The impact of Islamic accounting standards on information asymmetry

The case of Gulf Cooperation Council (GCC) member countries

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Abstract

Purpose – The purpose of this paper is to investigate whether disclosure as required by Islamic Financial Service Board Standard No. 4 (IFSB-4) influences information asymmetry among investors in the Gulf Cooperation Council (GCC) member countries. In addition, the paper investigates whether the influence of IFSB-4 on information asymmetry varies between Islamic and conventional financial institutions.

Design/methodology/approach – The paper tests the hypotheses using a sample of firms listed in the GCC over a period of 2000-2013. Ordinary least square regression and fixed-effects estimation techniques are applied to test the hypotheses.

Findings – The findings reveal that information asymmetry among investors is lower after the implementation of IFSB-4 than before, indicating that the standard has increased transparency. The results also reveal that information asymmetry after the implementation of IFSB-4 is lower for Islamic than for conventional financial institutions. This suggests that IFAB-4 promotes more transparency for Islamic than conventional institutions.

Research limitations/implications – Owing to data availability, we were unable to use other proxies of information asymmetry, e.g. bid-ask spreads, and the level of disclosure, e.g. self-constructed disclosure index.

Practical implications – The paper concludes that disclosures under IFAB-4 reduce information asymmetry among investors. In this context, this study increases the awareness of standard setters academics investors regulators and many other stakeholders about the economic consequences of disclosure standards in the region.

Originality/value – This study takes a first step to fill evident gaps in the literature by investigating the influences of disclosure standard on information asymmetry in a unique setting that is often ignored by accounting researchers, which helps to widen our knowledge on accounting practices across the globe.

Keywords Islamic financial institutions, Disclosure, Information asymmetry, Gulf Cooperation Council (GCC), IFAB-4, Islamic accounting standards

Paper type Research paper

1. Introduction

Theoretical studies on firms' accounting recognition and disclosure decisions suggest that higher quality financial reporting and better disclosure reduces adverse selection problems and mitigates the information asymmetry problem by "leveling the playing field" for all investors (Diamond and Verrecchia, 1991; Leuz and Verrecchia, 2000; Verrecchia, 2001; Lambert *et al.*, 2007). While many prior studies have documented these benefits of quality disclosure, the vast majority of research on the economic consequences of accounting recognition and disclosure regulation is based on samples drawn from developed and mature capital markets. Moreover, although Islamic financial institutions (IFIs), which are becoming one of the most significant aspects of the modern global financial system, have faced accounting reporting problems because current accounting reporting standards (i.e. IFRS or generally accepted accounting principles [GAAP]) are based on conventional institutions, there is limited empirical research on the consequences of Islamic accounting standards.

The aim of this paper is to investigate whether accounting information disclosure as required by Islamic Financial Services Board Standard No. 4 (IFSB-4) influences market liquidity and information asymmetry among investors in the six Gulf Cooperation Council (GCC) member countries, namely Bahrain, Oman, Kuwait, Saudi Arabia, Qatar and the United Arab Emirates (UAE)[1]. In addition, we investigate whether the influence of IFSB-4 on market liquidity and information asymmetry varies between IFIs and conventional financial institutions.

Previous analytical and empirical studies suggest that higher accounting quality financial reporting and better disclosure should reduce adverse selection problems in share markets and lower information asymmetry (Verrecchia, 2001; Lambert *et al.*, 2007; Healy *et al.*, 1999). Healy *et al.* (1999) and Leuz and Verrecchia (2000) provide evidence that information asymmetry and liquidity proxies are associated with firms' disclosure and accounting policies. Similarly, Daske *et al.* (2008) find that market liquidity increased around the time of the introduction of International Financial Reporting Standards (IFRS).

In December 2007, the Islamic Financial Service Board (IFSB) issued *IFSB-4*, which outlines new requirements for institutions offering Islamic financial services to follow in preparing disclosures. The aim of the requirements is to promote transparency and market discipline.

Based on prior studies, we expect information asymmetry to be lower after the implementation of accounting information disclosure as required by IFSB-4 than before. Moreover, we expect this information asymmetry to be lower for IFIs than conventional financial institutions.

To test our hypotheses, like Linsmeier *et al.* (2002), we used trading volume to measure market liquidity and information asymmetry. Consistent with prior studies (Linsmeier *et al.*, 2002), we measured trading volume as the square root of the number of shares traded divided by the number of shares outstanding for such firms. To capture the impact of IFSB-4 on information asymmetry, we created an indicator variable that takes the value of 1 for fiscal years ending after the adoption of IFSB-4, and equals 0 otherwise. To identify IFIs, we used an indicator that takes the value of 1 for firms that are classified as Islamic institutions, and equals 0 otherwise.

Analyzing a sample of 395,670 firm-day observations from 2000 to 2013, we found that information asymmetry is lower after the implementation of IFSB-4 than before, indicating that the standard has increased transparency on average. We also found that information asymmetry after the implementation of the standard is lower for Islamic than conventional financial institutions. The findings suggest that IFAB-4 disclosures promote more transparency for IFIs than conventional institutions. The results are consistent with

previous studies that have predicted and showed that higher information disclosure practice reduces information asymmetry among investors (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994; Cheng *et al.*, 2006; Daske *et al.*, 2008; Healy *et al.*, 1999).

This study contributes to the literature in several ways. First, prior research has extensively examined the consequences of disclosure levels of firms in developed countries. This study takes a first step to fill evident gaps in the literature by investigating the influences of adopting IFSB-4 on market liquidity and information asymmetry among investors in a unique setting that is often ignored by accounting researchers. This will help to widen academics, investors, regulators and many other stakeholders' knowledge on accounting practices across the globe. Second, previous studies indicate that IFIs face major challenges in preparing financial statements under different accounting standards, which may cause problems of comparability, reliability and compliance level (Sarea and Hanefah, 2013; Aljifri, 2013). These studies suggest that there is a need for research on Islamic accounting standards. This study takes a step to fill these gaps in the literature by providing empirical evidence on the consequences of Islamic accounting standards on market liquidity and information asymmetry. Finally, the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) and the International Accounting Standards Board (IASB) are working together to strengthen co-operation between AAOIFI and the IASB toward a better understanding of issues relating to accounting standards for the Islamic finance industry. In this context, this study increases the awareness of standard setters, academics, investors, regulators and many other stakeholders about the economic consequences of accounting information disclosure in the region.

The remainder of the paper is organized as follows. Section 2 provides the institutional background. Section 3 reviews prior literature and develops our hypotheses. Section 4 describes our research design. Section 5 presents the empirical results. Section 6 concludes the paper.

2. Institutional background
2.1. Islamic financial institutions in the Gulf Cooperation Council
The GCC is formed in 1981 to promote economic cooperation and development in the region. The six GCC member countries share several common characteristics (such as cultural, social, and religion). IFIs in the GCC are significant sources of capital and are contributing to the development of Islamic finance worldwide, especially in Asia. Also, the preference for Islamic banking in the GCC indicates that it is more of a bottom-up than a top-down movement (Salim and Mahmoud, 2016). IFSB Stability Report (2015) reveals that the global Islamic finance industry has been in an upward trajectory, evidenced by its assets' double-digit compound annual growth rate of 17 per cent between 2009 and 2013. The industry's assets are estimated to be worth USD1.87 trillion as in 2014, having grown from USD1.79 trillion as at end-2013. The GCC region accounts for the largest proportion of Islamic financial assets as the sector sets to gain mainstream relevance in most of its jurisdictions; the region represents 37.6 per cent of the total global Islamic financial assets. The Middle East and North Africa (MENA) region (excluding GCC) ranks a close second, with a 34.4 per cent share, buoyed by Iran's fully Sharia-compliant banking sector. Asia ranks third, representing a 22.4 per cent share in the global total, largely spearheaded by the Malaysian Islamic finance marketplace.

The Islamic financial system is a faith-based system of financial management, which derives its principles from the Islamic common law (Islamic *Shari'a*). It promotes profit-sharing in the conduct of each financial transaction as well as prohibiting paying or receiving interest on any transaction (Salleh and Hassan, 2004). To ensure the proper

implementation of these principles; the IFIs are governed by a board of Islamic scholars called the "Shari'a Supervisory Board" (Garas and Ribiere, 2007). Furthermore, the Islamic financial system is based on equity-based system not on debt-based system, which is the base of conventional banking system (Khan, 2000). Accordingly, IFIs offer a uncertain rate of return to the investors, and in case of incurring any risk, it is shared between IFIs and their investors. The prohibition of predetermined interest rate on loans puts pressure on IFIs to monitor the borrowers at a reasonable cost and get the exact information about the generated profit because the lender might provide asymmetric information about the real profit. Therefore, the portfolios of IFIs tend to be concentrated in short-term, trade-related assets (Diamond and Dybvig, 1983, p. 401). This emphasis on short-term financing leads to an inimical effect on investment, growth and economic development. This concept reflects the social commitment between the bank and the investors in enhancing the economy.

IFIs offer a wide range of financial products starting from simple contracts of profit-sharing agreement, which is similar to time deposit in conventional banks, to issuing Islamic bonds and derivatives. These products include profit sharing agreement (*Mudharabah*), cost-plus-financing (*Murabaha*), equity participation (*Musharaka*) and leasing (*Ijarah*). These products are based on real assets rather than financial assets (Bahrain Monetary Agency, 2006, p. 22). The growth of IFIs attracted some of the conventional financial firms (i.e. ABN AMRO, Citibank and HSBC) to add the service of Islamic windows to their clients.

IFIs are becoming one of the most significant aspects of the modern global financial system. They include an increasingly diverse range of institutions, such as commercial and investment banks, mutual insurance and investment companies. Over the past few decades, the industry has rapidly expanded worldwide, with assets exceeding $200 billion and an annual growth rate of 12-15 per cent. IFI assets are heavily concentrated in the Middle East and Asia. According to the Islamic Financial Services Industry Stability 2015 report, the GCC region accounts for the largest proportion of Islamic financial assets, representing 37.6 per cent of total global Islamic financial assets. The MENA region (excluding the GCC) and Asia are second and third, respectively, with 34.4 and 22 per cent shares of total global Islamic financial assets.

2.2 Islamic Financial Services Board Standard No. 4
The IFSB is an international standard-setting organization that promotes and enhances the soundness and stability of the Islamic financial services industry by issuing global prudential standards and guiding principles for the industry, broadly defined to include banking, capital markets and insurance sectors. In December 2007, the IFSB published its IFSB-4 standard, which outlines new requirements for institutions offering Islamic financial services (IFIs) to follow (excluding Islamic insurance institutions and Islamic mutual funds) in preparing disclosures. The aim of these requirements is to promote transparency and market discipline, consistent with the fulfillment of *Shari'ah* regulations. According to the Qur'an (in, among others, Surah An-Nisa' verse 135 and Surah Al-Mutaffifin verses 1 to 3), any form of concealment, fraud or attempt at misrepresentation violates the principles of justice and fairness in *Shari'ah*.

IFSB-4 is to be applied to IFIs, including Islamic funds managed by IFIs, in the form of restricted investment accounts and Islamic window operations for conventional banks (with both asset and funding facilities). It should be applied on a fully consolidated basis at the holding company level within a group or sub-group of the IFIs, or, as appropriate, on an individual basis subject to the discretion of the supervisory authorities. However, IFSB-4 should not be applied at the consolidated level to a group or sub-group that consists of

entities other than IFIs. Among the areas covered by IFSB-4 are corporate information, capital structure and capital adequacy.

IFSB-4 proposes to standardize qualifying criteria of disclosures among member countries whose supervisory practices related to disclosures may vary. Specifically, IFSB-4 highlights the standardization on the treatment of the risk-weighted assets attributable to the investment account holders in computing the IFI's capital requirements and related disclosures on the displaced commercial risk. Implementing IFSB-4, together with other relevant international accounting standards and rules, is anticipated to enable professional, international and national accounting bodies and other related institutions or agencies, including auditors, to facilitate the appropriate disclosures.

3. Literature review and hypothesis development

3.1 Islamic banking and its accounting practices
Although in Western countries, there is a gap between religion and financial system, under Islam, there is no separation between religious life and business life (Nicholas, 1994). The universe of Islamic concepts that governs financial affairs can be classified as "*ethical capitalism*" because it has two precepts: theological and commercial, whereas the first precept is derived from the Quran which ascertains that everyone has a free will to make the right decision (Siddiqi, 1999), the second precept confirms that individuals are entitled to own private property and trade these properties according to Islamic rules (Lewis, 2005; Abu-Tapanjeh, 2009). The principles of the Islamic financial system are derived from the Islamic canon law and relate to the distribution of wealth (Usmani, 2002), and enhancement of country's economy through purchasing and selling physical assets which yield legitimate profits and build the country's infrastructure (Siddiqi, 1999; Loqman, 1999).

The development of accounting theory and practice in Islamic banking is founded on provisions of Islamic canon law along with other necessary principles where objectives are established based on the spirit of Islam and in relation to contemporary accounting thought (Gambling and Karim, 1986; Adnan and Gaffikin, 1997; Askary and Clarke, 1997; Baydoun and Willett, 1997). For instance, Askary and Clarke (1997) emphasized the concept of social accountability by arguing that every Muslim has an "account" with *Allah* which includes all good and bad actions. The implementation of this concept resolves the agency problem because both management and shareholders are held accountable to a higher authority (*Allah*) for their actions (Lewis, 2001). Furthermore, The Quran emphasized all the principles and assumptions of international accounting standards such as materiality (*Quran* 5:16), reliability (*Quran* 4:58), presentation (*Quran* 11:84-85), full disclosure (*Quran* 2:71), recording (*Quran* 2:282) and periodicity which is emphasized in fulfilling *Zakat* obligation once a year. On the other hand, Islamic banking provides services to its customers free from any interest or other prohibited gain because it is prohibited per Islamic law (*Quran* 2:275; Hamid, 1992; Haque, 1999).

3.2. Information disclosure and information asymmetry
Previous studies have extensively examined the economic consequences of voluntary disclosure. For example, Diamond and Verrecchia (1991) and Kim and Verrecchia (1994) argued that voluntary disclosure reduces information asymmetry among uninformed and informed investors, which increases the liquidity of a firm's stock. Persen (2006) and Lundholm (1996) also found a negative and statistically significant association between level of disclosure and proxies for information asymmetry. Weker (1995) examined the association between information asymmetry and disclosure. He found that a high-quality disclosure policy reduces information asymmetry, which increases liquidity in equity markets. Similarly, Schrand and Verrecchia (2004) found that quality of disclosure is negatively

associated with proxies for information asymmetry. Using different proxies of information asymmetry, Cheng *et al.* (2006) reported a negative relationship between voluntary disclosure and proxies of information asymmetry. They demonstrated that higher levels of information trading increase bid-ask spreads, trading volume and price volatility, whereas higher levels of uninformed trading reduces spreads and increases trading volume. Healy *et al.* (1999) also found a negative association between disclosure quality and proxies of information asymmetry. Lang and Lundholm (1996) reported that firms with more informative disclosures have larger analyst followings, less dispersion in analyst forecasts and less volatility in forecast revision. Barry and Brown (1986) showed that firms with high levels of disclosure are likely to have a lower cost of capital because of lower information risk than firms with lower disclosure levels, which have higher information risk. Consistent with this study, Myers and Majluf (1984) suggested that if there is information asymmetry, firms will view making public equity or debt offers to be costly for existing shareholders. Consequently, managers who anticipate making capital market transactions have incentives to provide voluntary disclosure to reduce the information asymmetry problem, thereby reducing the firm's external financing costs. Botosan (1997) also provided evidence that there is a negative relationship between cost of equity capital and level of voluntary disclosure.

From a mandatory disclosure perspective, Daske *et al.* (2008) examined the economic consequences of mandatory IFRS reporting around the world. Using a large sample of firms that are mandated to adopt IFRS, they found that, on average, market liquidity increases around the time of the introduction of IFRS. They also found a decrease in firms' costs of capital and an increase in equity valuations. Similarly, Daske *et al.* (2013) showed that serious IFRS adoption is associated with an increase in liquidity and a decline in cost of capital. Using analyst following and forecast dispersion as measures information asymmetry, Cuijpers and Burjink (2005) documented a positive association between IFRS/US GAAP adoption and analyst followings. Leuz (2003) also found that information asymmetry was reduced when firms changed from Germany's GAAP to either IFRS or US GAAP.

In summary, both analytical and empirical studies suggest that information asymmetry occurs when one or more investors possess private information about the firm's value, while other uninformed investors only have access to public information. The presence of information asymmetry creates an adverse selection problem in the market, which reduces market liquidity. Similarly, market regulators also argue that high-quality accounting standards reduce information asymmetry among investors and increase liquidity by leveling the playing field among investors and increasing investors' confidence. Previous studies have shown that increasing the level of disclosure should reduce the likelihood of information asymmetry among investors and increase market liquidity.

Following the above discussion, we predict that introducing IFSB-4 reduces information asymmetry. We also predict that this information asymmetry is lower for Islamic than conventional financial institutions. Hence, we formulate the following hypotheses:

H1. Information asymmetry is lower after the implementation of IFSB-4 than before.

H2. Information asymmetry after the implementation of IFSB-4 is lower for Islamic than conventional financial institutions.

4. Data and methodology
4.1 Data and sample
Data were collected for firms listed in the GCC covering the period of 2000-2013, a range of the 14-year data of which two equal windows (seven years before and seven years after

the introduction of IFSB-4 in December 2007) were comparably examined. Data were collected from year 2000 onward because stock prices and financial information prior to year 2000 are mostly missing. Our sample contains 395,670 firm-day observations (Figure 1). Trading volume and price data were hand collected from Bloomberg. Financial accounting data and reporting dates were collected from Compustat Global. To mitigate the influence of outliers, all variables were winsorized at the 0.5 and 99.5 percentiles. We also deleted observations with missing values. Below, we discuss the main variables used in our analyses (Table I).
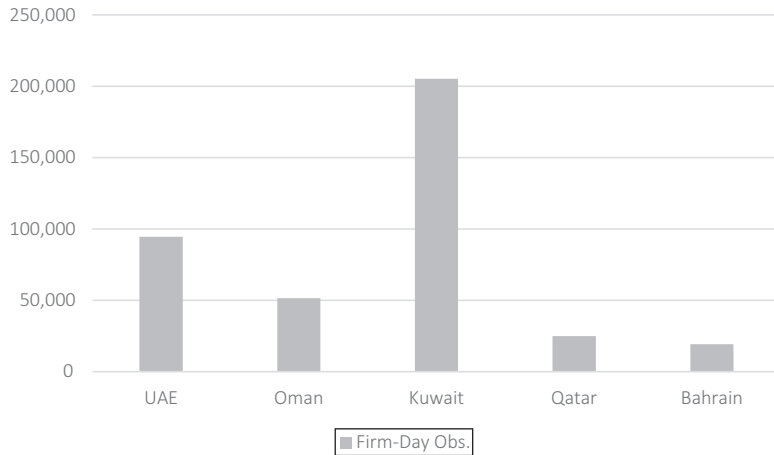

Figure 1.
Sample distribution by country

Variables	Measurement	Notation	Expected effect
Dependent variable			
Information asymmetry	Trading volume: the square root of the number of shares traded divided by the number of shares outstanding for each firm Higher trading volume indicates lower information asymmetry	INFO_ASY	
Major explanatory variables			
Islamic accounting standard	An indicator variable that takes the value of 1 for fiscal years ending after the adoption of IFSB-4, and 0 otherwise	POST_IFSB4	+
IFIs	An indicator variable that captures whether the firm is an IFIs, with a value of 1 for firms classified as IFIs, and 0 otherwise	ISF	+
Control variables			
Firm size	The natural logarithm of the market value of equity	SIZE	+
Leverage	The ratio of total liabilities to total assets	LEVERAGE	−
Growth opportunity	The ratio of the firm's market value of equity to book value	MTB	+
Firm performance	The square root of the absolute value of stock returns	RET	+

Table I.
Variables descriptions

4.2 Variable measurement
4.2.1 Measurement of information asymmetry. Following prior studies (Linsmeier *et al.*, 2002), we use trading volume to measure information asymmetry (*INFO_ASY*). We defined trading volume as the square root of the number of shares traded divided by the number of shares outstanding for each firm. Higher trading volume indicates lower information asymmetry.

4.2.2 Measurement of POST_IFSB *No. 4.* To examine the influence of information disclosure as required by IFSB No. 4 on information asymmetry, we applied a research design used by prior studies (Tessema, 2016; Zhang, 2009; Ahmed *et al.*, 2006; Linsmeier *et al.*, 2002). To measure IFSB No. 4 adoption, an indicator variable POST_IFSB4 takes the value of 1 for fiscal years ending after the adoption of IFSB No. 4, and equals 0 otherwise.

4.2.3 Measurement of Islamic financial institutions. To measure IFI, an indicator variable *ISF* takes the value of 1 for firms classified as IFIs, and equals 0 otherwise.

4.2.4 Control variables. We include several control variables that are expected to influence information asymmetry among investors. We control for firm size (*SIZE*) because studies such as Eng and Mak (2003) and Chau and Gray (2010) show that firm size and disclosure level are positively associated, as larger firms incur lower cost to prepare and disclose information than small firms. Moreover, larger firms disclose more information to benefit from a greater marketability and greater ease of financing. Thus, disclosure level (costs of disclosure) increases (decreases) with firm size (Welker, 1995). We measure *SIZE* as the natural logarithm of the market value of equity. We control for growth opportunities (*MTB*) because firms with higher growth opportunities disclose more information than firms with lower growth opportunities (Smith and Watts, 1992). We measure *MTB* as a ratio of firms' market value of equity to book value. We control for firm profitability performance (*RET*) because prior studies indicate firms do not provide more disclosures when they are not performing well and firms that perform well disclose more information to market participates. Moreover, capital market incentives induce more profitable firms to disclose more information (Hayes and Lundholm, 1996; Healy *et al.*, 1999). We measure *RET* as the natural logarithm of returns. We control for leverage (LEVERAGE) because larger proportion of debt in the capital structure firms (leveraged firms) are expected to disclosure less information because leverage helps control the free cash flow problem, and the agency costs of debt are controlled through restrictive debt covenants in debt agreements (Jensen, 1986). We measure LEVERAGE as the ratio of total liabilities to total assets. Numerous prior studies (Verrecchia, 2001; Leuz and Verrecchia, 2000) on the impact of disclosure on information asymmetry among investors indicate that greater disclosure, makes markets more liquid, and thus reduces the information asymmetry. Consequently, we expect the coefficient on LEVERAGE to be negative and the coefficient on MTB, SIZE and RET to be positive.

4.3 Model for testing H1
The following regression equation was used to investigate whether information asymmetry changed significantly from the pre- to the post-IFSB-4 period:

$$INFO\_ASY_{it} = \beta_0 + \beta_1 POST\_IFSB4_t + \beta_2 MTB_{it} + \beta_3 SIZE_{it} + \beta_4 LEVERGAE_{it} + \beta_5 RET_{it} + \varepsilon_{it} \tag{1}$$

All variables are defined as before.

The coefficient on *POST_IFSB4* (i.e. β_1) measures the change in information asymmetry from pre- to post-IFSB-4 period. Given our prediction that information asymmetry is lower

(higher trading volume) after the adoption of IFSB-4 than before, we expected β_1 to be positive and significant.

4.4 Model for testing H2
The following regression equation was used to investigate whether information asymmetry after adoption of IFSB-4 is lower for the IFIs than conventional financial institutions:

$$
\begin{aligned}
INFO\_ASY_{it} = {} & \beta_0 + \beta_1 ISF_j + \beta_2 POST\_IFSB4_t + \beta_3 ISF_j * POST\_IFSB4_t \\
& + \beta_4 MTB_{it} + \beta_5 SIZE_{it} + \beta_6 LEVERGAE_{it} + \beta_7 RET_{it} + \varepsilon_{it}
\end{aligned} \tag{2}
$$

All variables are defined as before.

The coefficient on *POST_IFSB4* (i.e. β_3) measures the changes in information asymmetry from pre- to post-IFSB-4 period for IFIs. The sum of coefficients on *POST_IFSB4* and *ISF* $\times$ *POST_IFSB4* (i.e. $\beta_1 + \beta_3$) measures whether information asymmetry after the implementation of IFSB-4 is lower for IFIs than conventional financial institutions. Following our prediction, we expected $\beta_1 + \beta_3$ to be positive and significant.

5. Empirical results
5.1 Descriptive statistics
Table II reports descriptive statistics for the variables used in this study. Their mean and median values were generally comparable to those documented in previous studies. Small difference between variable means and medians indicates that the variables used in this study were not highly skewed.

Table III presents simple correlations of the variables used in the regression analysis, with Pearson correlations presented below the diagonal and Spearman correlations presented above. As predicted, there was a positive association between *ISF* and *INFO_ASY*, as indicated by both Pearson and Spearman correlation coefficients. *INFO_ASY* was lower for firms with higher market to book ratio, leverage and larger size.

Variables	N	Mean	SD	Minimum	Median	Maximum
INFO_ASY	395,670	43.0905	46.5294	0.0244	28.2512	1253.97
POST_IFSB4	395,670	0.6779	0.4673	0.0000	1.0000	1.0000
MTB	395,670	0.2458	58.1105	−2324.58	1.2932	113.5671
SIZE	395,670	5.7039	2.3613	0.5878	5.2579	11.7889
LEVERAGE	395,670	0.4924	0.2696	0.0018	04810	1.0000
RET	395,670	1.0001	0.0277	0.0692	1.0000	15.1344
	395,670					
ISF	395,670	0.1539	0.3609	0.0000	0.0000	1.0000

Notes: The table reports descriptive statistics; *INFO_ASY* is the square root of number of shares traded divided by the number of shares outstanding for such firms; *POST_IFSB4* is an indicator variable captures whether the fiscal year is after the adoption of IFSB-4, and takes the value of 1 for fiscal years ending after the adoption of IFSB-6, and 0 otherwise; *ISF* is an indicator variable captures whether the firm is an Islamic institute, and takes the value of 1 for firms that are classified as Islamic institutions and 0 otherwise; *MTB* is the ratio of firms' market value of equity to book value; *SIZE* is the natural logarithm of the market value of equity; *LEVERAGE* is the ratio of total liabilities to total assets; RET is the square root of the absolute value of the stock returns

Table II.
Descriptive statistics for regression variables

Variables	INFO_ASY	ISF	POST_IFSB4	MTB	SIZE	LEVERAGE	RET
INFO_ASY	1.000	0.102***	−0.035***	−0.008***	−0.152***	−0.112***	0.084***
ISF	0.092***	1.000	0.029***	0.010***	−0.108***	0.143***	−0.003*
POST_IFSB4	−0.069***	0.029***	1.000	−0.027***	−0.087***	0.052***	−0.014***
MTB	−0.094***	−0.076***	−0.472***	1.000	−0.029***	−0.042***	0.001
SIZE	−0.166***	−0.103***	−0.102***	0.416***	1.000	0.305***	0.006***
LEVERAGE	−0.116***	0.142***	0.051***	0.208***	0.298***	1.000	−0.000
RET	0.093***	−0.010***	−0.017***	0.037***	0.019***	0.007***	1.000

Notes: The table reports the values of the correlation between variables used in the regression analyses; Spearman (Pearson) correlations are above (below) the diagonal; *INFO_ASY* is the square root of number of shares traded divided by the number of shares outstanding for such firms; *POST_IFSB4* is an indicator variable captures whether the fiscal year is after the adoption of IFSB-4, and takes the value of 1 for fiscal years ending after the adoption of IFSB-4, and 0 otherwise; *ISF* is an indicator variable captures whether the firm is an Islamic institute, and takes the value of 1 for firms that are classified as Islamic institutions and 0 otherwise; *MTB* is the ratio of firms' market value of equity to book value; *SIZE* is the natural logarithm of the market value of equity; *LEVERAGE* is the ratio of total liabilities to total assets; *RET* is the square root of the absolute value of the stock returns

Table III.
Correlation coefficients

5.2. Results of tests of H1

Table IV presents the regression results for equation (1). The results of the pooled ordinary least square (OLS) regression model reported in Column 1 show that the estimated coefficient on *POST_IFSB4* is positive and significant (β_1 = 4.109; t = 9.25). Column 4 shows the results when including industry dummies in the regression model (i.e. industry-fixed-effects). The estimated coefficient on *POST_IFSB4* is positive and significant (β_1 = 2.992; t = 6.85). The results indicate that information asymmetry is lower after the implementation IFSB-4 than before.

The coefficients on the control variables are generally consistent with our predictions. The coefficient on LEVERAGE is negative and the coefficient on MTB and

Variables	Predicted sign	Dependent variable *INFO_ASY* I	II
POST_IFSB4	+	4.109*** (9.25)	2.992*** (6.85)
MTB	±	0.445*** (7.16)	0.302*** (4.93)
SIZE	±	−2.515*** (−23.55)	0.418*** (3.24)
LEVERAGE	±	−51.177*** (−52.11)	2.541* (1.93)
RET	±	546.681*** (44.99)	545.813*** (46.55)
INTERCEPT	±	−453.967*** (−37.32)	
Industry-fixed-effects		No	Yes
R^2		13	19
No. of Observations [a]Only IFIs		70,934[a]	70,934[a]

Notes: The table reports regression coefficient estimates and (in parentheses) *t*-statistics; industry-fixed-effects are included in the regression reported in columns II of the table; *INFO_ASY* is the square root of number of shares traded divided by the number of shares outstanding for such firms; *POST_IFSB4* is an indicator variable captures whether the fiscal year is after the adoption of IFSB-4, and takes the value of 1 for fiscal years ending after the adoption of IFSB-4, and 0 otherwise; *MTB* is the ratio of firms' market value of equity to book value; *SIZE* is the natural logarithm of the market value of equity; *LEVERAGE* is the ratio of total liabilities to total assets; *RET* is the square root of the absolute value of the stock returns; ***, **, *denote 2-tailed significance at the 1, 5 and 10% levels, respectively

Table IV.
The impact of IFRB-4 on information asymmetry for IFIs

RET is positive. Like prior studies (Smith and Watts, 1992; Hayes and Lundholm, 1996; Healy *et al.*, 1999; Jensen, 1986), the results suggest that highly leveraged firms disclosure less information, firms with higher growth opportunities firms and more profitable firms to disclose more information. As a result, information asymmetry among investors is higher for leveraged firms, while it is lower for higher growth and more profitable firms. Unlike our prediction, the coefficient on SIZE is negative, indicating that larger firms disclose less information than smaller firms. One possible reason for the coefficient on SIZE could be that larger firms disclose less information to protect their proprietary information from competitors.

Overall, the results in Table IV provide evidence supporting our first hypothesis that information asymmetry among investors is lower in the post-IFSB-4 period than before. This finding indicates that the standard has increased transparency on average. The results are consistent with previous analytical studies that have predicted greater quality accounting information disclosure practices reduces information asymmetry among investors (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994). Our results are also consistent with prior empirical studies that have documented higher quality disclosures are associated with greater liquidity and lower information asymmetry among investors (Cheng *et al.*, 2006; Daske *et al.*, 2008; Healy *et al.*, 1999).

5.3. Results of tests of H2
Table V presents the regression results for equation (2). The results of the pooled OLS regression model reported in Column 1 show that the estimated coefficient on $ISF \times POST\_IFSB4$ is positive and significant ($\beta_3 = 8.813$; t = 19.84). Column 2 shows the results when including industry dummies in the regression model (i.e. industry-fixed-effects). The estimated coefficient on $POST\_IFSB4$ is positive and significant ($\beta_3 = 12.499$; t = 29.47). The summation of coefficients on ISF (i.e. β_1) and $ISF \times IFSB4$ (i.e. β_3) is positive and

Variables	Predicted sign	Dependent variable: INFO_ASY	
		I	II
ISF	±	7.284*** (19.44)	5.331*** (14.50)
POST_IFSB4	+	−5.628*** (−33.08)	−8.841*** (−53.29)
ISF × POST_IFSB4	+	8.813*** (19.84)	12.499*** (29.47)
MTB	±	−0.014*** (−11.15)	−0.006*** (−4.63)
SIZE	±	−2.291*** (−68.14)	−0.420*** (−10.19)
LEVERAGE	±	−15.093*** (−52.27)	1.726*** (4.04)
RET	±	141.320*** (54.21)	141.478*** (57.49)
INTERCEPT	±	−75.972*** (−29.00)	
Industry-fixed-effects		No	Yes
R^2		4.5%	15%
No. of Observations		395,670	395,670

Notes The table reports regression coefficient estimates and (in parentheses) *t*-statistics; industry-fixed-effects are included in the regression reported in columns II of the table; *INFO_ASY* is the square root of number of shares traded divided by the number of shares outstanding for such firms; *POST_IFSB4* is an indicator variable captures whether the fiscal year is after the adoption of IFSB-4, and takes the value of 1 for fiscal years ending after the adoption of IFSB-4, and 0 otherwise; *ISF* is an indicator variable captures whether the firm is an Islamic institute, and takes the value of 1 for firms that are classified as Islamic institutions and 0 otherwise; *MTB* is the ratio of firms' market value of equity to book value; *SIZE* is the natural logarithm of the market value of equity; *LEVERAGE* is the ratio of total liabilities to total assets; *RET* is the square root of the absolute value of the stock returns; ***, ** and * denote 2-tailed significance at the 1, 5 and 10% levels, respectively

Table V.
The impact of IFRB-4 on information asymmetry for IFIs vs conventional firms

significant ($\beta_{1 + }\beta_3 = 16.097$; $F = 4{,}314$; $p < 0.01$). These results indicate that information asymmetry after the implementation of IFSB4 is lower for Islamic than conventional financial institutions. The sum of coefficients on *ISF* (i.e. β_1) and *ISF* × *IFSB4* (i.e. β_3) after controlling for industry differences is also positive and significant ($\beta_{1 + }\beta_3 = 17.83$; $F = 4{,}759$; $p < 0.01$). This result indicates that information asymmetry after the implementation IFSB4 is lower for Islamic than conventional financial institutions.

Overall, the results in Table V provide evidence supporting our second hypothesis that information asymmetry after the implementation of IFSB-4 is lower for Islamic than conventional financial institutions by promoting greater transparency and market discipline for the former. These results imply that strengthening disclosure requirements with appropriate Islamic accounting standards may help market participants make better-informed decisions. The results are consistent with previous studies that have predicted and showed higher quality disclosures reduce the information asymmetry among investors (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994; Cheng *et al.*, 2006; Daske *et al.*, 2008; Healy *et al.*, 1999).

5.4 Sensitivity tests
We conducted a number of additional analyses to test the robustness of our findings. First, we investigate whether taking into account the financial crisis period affects our results. Following prior studies, we excluded years classified as crisis years (i.e. between 2007 and 2009). We find results that a consistent with our main findings. Specifically, the results reported in Column I of Table V show that the coefficient on POST_IFSB4 is positive and significant ($\beta1 = 2.225$; $t = 3.83$). The results reported in Column II of Table VI show that the estimated coefficient on ISF × POST_IFSB4 is still positive and significant ($\beta3 = 10.142$; $t = 9.91$). The sum of coefficients on ISF (i.e. $\beta1$) and ISF × IFSB4 (i.e. $\beta3$) is also positive and significant ($\beta1 + \beta3 = 8.286$; $p < 0.01$). This result indicates that information asymmetry

Variables	Predicted sign	Dependent variable: *INFO_ASY*	
		I	II
ISF	±		13.625*** (15.08)
POST_IFSB4	+	2.25*** (3.83)	−1.86*** (−4.38)
ISF × POST_IFSB4	+		10.14*** (9.91)
MTB	±	0.376*** (6.02)	2.23*** (36.14)
SIZE	±	−4.23*** (−32.58)	−0.846*** (−6.97)
LEVERAGE	±	−34.94*** (−28.94)	−37.36*** (−55.54)
RET	±	4.28 (1.21)	33.66*** (15.94)
INTERCEPT	±	20.46*** (47.96)	60.46*** (67.96)
R^2		11.71%	6.8%
No. of Observations		45,940	64,623

Notes: The table reports regression coefficient estimates and (in parentheses) *t*-statistics; observations from 2007 to 2009 are excluded; *INFO_ASY* is the square root of number of shares traded divided by the number of shares outstanding for such firms; *POST_IFSB4* is an indicator variable captures whether the fiscal year is after the adoption of IFSB-4, and takes the value of 1 for fiscal years ending after the adoption of IFSB-4, and 0 otherwise; *ISF* is an indicator variable captures whether the firm is an Islamic institute, and takes the value of 1 for firms that are classified as Islamic institutions and 0 otherwise; *MTB* is the ratio of firms' market value of equity to book value; *SIZE* is the natural logarithm of the market value of equity; *LEVERAGE* is the ratio of total liabilities to total assets; *RET* is the square root of the absolute value of the stock returns; ***, ** and * denote 2-tailed significance at the 1, 5 and 10% levels, respectively

Table VI.
IFRB-4, information asymmetry and IFIs–excluding 2007-2009 observations

after the implementation of IFSB4 is lower for Islamic than conventional financial institutions.

To test whether the results are not driven by the differences across countries, we repeat the regression analyses after controlling for countries. We find similar results after controlling for countries in our analyses (untabulated). Finally, we test our analyses using annual average of daily turnover as a measure of information asymmetry. Untabulated results show that the findings are robust to this.

Overall, the results are consistent with prior studies that have documented higher quality disclosure reduces the information asymmetry among investors (Diamond, 1985; Diamond and Verrecchia, 1991, among others).

6. Conclusion

In this study, we examined whether mandatory accounting information disclosure as required by IFSB-4 influences market liquidity and information asymmetry among investors in the six GCC member countries, namely, Bahrain, Oman, Kuwait, Saudi Arabia, Qatar and the UAE. In addition, we investigated whether the influence of IFSB-4 on market liquidity and information asymmetry varies between Islamic and conventional financial institutions.

Following previous studies, we predicted that information asymmetry is lower after the implementation of information disclosure as required by IFSB-4. Moreover, we predicted that information asymmetry after the implementation the standard is lower for Islamic than conventional financial institutions.

Consistent with our predictions, we found that after the implementation of IFSB-4, the information asymmetry is lower, thereby increasing average transparency. We also found that information asymmetry after the implementation of IFSB-4 is lower for Islamic than conventional financial institutions. This finding implies that the standard affects IFIs more than conventional ones.

This study contributes to the literature in several ways. First, while previous research has extensively examined the consequences of disclosure levels for firms in developed countries, this study takes a first step to fill evident gaps in the literature by exploiting a unique setting that is often ignored by accounting researchers. This helps to widen our knowledge on accounting practices across the globe. Second, previous studies suggested that there is a need for further research on Islamic accounting standards. This study accordingly provides new empirical evidence on the effects of Islamic accounting standards on market liquidity and information asymmetry.

This study is subject to a number of limitations. First, owing to data availability, we were unable to use other proxies of information asymmetry (e.g. bid-ask spreads) and adoption of IFSB No. 4 (e.g. self-constructed disclosure index). Second, although we controlled for a number of different firm-specific characteristics, our results may have been influenced by other macro-economic factors. Future research might gather better and more extensive data to address these issues. Finally, although the six GCC member countries share several common characteristics (such as cultural, social and religion), there are differences in regulatory policies and political circumstances. Therefore, it is worth examining the differences in the level of compliance of IFAB No. 4 across these countries.

Note

1. We use "market liquidity and information asymmetry" and "information asymmetry" interchangeably.

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