T., Roll, R. & Subrahmanyam, A. (2002), 'Order imbalance, liquidity, and market returns', *Journal of Financial Economics* **65**(1), 111–130.

Datar, V. T., Y Naik, N. & Radcliffe, R. (1998), 'Liquidity and stock returns: An alternative test', *Journal of Financial Markets* **1**(2), 203–219.

Derwall, J., Koedijk, K. & ter Horst, J. (2011), 'A tale of value-seeking versus profit-driven investors', *Journal of Banking and Finance* **35**(8), 2137–2147.

Dewandaru, G., Bacha, O. I., Masih, A. M. M. & Masih, R. (2015), 'Risk-return characteristics of Islamic equity indices: Multi-timescales analysis', *Journal of Multinational Financial Management* **29**, 115–138.

Durand, R. B., Koh, S. & Limkriangkrai, M. (2013), 'Saints versus sinners. Does morality matter?', *Journal of International Financial Markets, Institutions and Money* **24**, 166–183.

Elfakhani, S., Hassan, M. K. & Sidani, Y. (2005), Comparative performance of Islamic versus secular mutual funds, *in* '12th Economic Research Forum Conference in Cairo, Egypt', pp. 19–21.

Fabozzi, F. J., Ma, K. & Oliphant, B. J. (2008), 'Sin stock returns', *Journal of Portfolio Management* **35**(1), 82–94.

Fernando, C., Sharfman, M. P. & Uysal, V. B. (2009), Do investors want firms to be green? Environmental performance, ownership and stock market liquidity., *in* 'Academy of Management Proceedings', Vol. 2009, Academy of Management, pp. 1–6.

Florackis, C., Gregoriou, A. & Kostakis, A. (2011), 'Trading frequency and asset pricing on the London Stock Exchange: Evidence from a new price impact ratio', *Journal of Banking & Finance* **35**(12), 3335–3350.

Galema, R., Plantinga, A. & Scholtens, B. (2008), 'The stocks at stake: Return and risk in socially responsible investment', *Journal of Banking & Finance* **32**(12), 2646–2654.

Ghoul, W. & Karam, P. (2007), 'MRI and SRI mutual funds: A comparison of Christian, Islamic (morally responsible investing), and socially responsible investing (SRI) mutual funds', *The Journal of Investing* **16**(2), 96–102.

Guenster, N. (2012), 'Performance implications of SR investing: Past versus future', *Socially Responsible Finance and Investing: Financial Institutions, Corporations, Investors, and Activists* **443**.

Hakim, S. & Rashidian, M. (2002), Risk and return of Islamic stock market indexes, *in* '9th Economic Research Forum Annual Conference in Sharjah, UAE on October 26', Vol. 28.

Hasbrouck, J. & Seppi, D. J. (2001), 'Common factors in prices, order flows, and liquidity', *Journal of Financial Economics* **59**(3), 383–411.

Hashim, N. (2008), 'The FTSE global Islamic and the risk dilemma', *AIUB Business and Economics Working Paper Series* **8**.

Hassan, M. K. (2002), Risk, return and volatility of faith-based investing: The case of Dow Jones Islamic Index, *in* 'Paper in Proceedings of 5th Harvard University Forum on Islamic Finance, Harvard University'.

Hauser, S. & Lauterbach, B. (2003), 'The impact of minimum trading units on stock value and price volatility', *Journal of Financial and Quantitative Analysis* **38**(03), 575–589.

Hayat, R. & Kraeussl, R. (2011), 'Risk and return characteristics of Islamic equity funds', *Emerging Markets Review* **12**(2), 189–203.

Ho, C. S. F., Rahman, N. A. A., Yusuf, N. H. M. & Zamzamin, Z. (2014), 'Performance of global Islamic versus conventional share indices: International evidence', *Pacific-Basin Finance Journal* **28**, 110–121.

Hong, H. & Kacperczyk, M. (2009), 'The price of sin: The effects of social norms on markets', *Journal of Financial Economics* **93**(1), 15–36.

Huberman, G. & Halka, D. (2001), 'Systematic liquidity', *Journal of Financial Research* **24**(2), 161–178.

Jamaani, F. & Roca, E. (2015), 'Are the regional gulf stock markets weak-form efficient as single stock markets and as a regional stock market?', *Research in International Business and Finance* **33**, 221–246.

Karlén, A. & Poulsen, S. (2013), 'Can it be good to be bad?: Evidence on the performance of US sin stocks', *Unpublished Manuscript* .

Karolyi, G. A., Lee, K.-H. & Van Dijk, M. A. (2012), 'Understanding commonality in liquidity around the world', *Journal of Financial Economics* **105**(1), 82–112.

Kim, I. & Venkatachalam, M. (2011), 'Are sin stocks paying the price for accounting sins?', *Journal of Accounting, Auditing & Finance* **26**(2), 415–442.

Kübler, D. (2001), 'On the regulation of social norms', *Journal of Law, Economics, and Organization* **17**(2), 449–476.

Lee, K.-H. (2011), 'The world price of liquidity risk', *Journal of Financial Economics* **99**(1), 136–161.

Lemieux, P. (2003), 'Does vice pay?', *National Post April* **4**.

Liston, D. P. & Soydemir, G. (2010), 'Faith-based and sin portfolios: An empirical inquiry into norm-neglect vs norm-conforming investor behavior', *Managerial Finance* **36**(10), 876–885.

Lobe, S., Roithmeier, S. & Walkshäusl, C. (2008), 'Vice vs virtue investing', *Unpublished Manuscript* .

Luo, H. A. & Balvers, R. J. (2014), 'Social screens and systematic boycott risk', *Forthcoming, Journal of Financial and Quantitative Analysis* .

Merdad, H. J. (2012), Two Essays in Islamic finance and investment, PhD thesis, University of New Orleans.

Merton, R. C. (1987), 'A simple model of capital market equilibrium with incomplete information', *The Journal of Finance* **42**(3), 483–510.

Newey, W. K. & West, K. D. (1987), 'A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix', *Econometrica* **55**, 703–708.

Pastor, L. & Stambaugh, R. F. (2001), Liquidity risk and expected stock returns, Technical report.

Pryor, F. L. (2007), 'The economic impact of islam on developing countries', *World Development* **35**(11), 1815–1835.

Rahim, R. A. & Nor, A. H. S. M. (2006), 'A comparison between Fama and French model and liquidity-based three-factor models in predicting the portfolio returns', *Asian Academy of Management Journal of Accounting and Finance* **2**(2), 43–60.

Renneboog, L., Ter Horst, J. & Zhang, C. (2008), 'The price of ethics and stakeholder governance: The performance of socially responsible mutual funds', *Journal of Corporate Finance* **14**(3), 302–322.

Salaber, J. M. (2009), 'Sin stock returns over the business cycle', *Available at SSRN 1443188* .

Schueth, S. (2003), 'Socially responsible investing in the United States', *Journal of Business Ethics* **43**(3), 189–194.

Sparkes, R. (2001), 'Ethical investment: Whose ethics, which investment?', *Business Ethics: A European Review* **10**(3), 194–205.

Tauchen, G. E. & Pitts, M. (1983), 'The price variability-volume relationship on speculative markets', *Econometrica: Journal of the Econometric Society* pp. 485–505.

Walkshäusl, C. & Lobe, S. (2012), 'Islamic investing', *Review of Financial Economics* **21**(2), 53–62.