2018-WP-02 - January 2018

The Effect of Implicit Market Barriers on Stock Trading and Liquidity

Asem Alhomaiddi, M. Kabir Hassan, and William J. Hippler

Abstract: We compare the performance of Islamic and conventional stock returns in Saudi Arabia in order to determine whether the Saudi market exhibits characteristics that are consistent with segmented markets and investor recognition effects. We sample the daily stock returns of all Saudi firms from September 2002 to 2015 and calculate important measures, including idiosyncratic volatility (Ang et al, 2006), market integration (Pukthuanthong and Roll, 2009), systematic turnover (Loughran and Schultz, 2005), and stock turnover and liquidity (Amihud, 2002). Integration tests report that Islamic stocks are more sensitive to changes in global and local macroeconomic variables than conventional stocks, supporting the hypothesis that the Islamic and conventional stock markets are segmented in Saudi Arabia. In addition, our results show that Islamic stocks have a broader investor base, lower idiosyncratic risk, higher systematic turnover, and are more liquid than conventional stocks, which support the investor recognition hypothesis. Our results provide new evidence on asset pricing in emerging markets, the evolving Islamic financial markets, and the potential impact of other implicit market barriers on global financial markets.

About the Authors: **Asem Alhomaiddi** is affiliated with the Department of Economics and Finance, University of New Orleans. He currently does research in Financial Economics. **M. Kabir Hassan** is Professor of Finance in the Department of Economics and Finance in the University of New Orleans. He currently holds two endowed Chairs-Hibernia Professor of Economics and Finance, and Bank One Professor in Business- in the University of New Orleans. Professor Hassan is the winner of the 2016 IDB Prize in Islamic Banking and Finance. Professor Hassan received his M.A. in Economics and Ph.D. in Finance from the University of Nebraska-Lincoln, USA respectively. **William J. Hippler, III** earned an M.B.A. from Millsaps College and a Ph.D. from the University of New Orleans before joining the faculty at La Verne in 2014. He teaches undergraduate and graduate finance courses and conducts research in the fields of investments and financial markets.

Keywords: Segmented markets, Islamic finance, Emerging markets, Asset pricing, Investor recognition.

JEL classification: G1, G2, F3, P5

The views expressed are those of the individual author and do not necessarily reflect official positions of Networks Financial Institute. Please address questions regarding content to **Asem Alhomaiddi** at Aalhoma1@uno.edu. Any errors or omissions are the responsibility of the author.

NFI working papers and other publications are available on NFI's website (www.networksfinancialinstitute.org). Click "Publications"

The Effect of Implicit Market Barriers on Stock Trading and Liquidity

Asem Alhomaiddi
Department of Economics and Finance
University of New Orleans
New Orleans, LA 70148
Aalhoma1@uno.edu

M. Kabir Hassan (corresponding author)
Professor of Finance
Hibernia Professor of Economics and Finance
Department of Economics and Finance
University of New Orleans
New Orleans, LA 70148
mhassan@uno.edu
504.280.6163

William J. Hippler
Assistant Professor of Finance
College of Business and Public Management
University of La Verne
1950 Third Street
La Verne, CA 91750
whippler@laverne.edu
909.448.1587

Draft: January 23, 2018

The Effect of Implicit Market Barriers on Stock Trading and Liquidity

Abstract

We compare the performance of Islamic and conventional stock returns in Saudi Arabia in order to determine whether the Saudi market exhibits characteristics that are consistent with segmented markets and investor recognition effects. We sample the daily stock returns of all Saudi firms from September 2002 to 2015 and calculate important measures, including idiosyncratic volatility (Ang et al, 2006), market integration (Pukthuanthong and Roll, 2009), systematic turnover (Loughran and Schultz, 2005), and stock turnover and liquidity (Amihud, 2002). Integration tests report that Islamic stocks are more sensitive to changes in global and local macroeconomic variables than conventional stocks, supporting the hypothesis that the Islamic and conventional stock markets are segmented in Saudi Arabia. In addition, our results show that Islamic stocks have a broader investor base, lower idiosyncratic risk, higher systematic turnover, and are more liquid than conventional stocks, which support the investor recognition hypothesis. Our results provide new evidence on asset pricing in emerging markets, the evolving Islamic financial markets, and the potential impact of other implicit market barriers on global financial markets.

Keywords: Segmented markets, Islamic finance, Emerging markets, Asset pricing, Investor recognition

JEL Classification: G1, G2, F3, P5

1. Introduction

A key role of financial markets is to produce the information and financial contracts necessary to facilitate the transfer of capital in the most efficient way possible. Advances in technology and regulatory reforms have recently reduced many of the physical and information barriers to trade; however, potential physical, legal, philosophical, information, and cultural barriers can impede capital flows and, ultimately, lead to segmented, potentially inefficient global financial markets. Understanding the dynamics of these barriers may still provide significant new economic insights. Emerging markets, aside from being an important source of economic and financial market growth, can serve as important laboratories for studying the relationship between market barriers, financial market integration, and economic efficiency. In particular, the Islamic emerging financial markets represent a unique opportunity to observe the impact that cultural differences, in the form of religious investment restrictions, can have on the efficiency of the underlying financial markets. We begin to address the effects of cultural market barriers and investor recognition by providing new evidence from the Islamic and conventional stock markets of Saudi Arabia.

Islamic financial markets have begun to have a major impact in the global economy. In particular, much research has focused on asset-pricing issues in light of emerging and Islamic financial markets. Recently, Merdad, Hassan, and Hippler (2015) find that, by complying with *Sharia* law, firms achieve lower stock returns than non-compliant, or conventional, firms. We extend their analysis by examining whether the return difference between the two classes of stock are due to market segmentation, caused by religious-based restrictions on the portfolios of Islamic investors, or from liquidity effects caused by investor recognition, or both. It is important to examine these issues, because the existence of market segmentation and investor recognition effects has important implications as to the efficiency of emerging markets, Islamic financial markets, and portfolio diversification.

The stock market of Saudi Arabia is an ideal setting for this analysis for several important reasons. First, the majority of traders in the Saudi stock market are individual traders, which gives us the opportunity to test the effect of individual recognition on trading behavior. Secondly, Saudi Arabia has a majority Muslim population, and it is known for its strong adherence to *Sharia* law, which gives us the

opportunity to test the effect of religious beliefs on investor investment decisions and portfolio construction. Third, in Saudi Arabia, clerics and Islamic finance scholars voluntarily screen stocks and financial instruments for their *Sharia* compliance and attempt to disseminate this information to the public through different media channels. This enables us to study the effect of such information on individual trading activity and determine whether this type of stock classification acts to increase the recognition of *Sharia* compliant stocks. Finally, Saudi banks, especially Islamic banks, encourage individual investment in the stock market through their *Murabaha* personal loan products, which are Islamic loans whereby a bank sells stock on credit to its customers. The customers have the discretion to choose among a portfolio of stocks, but the stocks must be *Sharia*-compliant. Consequently, potential borrowers that may initially have no interest in investing in the stock market are incentivized to gather information pertaining to *Sharia*-compliant stocks. As a consequence of these trends in the Saudi market, individual investors have become very active in trading Saudi stocks, and, as documented by the Saudi Stock Exchange (Tadawul), 90 percent of Saudi stocks are traded by individual investors¹. Therefore, using the sample of Saudi stocks makes it possible to examine the impact of *sharia*-compliance on measures of market segmentation and investor recognition.

We sample daily Saudi Arabian listed firm stock returns from 2002 to 2015, and our results support the segmentation, or impediment-to-trade, hypothesis. Conventional stocks are isolated and segmented from Islamic stocks in the Saudi market, due to an implicit, religious barrier to trade. We apply the Pukthuanthong and Roll (2009) measure of market integration and find that local and global macroeconomic factors better explain Islamic stock returns than conventional stock returns in Saudi Arabia. This result implies that economic information is better reflected in the stock returns of Islamic firms, because religious restrictions create barriers for some investors to trade conventional stocks in response to macroeconomic news. Thus, information flows disparately to conventional stock prices, and these assets become segmented and less integrated with the Saudi economy.

¹ From the Tadawul periodical publications at www.tadawul.com.sa

We also test the investor recognition hypothesis, and the results indicate that the differences in liquidity and trading activity between Islamic and conventional stock classes comes mainly from the stock visibility and individual investor recognition of these stocks gained through *Sharia* screening. Grullon et al. (2004) show that stock liquidity increases with the size of a firm's investor base, which is characterized as "the degree of firm visibility". We show that Islamic stocks have a broader investor base in Saudi Arabia. Additionally, our empirical results indicate that Islamic stocks enjoy higher liquidity and more trading activity than conventional stocks in Saudi markets; Islamic stock turnover is 20 percent higher than conventional stock turnover.

In addition, according to Amihud's (2002) illiquidity measure, Islamic stocks are 24 percent more liquid than their conventional counterparts in the Saudi market. Our results also imply that the greater turnover of Islamic stocks comes completely from systematic turnover. We apply a methodology similar to Loughran and Schultz (2005), and results show that, when investors trade stocks for market-wide reasons, they trade Islamic stocks. In other words, familiarity is an important criterion in determining the trading behavior of Saudi investors in response to macroeconomic factors. If investors trade in response to information that concerns a particular stock, they must trade that stock. On the other hand, if investors wish to trade in response to market-wide information, they choose to trade the stocks in which they are most familiar – Islamic stocks. This finding implies that conventional stocks are known to relatively fewer investors in the Saudi markets, due to the fact that they do not meet *Sharia* requirements.

We find that the religious barriers to trade and low-visibility of conventional stocks in Saudi Arabia may lead to pricing and portfolio construction inefficiencies. Namely, some investors may not hold diversified portfolios. Thus, idiosyncratic volatility may be priced (Merton, 1987) and investors in restricted, or low visibility, assets may require a "super risk premium" (Errunza and Losq, 1985). To test this implication, we follow Ang et al. (2006) and estimate firm idiosyncratic volatility as the variance of unexplained residuals estimated using the Fama and French (1993) three-factor model, Carhart (1997) four-factor model, and Pastor and Stambaugh (2003) liquidity model. The results show that Islamic stocks

have higher visibility and investor recognition, as indicated by lower estimated idiosyncratic risk, compared to conventional stocks.

Our results contribute to multiple strands of literature. To our knowledge, this is the first study to examine the liquidity and trading activity differences between Islamic and conventional stocks in the context of market segmentation and investor recognition, and we provide new empirical evidence on the subject. Our results link market segmentation to stock liquidity and trading activity by showing that the market segmentation effect can result not only from explicit, but also from implicit barriers, such as religious beliefs. Prior studies have shown that firm visibility and recognition by investors can be affected by media coverage (Fang and Peress, 2009), firm geographic location (Loughran and Schultz, 2005), listings on exchanges (Kadlec and McConnell, 1994; Foerster and Karolyi, 1999), initiation of analyst coverage (Irvine, 2003), addition to stock indices (Shleifer, 1986; Chen, Noronha, and Signal, 2004), hiring of investor relations firms (Bushee and Miller, 2012), and increases in advertising expenditures (Grullon, Kanatas, and Weston, 2004). We extend this literature by showing that *Sharia* classification affects firm visibility and recognition by equity market participants.

We link investor recognition to stock liquidity by showing that *Sharia* stock classification acts as a source of information dissemination to outside investors. Additionally, we contribute to the growing literature on Islamic finance by showing that stock screening and *Sharia* classification increases investor awareness of Islamic finance and the role of *Sharia*-compliance in the Saudi market. Our results imply that Islamic loans can benefit Islamic equity markets as a whole by increasing trading in stock markets, improving the circulation of money across different economic sectors, and lowering the external costs of funds for *Sharia*-compliant firms through increased liquidity and recognition. Finally, our results contribute to the growing literature on the effect of investor preferences and social norms on portfolio choice and asset prices. Previous studies indicate that stock prices are affected by preferences toward social responsible investing (Heinkel, Kraus, and Zechner (2001), Geczy, Stambaugh, and Levin (2003)), political preferences (Hong and Kostovetsky (2012)), religious and gambling preferences (Kumar, Page, and Spalt (2011)), and social norms (Hong and Kacperczyk (2009)). We contribute to this literature by

showing that Saudi market outcomes are affected by the preferences of Islamic investors. Our results suggest that other implicit market barriers may exist in financial markets, due to other philosophical and cultural differences, which may provide a new avenue of study for future research.

The remainder of this paper is organized as follows. In section 2, we develop our hypotheses. In section 3, we examine some prior evidence related to Islamic finance. Section 4 describes the data and methodology used in our analyses. Section 5 presents and interprets the empirical results. Section 6 provides robustness, and Section 7 summarizes the findings and concludes.

2. Market segmentation, investor recognition, and Islamic finance

As a part of efforts by Islamic scholars in providing important information to potential investors, they began screening stocks in order to classify them as *Sharia*-compliant (Islamic), or non-*Sharia*-compliant (conventional). Depending on each investor's level of adherence to their Islamic beliefs, Islamic investors typically refrain from trading stocks that are not compliant with *Sharia* law (conventional stocks) and will only trade Islamic, or *Sharia* compliant, stocks. On the other hand, non-Muslim investors, who are less motivated by Islamic religious restrictions, will trade stocks regardless of whether they are *Sharia*-compliant (Islamic), or not. Based on this system, Islamic stocks will be accepted by a wider base of both Islamic and conventional investors in Saudi Arabia, while conventional stocks will be traded only by investors that do not place an emphasis on *Sharia*-compliance. Accordingly, since the majority of stock trades in Saudi Arabia are conducted by individual investors, a stock's *Sharia* classification will affect its trading and liquidity through two potential channels.

First, a stock's *Sharia* classification creates an implicit barrier between two classes of stocks by restricting Islamic investors to trade only stocks that are classified as Islamic, or *Sharia*-compliant. We call this the market segmentation hypothesis, or the impediment-to-trade hypothesis. To illustrate the segmentation hypothesis, consider a two-country model of "partial segmentation" similar to that of Errunza and Losq (1985) in which investment barriers are asymmetric: country 1's investors can invest in country 2's securities, but country 2's investors are prohibited from investing in country 1's securities. Errunza and Losq (1985) show that country 2's (eligible) securities are priced as if markets were

completely integrated, but country 1's (ineligible) securities command a "super risk premium". If a company from country 1 cross-lists its shares in country 2, comparative statics show that the risk premium disappears, the share price increases, and the expected return decreases. A similar situation exists in segmented markets where firms issue restricted shares that only local citizens can hold and unrestricted shares that can be held by both local and foreign investors. Studies uniformly find that unrestricted shares trade at premium prices, relative to those of restricted shares. Also, Bailey, Chung and Kang (1999) find that unrestricted shares generally have large price premiums, compared to restricted shares². Therefore, an explanation of what occurs in the Islamic markets is that there are two types of investors, Islamic and conventional. Islamic stocks are traded by both Islamic and non-Islamic (conventional) traders, while conventional stocks are traded only by conventional investors.

Secondly, *Sharia* classification actively promotes Islamic stocks by increasing the base of potential investors for Islamic stocks and, therefore, makes Islamic stocks recognized by a greater number of Muslim investors than conventional stocks. The wider base of potential investors for Islamic stocks facilitates the dissemination of new information related to *Sharia*-compliant stocks and, therefore, increases their liquidity and influences trading activity. We call this the investor recognition hypothesis. The idea that "neglected" stocks earn a return premium over "recognized" stocks has been in existence for many years (e.g., Arbel et al., 1983), and Merton (1987) develops an asset pricing model that explains this apparent pricing anomaly. The key difference between Merton's model and standard asset pricing models such as the CAPM is that Merton's model assumes that investors only know about a subset of available securities and that these subsets differ across investors.

A number of studies examine the effect of firm visibility and investor recognition on stock performance. Loughran and Schultz (2005) examine the effect of a firm's geographic location on stock

²Bailey (1994) suggests that the lack of alternative investments to low-yielding bank accounts drives domestic Chinese savings into stock investments and pushes prices beyond what foreigners are willing to pay. He concludes that local Chinese demand for any available investment vehicle is even greater than the foreign demand to invest in China. Lee (2009) provides another explanation for the price premium of the restricted shares by proposing that they provide better market liquidity than the unrestricted counterparts.

visibility. They compare urban and rural firms and find that rural firm stocks (low visibility) trade much less, are covered by fewer analysts, and are owned by fewer institutions than urban firm stocks (high visibility). Additionally, Grullon et al. (2004) use firm advertising expenditure as a measure of firm visibility and find that firms with greater advertising expenditures have a larger number of individual and institutional investors, as well as higher stock liquidity. Fang and Peress (2009) argue that media coverage increases firm visibility by increasing the breadth of information dissemination, and stocks with high media coverage have a low idiosyncratic volatility, which suggests these stocks are recognized by a wider base of investors than stocks with no media coverage. Other studies that examine the effect of firm visibility on stock liquidity and trading include: Kadlec and McConnell (1994) and Foerster and Karolyi (1999) in the context of listing on exchanges; Irvine (2003) in the context of the initiation of analyst coverage; Shleifer (1986) and Chen, Noronha, and Signal (2004) in the context of additions to stock indices; and Bushee and Miller (2012) in the context of hiring investor relations firms.

There is also a growing literature that relates social norms, ethical screening, and social responsibility to stock visibility and performance. For example, Heinkel, Kraus, and Zechner (2001) examine the price implications of ethically constrained investment on polluting companies. In a similar line, Geczy, Stambaugh, and Levin (2003) find a sizeable impact of socially responsible investing on the prices of screened stocks. Hong and Kacperczyk (2009) show that sin stocks, i.e., publicly traded companies involved in the production of alcohol, tobacco, and gaming, are priced lower than other mainstream equity stocks, because they are neglected by norm-constrained institutions.

3. Previous findings on Islamic and conventional stock performance

A large number of studies have compared Islamic stocks with their conventional counterparts in terms of returns. However, these studies give inconsistent empirical evidence of the relative risk-adjusted performance of Islamic equity investments, compared to conventional ones. For example, several studies report Islamic equities outperform conventional stocks in terms of both raw and risk-adjusted returns (Alam and Rajjaque (2010); Ashraf and Mohammad (2014); Canepa and Ibnrubbian (2014); Shamsuddin (2014); Charles et al. (2015)). To the contrary, other studies find the risk-adjusted returns of Islamic

equities are no different from conventional returns (Ahmad and Ibrahim (2002); Girard and Hassan (2008); Dharani and Natarajan (2011); Walkshausl and Lobe (2012)). Adding to the already mixed results, the recent study of Merdad et al. (2015) show that, in Saudi Arabia, Islamic stocks have lower stock returns, compared to their conventional counterparts, even after accounting for market, size, and book-to-market effects.

Many studies that compare the performance and risk-return profiles between Islamic and conventional equities provide two common explanations in explaining the contradictory empirical results. First, Islamic equities have lower financial leverage, thus causing Islamic and conventional risk-return profiles to differ. Second, Islamic portfolios are less diversified (firms are concentrated in fewer sectors), which will also impact the risk-return profile of Islamic investors' portfolios. However, there is limited research that explores these perspectives in detail. Bhatt and Sultan (2012) examine whether financial leverage is a distinct and separate risk factor that explains the stock return difference between Islamic and conventional stocks and find that Islamic stocks are less sensitive to the leverage factor than conventional stocks. On the other hand, the question as to whether Islamic stock portfolios are less diversified than conventional portfolios has garnered growing research interest.

There is debate as to whether *Sharia*-compliant stocks represent a unique investment class that is distinct from conventional securities. In essence, as a result of *Sharia* stock screening, Islamic stocks have their own distinctive characteristics that may depart from those of conventional stocks. Accordingly, the returns from an investment in such an asset class may not correlate with those of conventional equities, and the corresponding portfolio risk profiles may also differ from those of conventional portfolios. Majdoub and Mansour (2014) and Balcilar et al. (2015) argue that *Sharia*-compliant equity portfolios are concentrated in few industries, which results in weak integration between the Islamic and conventional equity markets, which may pose considerable diversification benefits as a result of holding Islamic stocks. Saiti et al. (2014), Abbes and Trichilli (2015), and Mensi et al. (2015) provide similar results and suggest that the diversification benefits are more pronounced in Islamic regions. Dewandaru et al. (2014) argue that the concentration of Islamic equities in few sectors, combined with their low leverage, give rise to

dual exposure to local and global market shocks. Specifically, they find that, while Islamic portfolios are generally less exposed to shocks originating from inside the region, they are more exposed to shocks originating from outside of the region.

In terms of stock market sensitivity to macroeconomic factors, several studies document that Islamic stocks are sensitive to global macroeconomic factors, such as oil prices and U.S. interest rates (Hammoudeh et al. (2014); Naifar (2015); Yilmaz et al. (2015)). In addition, Wahyudi and Sani (2014) examine the sensitivity of Islamic capital markets in Indonesia to key macroeconomic variables and find that Islamic stocks are more sensitive to local fiscal policies. In contrast, Dewandaru et al. (2015) argue that Islamic stocks exhibit lower sensitivity to local shocks, due to their small size and low level of leverage, which makes them less attractive to stock analysts. However, this does not necessarily imply that *Sharia*-compliant firms are not accepted by investors; these stocks are mainly traded by investors who have a preference for, or are constrained to, Islamic stocks. Canepa and Ibnrubbian (2014) argue that the difference in performance between Islamic and conventional stocks cannot be explained by any variant of the efficient market model and argue that a behavioral finance model is needed. Hoepner et al. (2011) also support the behavioral explanation for the difference between Islamic and conventional stock performance. They find that [the](#) performance of Islamic funds is positively related to the influence of *Sharia* law on consumers in their home economies, and Islamic funds from Islamic economies with Muslim majorities exhibit the best performance.

4. Data and Methodology

4.1. Data sources

We obtain our daily stock return and financial data for Saudi Arabian firms from the Global COMPUSTAT and Tadawul databases. We gather monthly analyst coverage from the Institutional Brokers Estimate System (I/B/E/S) database, monthly macroeconomic factors from The International Monetary Fund (IMF) database, and the monthly number of investors from the Tadawul Exchange. We collect all data from the years 2002 to 2015. Analyst coverage is defined as the number of analysts

reporting current fiscal year annual or quarterly earnings estimates each month. The number of investors are reported at the firm-level.

4.2. *Sharia* Screening Methodology

In order to classify listed firms as Islamic or conventional, we use *Sharia* stock classification reports published by *Sharia* scholars. There are multiple *Sharia* stock classification systems reported by different *Sharia* scholars, and these classifications differ in terms of the screening process and criteria for defining Islamic firms. However, all classification methodologies share some common criteria, such as excluding firms conducting *Shariah*-prohibited activities, which include: (1) activities that involve in any form of usury or interest rates (*riba*), for example, borrowing or investing in interest bearing or fixed-income instruments; (2) activities that involve excessive risk, uncertainty, ambiguity, or deception (*gharar*); (3) activities that are related to gambling, lottery, or games of chance (*maysir*); (4) activities that are related to non-*halal* businesses, such as those that deal with pork, adult entertainment, tobacco, non-medicinal alcohol, and other businesses deemed unethical. For many firms, it is difficult not to engage in some of these activities, especially those that involve any form of interest rates. As a consequence, some *Sharia* scholars add certain exceptions to the filtering process to allow for small amounts of a normally prohibited activity. For example, if a firm is engaged in an impermissible activity, the ratio of income generated by that activity to total income must be less than a certain percentage in order for the firm to qualify as an Islamic firm; otherwise, it will be considered as a non-*Sharia* compliant, or conventional, firm. Therefore, the classifications will differ in terms of the percentage of income allowed by impermissible activities for an Islamic firm.

In this study, we rely on the *Sharia* classification of Dr.Al-Fozan³, because it is commonly used by investors, covers stocks listed in all sectors of the equity market, and is one of the strictest classifications, which insures compliance. Figure 1 shows the distribution of Islamic and conventional

³ Canepa and Ibnrubbian (2014) and Merdad et al. (2015) use an alternative classification of Dr.Al-Osaimi, which has the same level of strictness and popularity as Dr.Al-Fozan's, but it does not cover all sectors of the equity market. According to Dr. Al-Osaimi, the reason for not classifying stocks in some sectors is that these sectors usually have their own *Sharia* board classify stocks. We repeat our tests using Dr.Al-Osaimi's classification and it does not affect our main conclusions.

stocks across market sectors. It is important to note that Islamic and conventional stocks are not equally distributed across market sectors. For example, conventional stocks dominate both the petrochemical and insurance sectors, whereas Islamic stocks dominate the real estate development and transportation sectors. The heterogeneity in Islamic stock distribution across industries may cause endogeneity in our results. Specifically, the difference in visibility and investor familiarity between Islamic stocks and conventional stocks may be attributed to the fact that these stocks belong to certain sectors and not to their Islamic classification. We address this issue by controlling for sector differences using industry fixed effects.

[Insert Figure 1 here]

The first *Sharia* classification report published by Dr. Al-Fozan was released in December 2007 and classifies 28 of the 117 firms traded in the Saudi equity market as Islamic, or *Sharia*-compliant. Since our sample period begins before the first classification report was published, we assign firms that were classified as *Sharia*-compliant as Islamic from the beginning of our data until the date of the report's publication. The *Sharia* classification reports are revised periodically to add or remove firms from the list of Islamic firms according to the screening criteria previously mentioned, and we update our sample to match these reports. The *Sharia*-classification reports are publically available, and a total of nine reports have been published as of the end of 2015⁴. The total number of stocks that are classified as *Sharia*-compliant in the latest report is 89 out of the 177 firms traded in the Saudi equity market.

4.3. Descriptive Statistics

Table 1 presents summary statistics over the sample period, which spans from January 2002 to December 2015. We separate firms into Islamic and conventional firms, based on Al-Fozan's *Sharia* stock classification.

[Insert Table 1 here]

The sizes of conventional firms exhibit higher variance than that of Islamic firms, as the standard deviation of market capitalization for conventional firms is twice as large. The mean firm market

⁴ We collect the reports from the main source of Dr. Al-Fozan's stock classification reports <http://www.islammessage.com>

capitalization of conventional firms is higher (12,200) than that of Islamic firms (6,062), but conventional firms have a lower median (1,490) market capitalization than Islamic firms (1,887). The book-to-market ratio of conventional firms (0.58) is comparable to that of the Islamic firms (0.57). Islamic firms report lower leverage ratios (16.1%) than those of conventional firms (27.5%), which is expected due to the leverage requirement associated with *Sharia*-compliance. In terms of profitability, Islamic firms are more profitable than conventional firms, as Islamic firms report return-on-assets (ROA) of 6.0 percent, compared to conventional firms of 2.3 percent. The mean and median ROA for Islamic firms are three times those of conventional firms, but Islamic firm profitability is less stable than that of conventional firms, as indicated by the standard deviation of ROA. Islamic firms are also older than conventional firms and have a higher number of dividend paying firms.

In terms of stock liquidity and trading activity, although conventional stocks are more actively traded, as indicated by their higher average turnover ratio, they have [and-higher](#) Illiquidity (*ILLIQ*) and relative illiquidity (*ILLIQMA*) statistics, compared to Islamic stocks. The price ranges of Islamic and conventional stocks are comparable, which may suggest that investors have no preference for one class over the other, based on price. Islamic stocks (0.04%) have lower average daily stock returns than conventional stocks (0.06%), which is consistent with the results of Merdad et al. (2015). Average stock return volatility and momentum are lower for Islamic stocks than conventional stocks, which may attract individual investors. In addition, Islamic stocks have a higher number of investors and better analyst coverage than their conventional counterparts.

5. Results and interpretation

5.1. Breadth of ownership

In this section, we examine whether investors are more likely to buy the stock of firms that are classified as Islamic, or *Sharia*-compliant. The summary statistics in Table 1 suggests that Islamic firms have an average of 62,760 investors, compared to 56,251 for conventional firms. In addition, the table also shows that Islamic firms have [a](#) higher median, minimum, and maximum number of investors, compared with conventional firms. However, since Islamic and conventional firms have different

characteristics, univariate analysis does not provide conclusive statistical evidence. Accordingly, we perform a cross-sectional regression, which tests the difference between the two stock classes in terms of the number of investors for each class of equities.

In order to compare the breadth of investor^{IFS} base between Islamic and conventional stocks, we regress the natural logarithm of the number of shareholders against a classification dummy variable equal to unity if the stock is classified as Islamic and zero otherwise. A set of control variables, suggested in Grullon et al. (2004), controls for cross-sectional variation in the breadth of ownership. We expect the number of shareholders to increase with firm size (market capitalization), because larger firms are more likely to have greater analyst and press coverage, and they also likely have more shares available to potential investors. Therefore, we include market capitalization as a control variable to account for this size effect. We also include the inverse of the share price, since some investors prefer stocks within certain price ranges, due to transaction costs. Stock liquidity may also be preferred by investors; therefore, we include stock turnover as an additional control variable. Similarly, investors also prefer profitable stocks and stocks that have positive return momentum, so we include return on assets (ROA) and the stock's prior six-month price performance as control variables. Finally, the natural logarithms of stock return volatility, firm age, and the debt-to-assets ratio are employed as proxies for differences in risk between the two classes of stocks and to reduce the potential impact of skewness and outliers in stock return volatility and firm age. Our control variables account for effects related [to](#) stock visibility, familiarity, or investor recognition, so the remaining effect, the Islamic classification dummy variable, measures investor preference toward Islamic stocks. Since Islamic and conventional stocks are not uniformly distributed across equity market sectors, we include dummy variables that control for industry effects.

We have monthly data pertaining to the number of investors for each firm from 2010 to 2015. For each month in our sample, we run cross-sectional regressions of the form:

$$\begin{aligned} \text{Log}(\text{investors})_{i,t} = & \alpha_t + \beta_{1t} \text{Islamic} + \beta_{2t} \text{Log}(\text{Size}) + \beta_{3t} \text{ROA} + \beta_{4t} \text{Log}(\text{Age}) + \\ & \beta_{5t} \text{Momentum} + \beta_{6t} \text{Log}(\text{RV}) + \beta_{7t} \text{Invp} + \beta_{8t} \text{Log}(\text{Turnover}) + \beta_{9t} \text{DD} + \\ & \beta_{10t} \text{Leverge} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where *Islamic* is a dummy variable equal to unity if the firm is classified as Islamic and zero otherwise, *Size* is the firm's market capitalization, *ROA* is return on assets, *Age* is the number of months the stock is available in our data, *Momentum* is the average monthly stock return over the previous six months, *RV* is daily stock return volatility over the past month, *Invp* is the inverse of the share price, *Turnover* is stock turnover in the past month, *DD* is a dividend payer dummy variable equal to one if the firm paid a dividend during the year and zero otherwise, and *Leverge* is the firm's debt-to-assets ratio. We also include industry dummy variables, as previously mentioned. Results are reported in Table 2.

[Insert Table 2 here]

Table 2 presents the results from the multivariate analysis explaining breadth of ownership between Islamic and conventional stocks. We calculate monthly time-series averages of the coefficients estimated from Eq. (1) and compute Newey-West (1987) adjusted standard errors with twelve lags to account for serial correlation. Consistent with univariate results reported in Table 1, we find that Islamic firms attract a larger number of investors than that of conventional firms in the Saudi equity market, as the Islamic dummy variable coefficient is positive and statistically significant at the 10 percent level or better across all model specifications. The results reported in Table 2 are also economically significant; For example, the coefficients of the Islamic dummy variables suggest that Islamic firms have 15 to 17 percent more investors than a conventional firm, after controlling for size, profitability, trading activity, and risk effects. The results also suggest that the number of common shareholders is positively related to firm size, past returns, stock return volatility, and liquidity, but negatively related to firm profitability and age. The results also suggest that investors do not prefer dividend paying stocks, nor stocks that trade at higher prices.

In summary, the results presented in Table 2 suggest that, after controlling for variables that influence investor familiarity, stock visibility, or investor recognition, Islamic stocks have a wider base of investors, compared to conventional stocks, in the Saudi market. This evidence is consistent with our conjecture that Islamic stocks are accepted by a wider base of equity market participants in Saudi Arabia, because these stocks appeal to both *Sharia*-compliant and conventional investors. Thus, these results support differences between Islamic and conventional that are driven by investor recognition.

5.2. Idiosyncratic volatility, diversification, and investor recognition

Since Islamic stocks are potentially traded by both Islamic and conventional investors in the Saudi market, they have a broader clientele and, thus, have higher media and analyst coverage, which leads to a higher degree of investor recognition. In addition, it is important to note that, in Islamic countries, a major mechanism for Islamic banks to provide Islamic, or *Sharia*-compliant, loans is through the purchase and sale of Islamic stocks. The use of Islamic-compliant stocks to facilitate Islamic bank loans can have a major effect on Islamic stocks through two channels. First, it increases the liquidity of Islamic stocks, and, secondly, it increases the potential Islamic stock investor base by introducing new investors, bank borrowers, to the Islamic stock market.

If Islamic stock classification improves investor recognition, then its effect should be stronger among stocks that would otherwise have a lower degree of recognition. In Merton's (1987) framework, firm idiosyncratic risk is priced, because of the imperfect diversification that stems from a lack of investor recognition. Firms with higher idiosyncratic volatility should offer a return premium to compensate shareholders for the undiversified risk they bear. In this way, idiosyncratic volatility measures the amount of idiosyncratic risk borne by investors due to imperfect diversification. Hence, there should be a clear difference in the idiosyncratic risk between the two classes of stocks. Essentially, since conventional stocks cannot be traded by all Saudi market participants, some investors will hold undiversified portfolios, and idiosyncratic risk will be priced in the Saudi market.

Following Ang et al. (2006), we estimate firm idiosyncratic volatility for stock i as the variance of the residuals from regressing the daily excess returns of stock i on the factors from the Fama and French (1993) three-factor, Carhart (1997) four-factor, and Pastor and Stambaugh (2003) asset pricing models:

$$R_{i,t} = \alpha_{i,t} + \beta_{i,t} MKT + s_{i,t} SMB + h_{i,t} HML + \varepsilon_{i,t} \quad (2a)$$

$$R_{i,t} = \alpha_{i,t} + \beta_{i,t} MKT + s_{i,t} SMB + h_{i,t} HML + u_{i,t} UMD + \varepsilon_{i,t} \quad (2b)$$

$$R_{i,t} = \alpha_{i,t} + \beta_{i,t} MKT + s_{i,t} SMB + h_{i,t} HML + l_{i,t} LIQ + \varepsilon_{i,t} \quad (2c)$$

The variance of the residuals $\varepsilon_{i,t}$ is estimated using firm-month regressions of daily stock returns. Since the Fama and French (1993) factors are not available for Saudi Arabia, we follow Fama and French (2012) and construct size (SMB), value (HML), and momentum (UMD) factors. We sort stocks on size (market capitalization) and momentum and on size and the ratio of book equity to market equity (B/M). Size sorting is done at the end of June of each year, whereas B/M and momentum sorting are done on a monthly basis. Big stocks are those in the top 70 percent of market cap, and small stocks are those in the bottom 30 percent. The intersection of the independent 2 by 3 sorts on size and B/M and size and momentum produces six portfolios for use in creating the value and momentum factors. We compute daily value-weighted returns for each portfolio. The size factor (SMB) is the equal-weighted average of the returns on the three small stock portfolios from the 2 by 3 size-B/M sorts, minus the average of the returns on the three big stock portfolios. The value and momentum factors, (HML) and (UMD), are the equal-weighted averages of the returns of the small and big value, minus growth and the winners minus loser portfolios, respectively. To construct the liquidity factor (LIQ), we follow Pastor and Stambaugh (2003) and sort stocks based on their sensitivity to market liquidity. High liquidity stocks are those in the top 70 percent of liquidity beta, and small stocks are those in the bottom 30 percent. The liquidity factor is the equal-weighted average of the daily returns of the high minus low liquidity beta stocks. We compute the estimated idiosyncratic volatility using daily data on a monthly basis and average the monthly estimates across all months for each stock.

If stock classification increases investor recognition and improves diversification, its effect should be stronger among firms with higher idiosyncratic volatility. Table 3 reports the estimated idiosyncratic volatility of both Islamic and conventional stocks in the Saudi market, and tests of the differences of mean idiosyncratic risk between the two stock classes are reported for each estimation method. Islamic stocks report significantly lower idiosyncratic volatility than conventional stocks across all three model specifications. The differences in average idiosyncratic risk between Islamic and conventional stocks are 5.71 percent, 5.38 percent, and 6.67 percent using the Fama and French (1993), Carhart (1997), and Pastor and Stambaugh (2003) multi-factor models, which account for 18.7%, 19.4%, and 28.9% of the average Islamic stock idiosyncratic volatility, respectively. The differences are statistically significant at the 5 percent level of significance or better across all specifications.

[Insert Table 3 here]

Next, we examine, in a multivariate framework, whether firm characteristics explain the reported difference in idiosyncratic volatility, or whether it is explained by *Sharia* stock classification. Following Ferreira and Laux (2007), we conduct regression tests using the logistic transformation of idiosyncratic volatility computed as:

$$\Psi_{i,t} = \ln \left(\frac{\sigma_{i\varepsilon,t}^2}{\sigma_{it}^2 - \sigma_{i\varepsilon,t}^2} \right) \quad (2d)$$

where σ_{it}^2 is total return volatility of stock i during month t , and $\sigma_{i\varepsilon,t}^2$ is the idiosyncratic volatility of stock i in month t . Similar to Ferreira and Laux (2007), we test the impact of firm characteristics on firm idiosyncratic volatility by estimating the following cross-sectional regression for each month:

$$\begin{aligned} \Psi_{i,t} = & \alpha_t + \beta_{1t} \text{Islamic} + \beta_{2t} \text{Log(Size)} + \beta_{3t} \text{BM} + \beta_{4t} \text{ROA} + \beta_{4t} \text{VROA} + \beta_{5t} \text{DD} + \\ & \beta_{6t} \text{Log(Age)} + \beta_{7t} \text{Invp} + \beta_{8t} \text{Analyst} + \beta_{9t} \text{Leverge} + \beta_{10t} \text{Log(Investors)} + \varepsilon_{i,t} \end{aligned} \quad (2e)$$

where $\Psi_{i,t}$ is the logistic transform of relative idiosyncratic volatility, computed from models (2a) – (2c), *Islamic* is a dummy variable equal to unity if the firm is classified as Islamic and zero otherwise, *Size* is firm market capitalization, *BM* is the firm's book-to-market ratio, *ROA* is the firm's return on assets,

VROA is the firm's quarterly ROA volatility during the past three years, *DD* is a dividend payer dummy variable equal to unity if the firm paid a dividend during the year and zero otherwise, *Age* is the number of months the stock is available in our data, *Invp* is the inverse of the share price, *Analyst* is the number of analysts covering the stock, *Leverage* is the firm's debt-to-assets ratio, and *Investors* is the total number of investors holding stock *i* at the end of month *t*. We also control for industry fixed effects.

Table 4 presents three specifications of the monthly cross-sectional regression of Eq. (2e). We calculate the time series averages of the coefficient estimates and adjust the standard errors for autocorrelation using the Newey and West (1987) approach with twelve lags. The results report a significant negative relationship between idiosyncratic volatility and firm *Sharia* classification. In specification (1), for each multi-factor model, for example, the regression coefficients of the Islamic dummy variable range between -0.15 and -0.17, and it is statically significant at the 1 percent level. This suggests that, independent of any changes in other firm characteristics, Islamic stocks, on average, have 15 percent to 17 percent lower idiosyncratic volatility, compared to their conventional counterparts. Similar inferences can be drawn from specifications (2) and (3), which control for leverage and the number of investors, respectively; the estimated Islamic coefficients are between -0.04 and -0.07, and the results are significant at the ten percent level or better for specification (3).

[Insert Table 4 here]

The results presented in Tables 2, 3, and 4 indicate that Islamic stocks are held by a broader investor base than conventional stocks, and this is consistent with our hypothesis that Islamic stocks are better recognized in the Saudi market, because they are traded by all types of investors, Islamic and conventional. In addition, conventional stocks, as indicated by their high level of idiosyncratic risk, are held by a narrower base of investors in the Saudi market. The difference in reported idiosyncratic risk between Islamic and conventional Saudi stocks also suggests that conventional stocks suffer from isolation, and supports our hypotheses of market segmentation through the mechanism of *Sharia* classification. Conventional stocks are traded by fewer investors, because they are restricted from being traded by Islamic investors, which leads to conventional stocks being segmented and isolated from

Islamic stocks. As a consequence, idiosyncratic volatility is priced, so conventional stocks must compensate their investors in the form of an additional risk premium along the lines proposed by Errunza and Losq (1985).

5.3. Information segmentation and stock synchronicity

In this section, we examine whether *Sharia* stock classification creates an information barrier between the two stock classes in a manner similar to that between two different equity markets. Morck et al. (2000) suggest that limitations on informed arbitrage may explain the differences in return synchronicity between international equity markets. We expect that the limitation on Islamic investors to trade only in *Sharia*-compliant stocks creates a barrier between the two classes of stocks, Islamic and conventional, that leads the synchronicity of stock returns with local and global economic factors to differ across the two classes. We also propose that Islamic investors share many common experiences and cultural perspectives that cause them to gather and process information in a similar manner; therefore, Islamic investors may arrive at similar investment decisions, which can lead to convergence in stock selections and portfolio allocation decisions. Eun et al. (2015) suggest that culture influences stock price synchronicity by affecting a country's information environment and correlations in investor trading activities.

Accordingly, we examine whether Islamic and conventional stocks in the Saudi market appear to be informationally segmented. We follow Morck et al. (2000) and Pukthuanthong and Roll (2009) by using the R-squared statistic from regressing individual stock returns on local and global macroeconomic factors as a measure of stock synchronicity and integration with other stocks in the market. If Islamic and conventional stocks have R-squared statistics, or synchronicity, that is not statistically different, we can say that they are informationally integrated, and there are no information limitations or barriers to trade. On the other hand, if Islamic and conventional stocks are driven by different global and local economic factors, measured by significantly different R-squared statistics, we conclude that they are informationally segmented. In addition, high R-squared statistics imply that more information regarding local or global economic factors is incorporated into the stock prices of that asset class.

As a test of Saudi stock local synchronicity, we use monthly macroeconomic factors that are available in the International Monetary Fund database for the Saudi Arabian economy. We follow the methodology of Pukthuanthong and Roll (2009) and extract the first eight principal components, [of the 67 macroeconomic factors that are available](#), which represent nearly 65% of the total return variation, ~~from the monthly returns of 67 macroeconomic factors that are available~~ and use them as the local factors to estimate the following model:

$$R_{i,t} = \alpha_i + \beta_{1i} PC_{1,t} + \beta_{2i} PC_{2,t} + \dots + \beta_{8i} PC_{8,t} + \varepsilon_{i,t} \quad (3a)$$

where $R_{i,t}$ is the monthly return for stock i ~~for~~ month t , and $PC_{1,t} - PC_{8,t}$ are the first to eighth [local macroeconomic](#) principal components for month t .

In testing Saudi stock global synchronicity, we use the S&P500 monthly index returns, because this index represents the value-weighted portfolio of the largest companies in the world's largest equity market. In addition, the local currency of Saudi Arabia is pegged to the U.S. dollar at a fixed exchange rate. Since almost 90 percent of Saudi government revenues come from oil exports, we use Brent oil monthly spot returns as another global factor that determines future government expenditures and Saudi economic performance. To account for global market sentiments and future expectations, we also use the Morgan Stanley Capital International (MSCI) emerging markets index monthly returns. We then regress each individual Saudi stock's monthly returns on these global factors separately and collectively using the following regression model:

$$R_{i,t} = \alpha_i + \beta_{Si} S\&P500_t + \beta_{Bi} Brent_t + \beta_{Mi} MSCI_t + \varepsilon_{i,t} \quad (3b)$$

where $R_{i,t}$ is the monthly return for stock i ~~for~~ month t , and $S\&P500_t$, $Brent_t$, and $MSCI_t$ are the monthly returns of the corresponding factor for month t , as previously defined.

Table 5 reports the synchronicity of Saudi Islamic and conventional stocks with local and global economic factors. In order to be included in this regression analysis, we require the stock ~~to~~ have at least 24 months of available return data. The estimates reported in Panel A of [Table 5](#) are the average R-squared values for each class of stocks and for all stocks in the market. The results show that Islamic

stocks are more synchronized and informationally integrated with the global and local economic factors, compared to conventional Saudi stocks. For example, Islamic stocks have an average R-squared value from local factors of 18.29 percent, which is 41 percent higher than that for conventional stocks of 12.95 percent. The difference in local synchronicity between Islamic and conventional stocks is 5.34 percentage points, which is statically significant at the one percent level. In terms of global integration, the average R-squared value for Islamic stocks is 14.17 percent, which is 26 percent higher than that for conventional stocks of 11.21 percent. The difference in R-squared values from global factors between Islamic and conventional stocks equals 2.96 percentage points and is statically significant at the 5 percent level.

[Insert Table 5 here]

In Table 5, we also investigate the source of synchronicity and information integration of individual Saudi stocks with local and global market factors. We perform a multivariate analysis to determine whether synchronicity is related to *Sharia* stock classification, or other firm characteristics. Specifically, we conduct a cross-sectional regression and regress the individual stock R-squared estimated from equations (3a) and (3b) on an Islamic dummy variable and other control variables to determine whether stock classification explains stock synchronicity⁵. Since R-squared measures are bounded between zero and one, we follow Morck et al. (2000) and apply the logistic transform:

$$\theta_{i,t} = \ln \left(\frac{R_{i,t}^2}{1-R_{i,t}^2} \right) \quad (3c)$$

We then run the cross-sectional regressions of the following form:

$$\begin{aligned} \theta_{i,t} = & \alpha_t + \beta_{1t} \text{Islamic} + \beta_{2t} \text{Log(Size)} + \beta_{3t} \text{BM} + \beta_{4t} \text{ROA} + \beta_{4t} \text{VROA} + \beta_{5t} \text{DD} + \\ & \beta_{6t} \text{Log(Age)} + \beta_{7t} \text{Analyst} + \beta_{9t} \text{Leverge} + \beta_{10t} \text{Log(Investors)} + \varepsilon_{i,t} \end{aligned} \quad (3d)$$

where $\theta_{i,t}$ is the logistic transform of the R-squared statistic computed from the estimation of either equation (3a) or (3b), *Islamic* is a dummy variable equal to one if the firm is classified as Islamic and zero otherwise, *Size* is firm market capitalization, *BM* is the firm's book-to-market ratio, *ROA* is the firm's return on assets, *VROA* is the firm's quarterly ROA volatility over the previous three years, *DD* is a

⁵ Note that we add leverage as a control variable in columns (3) and (4). Stocks operating in the Banks & Financial Service and Insurance sectors are excluded from the regression, because their leverage ratio has no useful meaning.

dividend payer dummy variable equal to one if the firm paid a dividend during the year and zero otherwise, *Age* is the number of months the stock is available in our data, *Analyst* is the number of analysts covering the stock, *Leverage* is the firm's debt-to-assets ratio, and *Investors* is the total number of investors holding stock *i* at the end of month *t*. We also control for industry fixed effects.

The results in Panel B of table 5 show that there is a positive relationship between Islamic stock classification and the level of integration, or synchronicity, with global and local economic and market factors. The coefficients of the Islamic dummy variable are all positive and statistically significant at the five percent level or better. For example, in specification (1), Islamic stocks have global and local synchronicities that are higher than conventional stocks by 59 percent and 55 percent, respectively.

The results of the stock synchronicity analysis presented in this section suggest that Saudi Islamic stocks are more informationally integrated with global and local economic factors than conventional stocks. The openness of Islamic stocks to both Islamic and conventional investors increases and facilitates the dissemination of information among equity market participants, which results in high levels of synchronicity between stock returns and local and global economic factors. Conversely, the implicit barrier to entry, *Sharia* classification, isolates conventional stocks in this market, making information dissemination more difficult, and supporting the idea that conventional stocks are segmented in the Saudi market.

5.4. Stock visibility and investor familiarity

In the previous section, we show that stock return synchronicity with economic factors is significantly higher for Islamic stocks than conventional stocks. However, it is still unclear as to whether Islamic stocks are trading due to firm-specific, or market-wide, factors. In this section, we follow Loughran and Schultz (2005) and measure the difference in systematic and unsystematic turnover between Islamic and conventional stocks. Loughran and Schultz (2005) suggest that higher systematic turnover indicates higher stock visibility and investor familiarity. If the systematic component of turnover is larger for Islamic stocks, the implication is that investors trade Islamic stocks in response to market-wide or industry-wide information, which means that Islamic stocks are more visible, or are known to more

investors. Hence, Islamic stocks are more heavily traded when information that is relevant to numerous firms is revealed.

For each trading day over the 2002 to 2015 sample period, we estimate individual stock turnover, along with lag, lead, and contemporaneous market turnover. Market turnover is calculated by dividing the total number of shares traded on a specific day by the total number of shares outstanding for all listed stocks on that day. We run a regression every month for each stock of the form:

$$Turnover_{i,t} = \alpha_0 + \alpha_{1,i} Turnover_{m,t+1} + \alpha_{2,i} Turnover_{m,t} + \alpha_{3,i} Turnover_{m,t-1} + \varepsilon_{i,t}, \quad (4a)$$

where $Turnover_{i,t}$ is the turnover of stock i on day t , and $Turnover_{m,t}$ is the market turnover on day t .

To obtain the systematic turnover for stock i on day t , we multiply the coefficients by the average contemporaneous, lagged, and lead market turnovers. The unsystematic turnover is, therefore, measured by the intercept coefficient. We average the estimates over the cross-section for each month and across months and adjust standard errors for serial autocorrelation using the Newey and West (1987) approach with twelve lags. Results are reported in Table 6.

[Insert Table 6 here]

Table 6 reports the average systematic and unsystematic turnovers for Islamic and conventional stocks. For conventional stocks, systematic turnover represents only 3.04 percent of the outstanding shares per day, while Islamic stocks have a systematic turnover that equals 4.0 percent of outstanding shares per day. The difference in systematic turnover between Islamic and conventional stocks of 0.96 percentage points is statically significant at the one percent level. Unsystematic turnover, on the other hand, is lower for Islamic stocks than for conventional stocks. The average unsystematic turnover for Islamic stocks is only 0.33 percent, and it is statically insignificant, compared to a statically significant unsystematic turnover of 0.98 percent for conventional Saudi stocks. The difference between the two classes of 0.65 percentage points is significant at the one percent level.

The results reported in Table 6 imply that the greater turnover of Islamic stocks comes completely from systematic turnover. That is, when investors trade stocks for market wide reasons, they trade Islamic stocks. This finding supports that familiarity is an important criterion in determining

trading. If investors trade in response to information that concerns a particular stock, they are inclined to trade that stock. On the other hand, if investors can trade a number of different stocks in response to information with market-wide ramifications, they trade the stocks that they are familiar with, and more investors are familiar with Islamic stocks in the Saudi market.

To verify that the differences in systematic and unsystematic turnover are driven by *Sharia* classification, rather than factors that are correlated with this classification, we regress our estimates of systematic and unsystematic turnover for each stock on an Islamic classification dummy variable, among other firm characteristics. Specifically, we run the following cross-sectional regression:

$$\gamma_{i,t} = \alpha_t + \beta_{1t} \text{Islamic} + \beta_{2t} \text{Log(Size)} + \beta_{3t} \text{BM} + \beta_{4t} \text{ROA} + \beta_{5t} \text{DD} + \beta_{6t} \text{Log(Age)} + \beta_{7t} \text{Invp} + \beta_{8t} \log(RV) + \beta_{9t} \text{Analyst} + \beta_{10t} \text{Log(Investors)} + \varepsilon_{i,t} \quad (4b)$$

where $\gamma_{i,t}$ is either systematic turnover, unsystematic turnover, or the coefficient on contemporaneous market turnover, *Islamic* is a dummy variable equal to one if the firm is classified as Islamic and zero otherwise, *Size* is firm market capitalization, *BM* is the firm's book-to-market ratio, *ROA* is the firm's return on assets, *DD* is a dividend payer dummy variable equal to one if the firm paid a dividend during the year and zero otherwise, *Age* is the number of months the stock is available in our data, *Invp* is the inverse of share price, *Analyst* is the number of analysts covering the stock, and *Investors* is the total number of investors holding stock *i* at the end of month *t*. We also control for industry fixed effects. The average [monthly](#) regression coefficients⁶ are reported in Table 7. Fama-MacBeth t-statistics are calculated using the Newey and West (1987) approach with twelve lags.

[Insert Table 7 here]

Model specification (1) of Table 7 shows that Islamic stocks have higher systematic turnover, greater sensitivity to same-day market turnover, and lower unsystematic turnover than their conventional [counterparts](#). The coefficients for the Islamic dummy coefficient are economically and statistically significant for specification (1). However, when we control for visibility variables, like

⁶ The number of regressions in table 7 depends on data availability. The number of analysts is only available from 2005 in the I/B/E/S database, and Tadawul provides the number of investors only after January 2010.

analyst coverage and the number of investors, in columns (2) and (3), the difference between Islamic and conventional stocks in terms of systematic and unsystematic turnover and [the](#) sensitivity to same-day market turnover become economically and statically insignificant. These results indicate that *Sharia* stock classification increases stock familiarity and visibility to potential investors, consistent with the investor recognition created by Islamic *Sharia* stock screening. In addition, [this effect is only weakened by the impacts of increased analyst coverage and a broader investor base, which may indicate that these measures also](#) ~~is~~ send important signals to Islamic investors.

5.5. Stock liquidity and trading

In the previous sections, we show that Islamic stocks are more visible, are recognized by a wider base of equity market participants, and have a broader investor base in the Saudi market. Our results suggest that Islamic stocks attract a disproportionate number of investors who make their investment decisions based on familiarity, rather than on more fundamental information. An implication of this is that *Sharia* classification may affect stock market liquidity through its effect on the composition of traders. Thus, it is plausible that a firm's *Sharia* classification reduces adverse selection costs by increasing the proportion of such uninformed traders in the market for the firm's stock. Grullon et al. (2004) argue that uninformed investors cluster around high-visibility stocks, because those are the ones in which they are aware of, and because these investors often mistake their knowledge of a firm for relevant information. Therefore, discretionary liquidity traders will target high-visibility stocks, because they can hide their trades among other uninformed investors. Following this reasoning, we expect Islamic stocks to have higher liquidity than their conventional counterparts.

Accordingly, in this section, we investigate the predictive relationship between *Sharia* stock classification, stock turnover, and relative price impact, measured by Amihud's (2002) illiquidity measure *ILLIQ*, calculated as the daily ratio of absolute stock return to dollar trading volume. We also use the modified version of this illiquidity measure proposed by Amihud et al. (2015), estimated as the ratio of *ILLIQ* to the average *ILLIQ* of all stocks in the market. Rather than computing dollar trading volume, we use the reported actual trading values reported in the data provided by the Tadawul exchange. Using a

multivariate framework that controls for other factors that may affect liquidity, we run the following daily cross-sectional regression model and control for the variables suggested by Grullon et al. (2004):

$$\tau_{i,t} = \alpha_t + \beta_{1t} \text{Islamic} + \beta_{2t} \text{Log(Size)} + \beta_{3t} \text{ROA} + \beta_{4t} \text{Log(Age)} + \beta_{5t} \text{Log(RV)} + \beta_{6t} \text{Invp} + \beta_{7t} \text{Log(Turnover)} + \varepsilon_{i,t} \quad (5)$$

where $\tau_{i,t}$ is either the stock turnover ratio, *ILLIQ*, or *ILLIQMA*. *Islamic* is a dummy variable that equals one if the firm is classified as Islamic and zero otherwise, *Size* is firm market capitalization, *ROA* is the firm's return on assets, *Age* is number of months the stock is available in our data, *RV* is the daily stock return volatility over the past month, *Invp* is the inverse of share price, and *Turnover* is stock turnover over the past month. We also control for industry fixed effects.

Table 8 presents the results from the multivariate analysis testing the relationship between Islamic classification and firm liquidity and trading. We calculate the time-series average of the coefficient estimates across the daily ~~the~~ cross-sectional regressions. To control for serial correlation in the coefficient time series, we compute Newey-West (1987) standard errors with twenty lags. Consistent with our prediction, Islamic stocks have higher liquidity than conventional stocks in the Saudi market. When using the *ILLIQ* and *ILLIQMA* measures of liquidity, for example, the Islamic dummy coefficient is consistently negative and statistically significant across both model specifications, which indicates that Islamic stocks have lower illiquidity, or higher liquidity, than their conventional counterparts. The same conclusion can be drawn using stock turnover as the dependent variable; stocks that have been classified as *Sharia* compliant have stock turnover ratios that are higher than those of non-complaint stocks.

[Insert Table 8 here]

The results reported in this section suggest that *Sharia* stock classification increases Islamic stock visibility and investor recognition, due to the fact that Islamic stocks are acceptable to both Islamic and conventional investors in the Saudi market. As a result, Islamic firms exhibit greater turnover and improved liquidity, as compared to conventional stocks. Furthermore, the wide acceptance and increased firm visibility of Islamic stocks in this market leads to the clustering of uninformed investors in these

stocks. These investors trade based on their awareness of a firm, rather than relevant information. Thus, liquidity traders will find it optimal to trade Islamic stocks, which are highly visible, in order to hide their trades among uninformed investors. Our results confirm this prediction and show that Islamic stocks are more actively traded and more liquid than conventional stocks. The multivariate analysis indicates that, after controlling for other firm characteristics known to affect liquidity and trading activity, firm *Sharia* compliance increases investor recognition of Islamic stocks and results in a positive impact on stock liquidity and trading activity.

6. Robustness checks

We now summarize several un-tabulated robustness checks that do not alter the main inferences of our study. Firstly, we ensure that our results are not subject to the *Sharia* classification system selected for our analyses. Accordingly, we use an alternative *Sharia* stock classification, that of Dr. Al-Osaimi, and the estimated results are similar to those reported in our study; ~~and~~ our conclusions remain unchanged. It is possible that, even if we use another *Sharia* classification, our results are still driven by fundamental-related *Sharia* classification criteria, such as firm's debt ratios. To address this issue, we select stocks that are Islamic by default and whose compliance with *Sharia*-roles are determined by their business operation and not by their leverage-level. Typically, firms that operate in the Banks & Financial Service or Insurance sectors decide whether or not to comply with *Sharia* roles early on, ~~when-as~~ they first establish their business and set compliance standards. Once these firms commit to comply with *Sharia* standards, it is not possible to abandon their commitment. Therefore, investors will perceive those firms as truly Islamic and there will be no doubt about their classification. ~~Accordingly, We-we~~ examine the effect of firm compliance with *Sharia*-roles on the stock visibility and liquidity ~~in-of~~ firms operating in the Banks & Financial Service and Insurance sectors. Table 9 presents the results of regressing stock visibility and liquidity measures within the Banks & Financial Service and Insurance sectors on our Islamic dummy variable and other control variables. The results are consistent with our prediction that Islamic stocks are more visible and liquid, and they are owned by a larger number of investors, as indicated by the positive and statically significant coefficients on the Islamic dummy variable for the

stock synchronicity and liquidity regressions. These selected Islamic stocks also have higher investor recognition than their conventional counterparts, as indicated by the negative and statistically significant coefficient on [the](#) Islamic dummy variable for the idiosyncratic volatility regression. Based on several robustness tests described in this section, we estimate that the results presented in this study are not an artifact of the method used to determine *Sharia*, or Islamic, classification.

[Insert Table 9 here]

7. Conclusion

Our objective is to examine the potential impact of market barriers created by implicit, cultural, or philosophical differences among economic agents by studying how Islamic religious restrictions affect stock visibility and investor recognition in Saudi Arabia. We examine the performance of Islamic and conventional stocks in terms of ownership base, information integration, liquidity, and trading activity and determine whether the *Sharia* classification of Saudi stocks creates differences between Islamic and conventional stocks that can be attributed to investor recognition, an implicit trading barrier that segments these two asset classes, or a combination of these effects. Due to the religious nature of the population, the degree to which individuals participate in the stock market, and the recent growth in the listed firms available for purchase in the stock market, the Saudi Arabian stock market provides an ideal sample for our analysis. Accordingly, we examine the daily and monthly stock data of all Saudi firms from 2002 to 2015 and calculate important measures pertaining to the breadth of ownership, investor recognition, visibility, synchronicity, information integration, and stock liquidity of these firms. Specifically, we compute the degree of market integration and synchronicity along the lines of Pukthuanthong and Roll (2009), the degree of stock recognition based on Merton's (1987) framework, and the degree of stock visibility and investor familiarity along the lines of Loughran and Schultz (2005).

Our results support the segmentation and impediment-to-trade hypothesis. Conventional stocks are isolated and segmented from Islamic stocks in the Saudi market, which means that there exists an implicit barrier to trade between them, namely religious classification. By applying a methodology similar to Pukthuanthong and Roll (2009) to measure stock synchronicity and information integration, we find

that local and global macroeconomic factors can better explain Islamic stock returns than conventional stock returns in the Saudi market.

In addition, we also report evidence supporting the hypothesis that *Sharia* certification generates an investor recognition effect similar to that found in the literature surrounding other information signals. Our results indicate that Islamic stocks exhibit higher liquidity and more [frequent](#) trading activity than conventional stocks. We find that Islamic stocks are traded around 25 percent more frequently than conventional stocks in terms of stock turnover. In addition, according to Amihud's (2002) illiquidity measure, Islamic stocks are 24 percent more liquid than their conventional counterparts. In addition, we identify the type of information conveyed through the relatively higher frequency trades of Islamic stocks using a methodology similar to that of Loughran and Schultz (2005). The results imply that the higher turnover for Islamic stocks comes completely from systematic turnover. That is, when investors trade stocks for market-wide reasons, they trade Islamic stocks. This finding supports that familiarity is an important criterion in determining trading. If investors trade in response to information that concerns a particular stock, they must trade that stock. On the other hand, if investors can trade a number of different stocks in response to information with market-wide ramifications, they choose to trade the stocks that they are familiar with, and Saudi investors are more familiar with Islamic stocks, due to their *Sharia* certification.

One important implication of the segmentation and low visibility surrounding conventional stocks in the Saudi market is that investors who invest in conventional securities may require a return “super premium,”⁵ because they must bear some idiosyncratic risk. To test this implication, we follow Ang et al. (2006) and estimate firm idiosyncratic volatility as the standard deviation of abnormal stock returns, relative to multi-factor asset-pricing models. The results show that Islamic stocks exhibit lower idiosyncratic risk than conventional stocks, an indication that these firms experience better market integration and visibility due to *Sharia* classification screening.

To our knowledge, this is the first paper to discuss the performance, liquidity, and trading activity differences between Islamic and conventional stocks in the context of market segmentation and investor

recognition. Our results imply that *Sharia* certification has the effect of segmenting the Saudi markets, as well as improving the liquidity and investor recognition of Islamic stocks for Saudi Islamic investors. Therefore, the results presented have important implications as to the efficiency of asset pricing, not only in emerging markets, such as Saudi Arabia, but also in economies with significant Islamic financial markets. Furthermore, our results may provide value to a new line of literature that examines other implicit market barriers, such as those due to other cultural or philosophical differences, and their impact on the efficiency of financial markets throughout the world.

References

- Abbes, M.B. and Trichilli, Y., 2015. Islamic stock markets and potential diversification benefits. *Borsa Istanbul Review*, 15(2), pp.93-105.
- Ahmad, Z. and Ibrahim, H., 2002. A study of performance of the KLSE Syariah index. *Malaysian Management Journal*, 6(1&2), pp.25-34.
- Alam, N. and Rajjaque, M.S., 2010. Shariah-compliant equities: Empirical evaluation of performance in the European market during credit crunch. *Journal of Financial Services Marketing*, 15(3), pp.228-240.
- Ashraf, D. and Mohammad, N., 2014. Matching perception with the reality—Performance of Islamic equity investments. *Pacific-Basin Finance Journal*, 28, pp.175-189.
- Amihud, Y., 2002. Illiquidity and stock returns: cross-section and time-series effects. *Journal of financial markets*, 5(1), pp.31-56.
- Amihud, Y., Hameed, A., Kang, W. and Zhang, H., 2015. The illiquidity premium: International evidence. *Journal of Financial Economics*, 117(2), pp.350-368.
- Ang, A., Hodrick, R.J., Xing, Y. and Zhang, X., 2006. The cross - section of volatility and expected returns. *The Journal of Finance*, 61(1), pp.259-299.
- Bailey, W., 1994. Risk and return on China's new stock markets: Some preliminary evidence. *Pacific-Basin Finance Journal*, 2(2), pp.243-260.
- Bailey, W., Chung, Y. and Kang, J., 1999. Foreign Ownership Restrictions and Equity Price Premiums: What Drives the Demand for Cross-Border Investments?. *The Journal of Financial and Quantitative Analysis*, 34(4), p. 489.
- Balcilar, M., Demirer, R. and Hammoudeh, S., 2015. Global risk exposures and industry diversification with Shariah-compliant equity sectors. *Pacific-Basin Finance Journal*, 35, pp.499-520.
- Bhatt, V. and Sultan, J., 2012. Leverage risk, financial crisis, and stock returns: A comparison among Islamic, conventional, and socially responsible stocks. *Islamic Economic Studies*, 20(1), pp.87-143.

- Bushee, B.J. and Miller, G.S., 2012. Investor relations, firm visibility, and investor following. *The Accounting Review*, 87(3), pp.867-897.
- Canepa, A. and Ibnrubbian, A., 2014. Does faith move stock markets? Evidence from Saudi Arabia. *The Quarterly Review of Economics and Finance*, 54(4), pp.538-550.
- Carhart, M.M., 1997. On persistence in mutual fund performance. *The Journal of Finance*, 52(1), pp.57-82.
- Charles, A., Darné, O. and Pop, A., 2015. Risk and ethical investment: Empirical evidence from Dow Jones Islamic indexes. *Research in International Business and Finance*, 35, pp.33-56.
- Chen, H., Noronha, G. and Singal, V., 2004. The price response to S&P 500 index additions and deletions: Evidence of asymmetry and a new explanation. *The Journal of Finance*, 59(4), pp.1901-1930.
- Dewandaru, G., Bacha, O.I., Masih, A.M.M. and Masih, R., 2015. Risk-return characteristics of Islamic equity indices: Multi-timescales analysis. *Journal of Multinational Financial Management*, 29, pp.115-138.
- Dewandaru, G., Rizvi, S.A.R., Masih, R., Masih, M. and Alhabshi, S.O., 2014. Stock market co-movements: Islamic versus conventional equity indices with multi-timescales analysis. *Economic Systems*, 38(4), pp.553-571.
- Dharani, M. and Natarajan, P., 2011. Equanimity of risk and return relationship between Shariah index and general index in India.
- Eun, C.S., Wang, L. and Xiao, S.C., 2015. Culture and R 2. *Journal of Financial Economics*, 115(2), pp.283-303.
- Errunza, V. and Losq, E., 1985. International asset pricing under mild segmentation: Theory and test. *The Journal of Finance*, 40(1), pp.105-124.
- Fama, E.F. and French, K.R., 1993. Common risk factors in the returns on stocks and bonds. *Journal of financial economics*, 33(1), pp.3-56.
- Fang, L. and Peress, J., 2009. Media coverage and the cross - section of stock returns. *The Journal of Finance*, 64(5), pp.2023-2052.
- Ferreira, M.A. and Laux, P.A., 2007. Corporate governance, idiosyncratic risk, and information flow. *The Journal of Finance*, 62(2), pp.951-989.
- Foerster, S.R. and Karolyi, G.A., 1999. The effects of market segmentation and investor recognition on asset prices: Evidence from foreign stocks listing in the United States. *The Journal of Finance*, 54(3), pp.981-1013.
- Geczy, C., Stambaugh, R.F. and Levin, D., 2005. Investing in socially responsible mutual funds.
- Girard, E.C. and Hassan, M.K., 2008. Is there a cost to faith-based investing: Evidence from FTSE Islamic indices. *The Journal of Investing*, 17(4), pp.112-121.

- Grullon, G., Kanatas, G. and Weston, J.P., 2004. Advertising, breadth of ownership, and liquidity. *Review of Financial Studies*, 17(2), pp.439-461.
- Hammoudeh, S., Mensi, W., Reboredo, J.C. and Nguyen, D.K., 2014. Dynamic dependence of the global Islamic equity index with global conventional equity market indices and risk factors. *Pacific-Basin Finance Journal*, 30, pp.189-206.
- Heinkel, R., Kraus, A. and Zechner, J., 2001. The effect of green investment on corporate behavior. *Journal of financial and quantitative analysis*, 36(04), pp.431-449.
- Hoepner, A.G., Rammal, H.G. and Rezec, M., 2011. Islamic mutual funds' financial performance and international investment style: Evidence from 20 countries. *The European Journal of Finance*, 17(9-10), pp.829-850.
- Hong, H. and Kacperczyk, M., 2009. The price of sin: The effects of social norms on markets. *Journal of Financial Economics*, 93(1), pp.15-36.
- Hong, H. and Kostovetsky, L., 2012. Red and blue investing: Values and finance. *Journal of Financial Economics*, 103(1), pp.1-19.
- Irvine, P.J., 2003. The incremental impact of analyst initiation of coverage. *Journal of Corporate Finance*, 9(4), pp.431-451.
- Kadlec, G.B. and McConnell, J.J., 1994. The effect of market segmentation and illiquidity on asset prices: Evidence from exchange listings. *The Journal of Finance*, 49(2), pp.611-636.
- Kumar, A., Page, J.K. and Spalt, O.G., 2011. Religious beliefs, gambling attitudes, and financial market outcomes. *Journal of Financial Economics*, 102(3), pp.671-708.
- Lee, H.W., 2009. The Price Premium of China A - Shares over Hong Kong H - Shares: A Further Visit of the Liquidity Hypothesis. *Asia - Pacific Journal of Financial Studies*, 38(5), pp.657-694.
- Loughran, T. and Schultz, P., 2005. Liquidity: Urban versus rural firms. *Journal of Financial Economics*, 78(2), pp.341-374.
- Majdoub, J. and Mansour, W., 2014. Islamic equity market integration and volatility spillover between emerging and US stock markets. *The North American Journal of Economics and Finance*, 29, pp.452-470.
- Mensi, W., Hammoudeh, S., Reboredo, J.C. and Nguyen, D.K., 2015. Are Sharia stocks, gold and US Treasury hedges and/or safe havens for the oil-based GCC markets?. *Emerging Markets Review*, 24, pp.101-121.
- Merdad, H.J., Hassan, M.K. and Hippler, W.J., 2015. The Islamic risk factor in expected stock returns: an empirical study in Saudi Arabia. *Pacific-Basin Finance Journal*, 34, pp.293-314.
- Merton, R.C., 1987. A simple model of capital market equilibrium with incomplete information. *The journal of finance*, 42(3), pp.483-510.
- Morck, R., Yeung, B. and Yu, W., 2000. The information content of stock markets: why do emerging markets have synchronous stock price movements?. *Journal of financial economics*, 58(1), pp.215-260.

Naifar, N., 2016. Do global risk factors and macroeconomic conditions affect global Islamic index dynamics? A quantile regression approach. *The Quarterly Review of Economics and Finance*, 61, pp.29-39.

Saiti, B., Bacha, O.I. and Masih, M., 2014. The diversification benefits from Islamic investment during the financial turmoil: The case for the US-based equity investors. *Borsa Istanbul Review*, 14(4), pp.196-211.

Shamsuddin, A., 2014. Are Dow Jones Islamic equity indices exposed to interest rate risk?. *Economic Modelling*, 39, pp.273-281.

Shleifer, A., 1986. Do demand curves for stocks slope down?. *The Journal of Finance*, 41(3), pp.579-590.

Pástor, L. and Stambaugh, R.F., 2003. Liquidity risk and expected stock returns. *Journal of Political economy*, 111(3), pp.642-685.

Pukthuanthong, K. and Roll, R., 2009. Global market integration: An alternative measure and its application. *Journal of Financial Economics*, 94(2), pp.214-232.

Wahyudi, I. and Sani, G.A., 2014. Interdependence between Islamic capital market and money market: Evidence from Indonesia. *Borsa Istanbul Review*, 14(1), pp.32-47.

Walkshäusl, C. and Lobe, S., 2012. Islamic investing. *Review of Financial Economics*, 21(2), pp.53-62.

Yilmaz, M.K., Sensoy, A., Ozturk, K. and Hacıhasanoglu, E., 2015. Cross-sectoral interactions in Islamic equity markets. *Pacific-Basin Finance Journal*, 32, pp.1-20.

Figure 1: Islamic And Conventional stocks distributions across market sectors

The industries are as follows: 1: Banks & Financial Services, 2:Petrochemical Industries 3:Cement, 4:Retail, 5:Energy, & Utilities, 6:Agriculture & Food Industries, 7:Telecommunication & Information Technology, 8:Multi-Investment, 9:Industrial Investment, 10:Building & Construction, 11:Real Estate Development, 12:Transport, 13:Media and Publishing, 14:Hotel & Tourism, and 15:Insurance.

Table 1: Summary statistics

This table shows summary statistics for Saudi stocks during the period from 2002 to 2015 separated based on Al-Fozan's classification into Islamic and conventional stocks. "Size" is the market capitalization calculated as the stock closing price at the end of the year times the number of shares outstanding, "BM" firm quarterly Book-to-market ratio, "Leverage" firm quarterly debt to assets ratio, "ROA" firm quarterly return on assets, "VROA" is firm quarterly ROA volatility over the past 3 years, "Firm Age" is the number of months since the stock is available in our data, "Dividends dummy" is a dummy variable that equal one if the firm pay dividends, zero otherwise, "Turnover" stock daily trading volume over total shares outstanding, "ILLIQ" stock daily Amihud's (2002) illiquidity, "ILLIQMA" stock daily Amihud's illiquidity relative to the market average, stock "Closing price", stock "Daily returns", stock daily "Return volatility" during the month, "Momentum" is the average monthly returns during the past six months "Number of analyst", "Number of investors" reported at the end of each month, and "Number of firms" in each class every year.

Variable	Islamic firms					Conventional firms				
	Mean	Median	Std. Dev.	Min	Max	Mean	Median	Std. Dev.	Min	Max
Size	6,062	1,887	14,789	212	115,230	12,200	1,490	35,932	136	365,094
BM	0.57	0.50	0.34	0.08	2.60	0.58	0.51	0.33	0.08	3.55
Leverage	16.1%	9.1%	17.0%	0.0%	58.4%	27.5%	25.9%	20.5%	0.0%	65.8%
ROA	6.0%	6.1%	10.4%	-77.5%	38.5%	2.3%	2.1%	8.4%	-131.0%	47.1%
VROA	0.027%	0.009%	0.046%	0.000%	0.340%	0.026%	0.007%	0.047%	0.000%	0.355%
Firm Age	83.36	81.00	48.61	1.00	162.50	76.64	70.50	43.79	1.00	162.50
Dividend dummy	0.42	0.00	0.49	0.00	1.00	0.36	0.00	0.48	0.00	1.00
Turnover	3.4%	0.8%	8.0%	0.0%	39.8%	3.9%	1.0%	9.2%	0.0%	44.2%
ILLIQ	0.223	0.05	0.732	0.00	6.13	0.352	0.05	1.52	0.00	13.00
ILLIQMA	0.93	0.42	2.25	0.00	7.50	1.04	0.39	3.11	0.00	10.66
Closing price	38.26	29.64	27.67	5.35	142.00	32.36	26.61	20.51	3.75	134.25
Daily returns	0.04%	0.03%	2.55%	-9.34%	9.60%	0.06%	0.04%	2.99%	-9.76%	9.86%
Return volatility	0.065%	0.080%	0.042%	0.003%	0.423%	0.090%	0.102%	0.056%	0.005%	0.510%
Monthly Momentum	1.35%	0.71%	8.03%	-22.36%	396.24%	1.91%	0.99%	9.16%	-58.94%	352.73%
Number of analysts	1.42	0.00	2.80	0.00	19.00	1.27	0.00	2.83	0.00	15.00
Number of investors	62,760	22,788	106,649	1,849	699,437	56,251	20,530	93,853	2,054	608,361
Number of Firms	70	64	13	28	89	83	83	4	77	89

Table 2: Breadth of ownership

In the regressions, the dependent variable is the log of number of investors for firm i at the end of the month t . Explanatory variables are an Islamic dummy variable which equals to one if the firm is classified as Islamic and zero otherwise, “**Size**” is the natural log of firm market value, “**ROA**” firm return on assets, “**Age**” is the number of month since the firm appears in our data, “**Momentum**” is the average stock monthly return for the last six months, “**RV**” is daily stock return volatility over the past month, “**1/p**” is the inverse of share price, “**Turnover**” is the stock monthly turnover for the past month calculated as the ratio of traded stock volume over firm total shares outstanding, and “**DD**” is a dummy variable that equals one if the firm pay dividends and zero otherwise. We also control for industry by including a dummy variable for each industry. The cross-sectional regressions weight each day equally. The parameter values are the average of the monthly cross-sectional regressions. In parentheses are the Fama–MacBeth t -statistics calculated using Newey–West corrected standard errors. Intercepts and coefficients on the industry dummies are not reported to save space.

	Log (Number of investors)		
	(1)	(2)	(3)
Islamic dummy	0.17^b (2.95)	0.15^c (2.59)	0.15^c (2.38)
Size	0.36^a (39.10)	0.40^a (27.67)	0.41^a (30.64)
ROA	-0.93^a (-4.57)	-0.84^a (-4.12)	-0.68^c (-2.53)
Log (Age)	-0.95^a (-18.97)	-0.97^a (-18.65)	-0.95^a (-17.20)
Momentum	0.64 (1.02)	0.57 (0.87)	0.52 (0.78)
Log (RV)	0.07 (1.81)	0.06 (1.69)	0.06 (1.45)
1/p	18.77^a (11.61)	18.58^a (11.65)	18.02^a (13.53)
Log (Turnover)		0.06^a (5.76)	0.06^a (5.23)
DD			-0.15 (-1.64)
R-squared	0.54	0.54	0.55
Number of obs.	72	72	72

(a) significant at 1% , (b) significant at 5% and (c) significant at 10%

Table 3: stock Idiosyncratic volatility

This table reports average coefficients and Idiosyncratic volatility from monthly stock-level time-series regressions of daily firm returns Using Fama-French (1993) three-factor , Carhart (1997) four-factor, and Pastor and Stamaugh (2003) liquidity models. We report average coefficients for Islamic, conventional, and all stocks in the market. We average the coefficients cross-sectionally in each month and then across months. In parentheses are the Fama–MacBeth t-statistics calculated using Newey–West corrected standard errors. The sample period is from 2002 to 2015.

	FF Three-Factor			Carhart Four-Factor			PS Liquidity		
	Islamic	conventional	All	Islamic	Conventional	All	Islamic	Conventional	All
Intercept	-0.33* (-1.49)	-0.30* (-1.37)	-0.32* (-1.55)	-0.42* (-1.75)	-0.30* (-0.77)	-0.36* (-1.48)	-0.20* (-0.55)	-0.30* (-0.77)	-0.24* (-0.68)
Mkt	0.88^a (50.84)	0.95^a (58.70)	0.92^a (66.9)	0.89^a (59.55)	0.97^a (65.0)	0.92^a (71.8)	0.89^a (54.26)	0.97^a (65.0)	0.93^a (73.8)
SMB	0.44^a (11.84)	0.45^a (21.93)	0.45^a (18.17)	0.46^a (12.93)	0.48^a (52.6)	0.46^a (23.3)	0.40^a (12.33)	0.48^a (52.6)	0.44^a (24.6)
HML	0.11^a (4.81)	-0.03 (-1.80)	0.05^b (2.88)	0.12^a (4.95)	-0.02 (1.40)	0.05^b (3.26)	0.17^a (8.04)	-0.02 (1.40)	0.07^a (5.36)
UMD				-0.04 (-1.50)	-0.02 (1.40)	-0.04^c (-2.24)			
Liquidity							0.01 (0.37)	0.03 (1.5)	0.012^a (0.42)
R²	45.3%	46.4%	45.8%	50.6%	51.8%	51.2%	49.8%	52.0%	50.9%
IV	30.6%	36.3%	33.4%	27.7%	30.1%	30.3%	23.1%	29.8%	26.4%
Difference in IV		5.71%^b (2.57)			5.38%^b (3.30)			6.67%^a (3.30)	

* numbers are multiplied by 1000

(a) significant at 1% , (b) significant at 5% and (c) significant at 10%

Table 4: Cross-sectional regressions of idiosyncratic volatility

The table reports Fama-MacBeth (1973) cross-sectional regression estimates, where the dependent variable is firm idiosyncratic volatility measured using monthly regression of firm daily stock returns using three different models. Independent variables are Islamic dummy variable that equals one if the firm is classified as Islamic and zero otherwise, “Size” is the natural log of firm market value, “B/M” Book-to-market ratio, “ROA” firm return on assets, “VROA” is firm quarterly ROA volatility over the past 3 years, “DD” is a dummy variable that equals one if the firm pay dividends and zero otherwise, “Age” is the number of month since the firm appears in our data, “1/p” is the inverse of share price, Number of analyst, “Leverage” is firm debt to asset ratio and we put missing values for firms in Banks & Financial Service and Insurance sectors, and “Number of investors” which is the total number of investors for each firm at the end of the month (from Jan 2010 to Dec 2015). We average coefficients cross-sectionally each month and then across months. Intercepts and coefficients on the industry dummies are not reported to save space. In parentheses are the Fama–MacBeth t-statistics calculated using Newey–West corrected standard errors.

	FF Three-Factor			Carhart Four-Factor			PS Liquidity		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Islamic dummy	-0.15^a (4.4)	-0.04 (1.1)	-0.06^c (2.2)	-0.15^a (5.0)	-0.05 (1.5)	-0.07^a (3.5)	-0.17^a (3.5)	-0.04 (1.0)	-0.07^c (2.4)
Size	0.002 (0.1)	0.01 (0.5)	0.08^a (3.5)	-0.01 (-0.5)	-0.01 (-0.3)	0.06^b (3.3)	-0.05^c (-2.1)	-0.03^c (-2.0)	0.02 (1.3)
B/M	0.15 (1.9)	-0.03 (-0.3)	0.06 (0.7)	0.15^c (2.1)	-0.02 (-0.2)	0.07 (0.7)	0.20^c (2.4)	0.05 (0.8)	0.12 (1.3)
ROA	4.02^a (5.9)	4.09^a (5.2)	5.07^a (6.4)	4.11^a (6.0)	4.13^a (5.2)	5.25^a (7.0)	4.88^a (8.6)	5.02^a (7.5)	4.94^a (6.9)
VROA	-7.22 (-0.3)	46.15 (1.4)	-26.4 (-0.7)	-10.42 (-0.4)	42.54 (1.3)	-27.6 (-0.7)	0.94 (0.0)	43.12 (1.5)	-28.0 (-0.8)
DD	0.03 (1.3)	0.03 (1.1)	0.05 (1.9)	0.03 (1.7)	0.04 (1.6)	0.04 (1.8)	0.03 (1.3)	0.01 (0.7)	0.03 (1.3)
Log (Age)	-0.28^c (-2.2)	-0.34^a (-3.4)	-0.35^a (-5.6)	-0.28^c (-2.3)	-0.32^a (-3.5)	-0.32^a (-5.2)	-0.33^b (-3.3)	-0.30^a (-3.6)	-0.28^a (-5.5)
1/p	-6.16^a (-4.7)	-5.85^a (-4.0)	-4.46^b (-2.8)	-5.92^a (-4.0)	-5.73^a (-3.5)	-4.37^c (-2.5)	-6.08^a (-5.6)	-6.56^a (-4.3)	-5.52^b (-3.4)
# of analysts	-0.01 (-0.2)	-0.06^c (-2.1)	-0.04^a (-5.9)	0.00 (-0.1)	-0.05 (-1.7)	-0.04^a (-5.4)	-0.05^c (-2.3)	-0.16 (-1.8)	-0.03^a (-3.7)
leverage		0.41^a (3.4)			0.44^a (3.6)			0.52^a (3.9)	
Log (# Investors)			-0.07^a (-4.7)			-0.06^a (-4.1)			-0.06^a (-5.0)
Number of Regressions	126	126	72	126	126	72	108	108	72

Table 5: Stock price Synchronicity with local and global macroeconomic factors

Panel A of this table reports average R-squared from firm-level time-series regressions of monthly stock returns on global and local macroeconomic factors. The global factors are Brent crude oil monthly spot prices, US S&P500 index monthly closing prices, and MSCI Emerging markets index monthly closing prices. For local factors, we use the first eight principal components of 67 local Saudi macroeconomic factors that capture 65% of variation. Panel B reports Fama-MacBeth (1973) cross-sectional regression estimates, where the dependent variable is logistic transformed R² estimated from eq (3a) and (3b). The independent variables are Islamic dummy variable that equals one if the firm is classified as Islamic and zero otherwise, “Size” is the natural log of firm market value, “B/M” Book-to-market ratio, “ROA” firm return on assets, “VROA” is firm quarterly ROA volatility over the past 3 years, “DD” is a dummy variable that equals one if the firm pay dividends and zero otherwise, “Age” is the number of month since the firm appears in our data, Number of analyst, “Leverage” is firm debt to asset ratio and we put missing values for firms in Banks & Financial Service and Insurance sectors, and “Number of investors” which is the total number of investors for each firm at the end of the month (from Jan 2010 to Dec 2015). We average coefficients cross-sectionally each month and then across months. Intercepts and coefficients on the industry dummies are not reported to save space. In parentheses are the Fama–MacBeth t-statistics calculated using Newey-West corrected standard errors.

Panel A: Time series regression of stock returns on global and local factors								
	Brent Oil	US S&P500	MSCI Emerging Mkts	All Global	Local macro factors			
Islamic stocks	7.83% ^a (12.19)	7.01% ^a (9.82)	10.22% ^a (11.87)	14.17% ^a (14.41)	18.29% ^a (13.93)			
Conventional stocks	5.87% ^a (8.92)	5.41% ^a (10.45)	8.18% ^a (11.72)	11.21% ^a (12.90)	12.95% ^a (13.85)			
Difference	1.96% ^b (2.11)	1.61% ^c (1.86)	2.03% ^c (1.85)	2.96% ^b (2.26)	5.34% ^a (3.40)			
All Stocks	6.75% ^a (14.44)	6.13% ^a (14.19)	9.10% ^a (16.58)	12.53% ^a (19.05)	15.32% ^a (19.12)			
Panel B: Cross-sectional regression of R-squared								
	Global R-squared				Local R-squared			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Islamic dummy	0.59 ^a (3.38)	0.54 ^a (3.01)	0.67 ^a (3.14)	0.43 ^b (2.02)	0.55 ^a (3.78)	0.51 ^a (3.36)	0.62 ^a (3.53)	0.53 ^a (2.89)
Size	0.16 ^b (2.05)	0.14 ^c (1.73)	0.22 ^b (2.22)	0.07 (0.68)	0.15 ^b (2.38)	0.05 (0.71)	0.08 (0.97)	0.01 (0.10)
B/M	0.13 (0.45)	0.09 (0.31)	-0.06 (-0.18)	-0.23 (-0.63)	-0.42 ^b (-1.97)	-0.40 ^c (-1.85)	-0.68 ^a (-3.12)	-0.83 ^a (-3.22)
ROA	-4.47 (-0.98)	-5.24 (-1.16)	-8.21 (-1.25)	-3.44 (-0.47)	-4.11 (-0.96)	-5.62 (-1.26)	-5.98 (-1.04)	-2.16 (-0.33)
VROA	-82.3 (-0.34)	-99.5 (-0.43)	-189.9 (-0.58)	-101.6 (-0.28)	-33.5 (-0.17)	-7.6 (-0.04)	-44.2 (-0.16)	56.8 (0.19)
DD	-0.37 (-1.22)	-0.44 (-1.42)	-0.39 (-1.13)	-0.25 (-0.79)	-0.22 (-0.75)	-0.23 (-0.80)	-0.30 (-0.95)	-0.05 (-0.14)
Log (Age)		0.22 (1.21)	0.21 (1.20)	0.47 ^b (2.40)		-0.16 (-1.03)	-0.12 (-0.72)	0.16 (0.76)
Number of analysts		0.03 (0.63)	0.01 (0.19)	0.00 (0.00)		0.10 ^a (2.89)	0.08 ^b (2.27)	0.05 (1.30)
Leverage			-0.07 (-0.07)	-0.54 (-0.52)			0.48 (0.65)	-0.02 (-0.03)
Number of investors				0.34 ^a (3.80)				0.30 ^a (3.21)
Number of observations	203	203	203	189	201	201	201	187

(a) significant at 1% , (b) significant at 5% and (c) significant at 10%

Table 6: Systematic and unsystematic turnover

For each stock each month, the following time-series regression is run using daily turnover:

$$turnover_{i,t} = \alpha_0 + \alpha_1 turnover_{m,t+1} + \alpha_2 turnover_{m,t} + \alpha_3 turnover_{m,t-1} + \varepsilon_{i,t}$$

Systematic turnover is α_1 times market turnover the next day, plus α_2 times the contemporaneous market turnover, plus α_3 times the previous day's market turnover. Unsystematic turnover is α_0 . For each month, average systematic turnover, average unsystematic turnover, average α_1 , and average α_2 are calculated for Islamic and conventional stocks. For each month, average systematic turnover, average unsystematic turnover, average α_1 , and average α_2 are calculated for Islamic and Conventional stocks. In parentheses are the Fama–MacBeth t-statistics calculated using Newey–West corrected standard errors.

	Islamic Stocks		Conventional stocks		All stocks		Difference	
	Mean	t-stat	Mean	t-stat	Mean	t-stat	Mean	t-stat
Systematic Turnover	4.00%^a	(3.79)	3.04%^a	(4.09)	3.32%^a	(4.05)	0.96%^a	(4.3)
Unsystematic Turnover	0.33%	(1.35)	0.98%^a	(3.65)	0.76%^a	(3.10)	-0.65%^a	(-3.4)
Coef. of Mkt Turnover_{t+1}	0.33^a	(2.62)	0.10	(0.95)	0.18^c	(1.92)	0.23	(1.6)
Coef. of Mkt Turnover_t	3.51^a	(6.59)	3.13^a	(6.73)	3.24^a	(6.88)	0.39^b	(2.4)
Coef. of Mkt Turnover_{t-1}	0.51^a	(5.03)	0.19	(1.7)	0.28^a	(3.42)	0.32^b	(2.0)
Sum Coef.s t-1 to t+1	4.35^a	(6.76)	3.42^a	(8.04)	3.70^a	(7.91)	0.93^a	(3.1)
Average R-squared	0.252		0.247		0.249		0.005	

(a) significant at 1% , (b) significant at 5% and (c) significant at 10%

Table 7: Cross-sectional regressions of Systematic and unsystematic turnover

The table reports Fama-MacBeth (1973) cross-sectional regression estimates, where the dependent variable is firm systematic, unsystematic, and the coefficient of contemporaneous market turnover, measured using monthly regression of firm daily stock returns using the following model:

$$turnover_{i,t} = \alpha_0 + \alpha_1 turnover_{m,t+1} + \alpha_2 turnover_{m,t} + \alpha_3 turnover_{m,t-1} + \varepsilon_{i,t}$$

Independent variables are Islamic dummy variable that equals one if the firm is classified as Islamic and zero otherwise, “Size” is the natural log of firm market value, “B/M” Book-to-market ratio, “ROA” firm return on assets, “DD” is a dummy variable that equals one of the firm pay dividends and zero otherwise, “Age” is the number of month since the firm appears in our data, “1/p” is the inverse of share price, “RV” is daily stock return volatility over the past month, “Number of analyst”, and “Number of investors” which is the total number of investors for each firm at the end of the month (from Jan 2010 to Dec 2015). We average coefficients cross-sectionally each month and then across months. Intercepts and coefficients on the industry dummies are not reported to save space. In parentheses are the Fama–MacBeth t-statistics calculated using Newey–West corrected standard errors.

	Systematic turnover			Unsystematic turnover			Same day market turnover coef.		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Islamic dummy	0.60^b (2.65)	0.47 (1.68)	-0.05 (0.39)	-0.49^c (2.60)	-0.40 (1.65)	0.05 (0.22)	0.40^c (2.05)	0.24 (1.10)	-0.05 (0.18)
Size	-1.18^a (-3.63)	-1.56^b (-3.18)	-0.66^a (-5.01)	-0.35^c (-2.57)	-0.58^b (-3.16)	-0.60^a (-4.42)	-1.17^a (-5.04)	-1.66^a (-5.89)	-1.31^a (-5.07)
B/M	-2.26^c (-2.19)	-2.90^c (-2.25)	-0.94 (-1.76)	-0.45 (-0.67)	-0.92 (-1.11)	-1.19^c (-2.45)	-2.08^b (-3.19)	-2.74^a (-3.39)	-2.19^c (-2.26)
ROA	-0.40 (-0.15)	-2.53 (-0.92)	0.69 (0.78)	-2.24 (-1.31)	-2.94 (-1.39)	-2.97^b (-2.99)	-1.02 (-0.36)	-1.03 (-0.39)	0.27 (0.16)
DD	-0.69^c (-2.22)	-0.21 (-1.13)	-0.23 (-1.91)	0.09 (0.45)	-0.14 (-0.68)	-0.14 (-0.83)	-0.50 (-1.59)	-0.32 (-1.49)	-0.59^c (-2.27)
Log (Age)	1.31^b (2.61)	0.38 (1.03)	0.37^c (2.14)	-0.25 (-0.81)	-0.05 (-0.13)	-0.19 (-1.28)	2.22^c (2.04)	0.32 (1.07)	0.62 (1.56)
1/p	48.04 (1.40)	57.15 (1.25)	25.86^c (2.31)	-38.51 (-1.78)	-49.84 (-1.68)	-6.14 (-0.73)	42.18^c (2.18)	48.09 (1.87)	46.93^c (2.60)
Log (RV)	0.69^a (3.65)	0.44^c (2.36)	0.59^a (3.47)	1.11^a (3.63)	1.43^a (3.76)	0.69^a (5.51)	1.04^a (4.67)	0.80^b (3.22)	1.07^a (3.57)
# Analysts		1.10 (1.12)	0.08^b (3.10)		0.65 (1.89)	0.16^a (3.70)		0.84 (1.45)	0.21^a (4.33)
Log (# Investors)			0.05 (0.70)			-0.17^c (-2.20)			0.06 (0.50)
Number of regressions	168	126	72	168	126	72	168	126	72

(a) significant at 1% , (b) significant at 5% and (c) significant at 10%

Table8: Stock liquidity And trading activity

In the regressions, the dependent variable is the daily stock turnover or Amihud's illiquidity for firm *i* on calendar day *j*. Turnover is defined as trading volume divided by shares outstanding. Explanatory variables are an Islamic dummy variable equal to one if the firm is classified as Islamic or zero otherwise, firm size computed as the natural logarithm of the market value, Book-to-market ratio, (ROA) firm return on assets, Number of analyst, Leverage which is total debt/total assets, (Age) firm age which is the number of month since the firm appears in our data, number of investors which is the total number of investors for each firm at the end of the month (from Jan 2010 to Dec 2015), (1/*p*) the inverse of the stock price, and a dummy variable for each industry. The cross-sectional regressions weight each day equally. The parameter values are the average of the cross-sectional regressions. In parentheses are the Fama–MacBeth autocorrelation-adjusted t-statistics. Intercepts and coefficients on the industry dummies are not reported to save space.

	<i>Log (ILLIQ)</i>		<i>ILLIQMA</i>		<i>Log(Turnover)</i>	
	(1)	(2)	(1)	(2)	(1)	(2)
Islamic dummy	-0.24^a (14.5)	-0.23^a (14.4)	-0.33^a (10.8)	-0.32^a (10.6)	0.24^a (15.2)	0.27^a (19.3)
Size	-0.45^a (-36.5)	-0.59^a (-46.9)	-0.26^a (-21.5)	-0.41^a (-26.7)	-0.60^a (-46.6)	-0.55^a (-36.3)
ROA	1.95^a (13.5)	1.22^a (8.7)	1.47^a (8.1)	0.67^b (2.9)	-2.60^a (-16.1)	-2.26^a (-14.4)
Log (Age)	-0.09 (-1.7)	0.05 (0.9)	-0.34^c (-2.3)	-0.19 (-1.3)	0.04 (0.7)	-0.001 (0.0)
Log (RV)	-0.18^a (-8.2)	-0.16^a (-7.6)	-0.12^a (-3.9)	-0.10^a (-3.3)	0.36^a (13.8)	0.36^a (13.8)
1/<i>p</i>		-6.84^a (-10.0)		-8.03^a (-7.3)		5.19^a (6.8)
Log (Turnover)		-0.15^a (-22.2)		-0.14^a (-12.0)		
R-square	0.38	0.42	0.27	0.30	0.71	0.71
Number of observations	3410	3410	3410	3410	3410	3410

^a significant at 1%, ^b significant at 5% and ^c significant at 10%

Table 9: Robustness check

This table repeat the regressions of previous tables but with firms that operate in Banks & Financial Service and Insurance sectors only. The regressions are cross-sectional regressions performed every month except for liquidity measures where the regressions are done every day. Dependent variables are, Log of Number of investors, logistic transformed idiosyncratic volatility (eq. 3c), logistic transformed measure of synchronicity R2 (eq. 2d), Systematic turnover (eq 4a), liquidity measures, Amihud's (2002) and stock turnover. Independent variables are "Islamic dummy" variable that equals one if the firm is classified as Islamic and zero otherwise, "Size" is the natural log of firm market value, "ROA" firm return on assets, "Age" is the number of month since the firm appears in our data, "DD" is a dummy variable that equals one of the firm pay dividends and zero otherwise, "1/p" is the inverse of share price, "B/M" Book-to-market ratio, "Number of analyst", and "Number of investors" which is the total number of investors for each firm at the end of the month (from Jan 2010 to Dec 2015), "RV" is daily stock return volatility over the past month, "VROA" is firm quarterly ROA volatility over the past 3 years, "Turnover" is the stock monthly turnover for the past month calculated as the ratio of traded stock volume over firm total shares outstanding, and "Momentum" is the average stock monthly return for the last six months. We average coefficients cross-sectionally (for liquidity) each month (day) and then across months (days). Intercepts and coefficients on the industry dummies are not reported to save space. In parentheses are the Fama-MacBeth t-statistics calculated using Newey-West corrected standard errors.

	Number of investors	Idiosyncratic volatility	Synchronicity		Systematic turnover	Liquidity	
			Global	Local		ILLIQ	Turnover
Islamic dummy	0.91^a (3.79)	-0.54^a (4.80)	0.42 (1.29)	0.71^b (2.09)	-0.06 (0.10)	-1.36^a (10.6)	1.55^a (15.4)
Size	0.52^a (12.06)	0.17^a (4.15)	-0.27 (-1.46)	-0.17 (-0.66)	-0.48 (-1.32)	-1.04^a (-15.6)	-0.21^a (-3.4)
ROA	2.48^a (7.70)	-10.85 (-0.90)	-2.23 (-0.17)	-6.82 (-1.07)	2.76 (0.55)	7.79 (1.0)	3.11 (0.6)
Log (Age)	-0.64^a (-11.62)	-0.04 (-0.10)	0.28 (0.54)	-0.38 (-1.10)	0.50 (0.65)	2.85^a (5.9)	-2.75^a (-6.9)
DD	-1.15^c (-2.34)	-0.29^c (-2.07)	-1.05 (-1.66)	-0.44 (-0.58)	0.61 (0.91)		
1/p	22.48^a (16.60)	-6.11^c (-2.37)			40.83 (1.93)	-28.44^a (-6.9)	23.59^a (6.6)
B/M		0.36^c (2.27)	1.05^c (1.76)	1.20^b (2.37)	-2.00 (-1.34)		
# Analysts		-0.09^a (-6.01)	0.31^b (2.21)	0.35^c (2.00)	0.08 (0.84)		
Log (# Investors)		0.02 (0.45)	-0.04 (-0.33)	-0.21 (-1.32)	0.20 (0.77)		
Log (RV)	-0.01 (-0.13)				0.44 (1.36)	-0.04 (-0.7)	0.21^a (4.3)
VROA		36.07 (0.56)	(40.98) (0.17)	-99.5 (-0.66)			
Log (Turnover)	0.16^a (6.77)					-0.24^a (-11.9)	
Momentum	0.43 (0.57)						
R-squared	0.69	0.46	0.23	0.42	0.32	0.61	0.81

^a significant at 1% , ^b significant at 5% and ^c significant at 10%