

Does Islamic banking increase the liquidity of stocks?

Gregoriou, Andros; Gupta, Jairaj; Healy, Jerome

DOI:

[10.1016/j.intfin.2016.03.001](https://doi.org/10.1016/j.intfin.2016.03.001)

License:

Creative Commons: Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)

Document Version

Peer reviewed version

Citation for published version (Harvard):

Gregoriou, A, Gupta, J & Healy, J 2016, 'Does Islamic banking increase the liquidity of stocks? An application to the Kingdom of Bahrain', *Journal of International Financial Markets, Institutions and Money*, vol. 42, pp. 132-138. <https://doi.org/10.1016/j.intfin.2016.03.001>

[Link to publication on Research at Birmingham portal](#)

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.

Accepted Manuscript

Title: Does Islamic banking increase the Liquidity of Stocks?
An Application to the Kingdom of Bahrain

Author: Andros Gregoriou Jairaj Gupta Jerome Healy

PII: S1042-4431(16)30005-1
DOI: <http://dx.doi.org/doi:10.1016/j.intfin.2016.03.001>
Reference: INTFIN 850

To appear in: *Int. Fin. Markets, Inst. and Money*

Received date: 23-11-2014
Revised date: 3-3-2016
Accepted date: 5-3-2016



Please cite this article as: Gregoriou, A., Gupta, J., Healy, J., Does Islamic banking increase the Liquidity of Stocks? An Application to the Kingdom of Bahrain, *Journal of International Financial Markets, Institutions and Money* (2016), <http://dx.doi.org/10.1016/j.intfin.2016.03.001>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Does Islamic banking increase the Liquidity of Stocks?
An Application to the Kingdom of Bahrain.

Andros Gregoriou

Brighton Business School

University of Brighton

Brighton, BA2 4AT, UK

a.gregoriou@brighton.ac.uk

Jairaj Gupta

Birmingham Business School

University of Birmingham

Birmingham, B15 2TY, UK

Jerome Healy

Brighton Business School

University of Brighton

Brighton, BA2 4AT, UK

March 2016

Abstract:

This paper explores liquidity effects following the merger and acquisition between Al Salam Bank Bahrain and a conventional bank post the financial crises. We find evidence of a sustained increase in the liquidity of the stocks as a result of the change from Conventional to

Islamic banking. The empirical findings are consistent with the information cost / liquidity hypothesis, which states that investors demand a lower premium for holding stocks with relatively more available information. Our results suggest that Islamic banking stimulates trading and growth of the financial sector following financial turmoil.

JEL Classifications: G10, G14.

Keywords: Islamic banking, Liquidity, Financial Crises, Mergers and Acquisitions.

Introduction

The recent global financial crises (2007-2009) referred to by the media as the credit crunch has resulted in customers losing confidence in the conventional banking system used throughout the world. As a result of this, there has been an emergence of Western financial institutions changing their infrastructure into Islamic banks post the financial crises. The rationale for this change in operation is because Islamic banks were more equipped to deal with the financial crises than Western banks. This is because there are benefits of the Sharia-compliant financial products such as the mismatch of short-term, on-sight demandable deposit contracts with long-term uncertain loan contracts is mitigated with equity and risk

sharing elements. However, the advantages of Islamic banks have been questioned in the recent study conducted by Beck et al (2013), who discover minor differences between conventional and Islamic banks with respect to business orientation. This has raised a significant question mark on the potential benefits of Islamic banks.

Given the contradiction between financial theory and the empirical evidence on the advantages of Islamic banks, along with the lack of empirical literature in this very important issue, we feel that a comprehensive analysis of a change from conventional to Islamic banking is a vital piece of research that should be undertaken.

We have attempted to bridge the gap in the literature by analyzing a merger and acquisition that took place between an Islamic bank Al Salam Bank Bahrain (ASBB), and a conventional bank, Bahrain Saudi Bank (BSB). ASBB was incorporated in the Kingdom of Bahrain with a paid-up capital of BHD 149.7million and authorized capital of BHD 250 million. The bank was registered with Ministry of Industry and Commerce under Commercial Registration Number 59308 on 19 January 2006. The bank is licensed by the Central Bank of Bahrain as an Islamic retail bank and listed in the Bahrain Stock Exchange.

In 2009, ASBB acquired a 90.31% stake in BSB, a publicly listed commercial conventional bank in the Kingdom of Bahrain engaged mainly in retail banking. In January 2012, BSB shares were delisted from Bahrain Stock Exchange. On 26 February 2012, approval was granted by the CBB to convert BSB's license from retail conventional bank to retail Islamic bank. On 24 April 2012, ASBB acquired BSB and changed its operations from a conventional to an Islamic banking system.

The ASBB operates through ten retail branches in the Kingdom of Bahrain and offers a full range of Shari'a-compliant banking services and products. The activities of the bank include

managing profit sharing investment account, offering Islamic financing contracts, dealing in Shari'a-compliant financial instruments as principal/agent, managing Shari'a-compliant financial instruments and other activities permitted for under the CBB's Regulated Banking Service as defined in the licensing framework. The bank's ordinary shares are listed in the Bahrain Bourse and the Dubai Financial Market.

We are the first study to address the direct impact of changing from a conventional to an Islamic banking system by examining the market liquidity effects of the ASBB stocks before and after it changed from a western to an Islamic banking operation. For robustness we implement two alternative measures of liquidity costs, the relative and effective bid-ask spread. The relative spread is defined as the ask price minus the bid price, divided by the midprice (the average of the bid and ask prices). As Lee and Ready (1991) point out the problem with the relative spread is that it can be regarded as an inaccurate measure of liquidity because many trades occur at prices within the bid and ask price. Therefore, in order to obtain a more accurate measure of the market liquidity, we follow the methodology in Heflin and Shaw (2000) and Hegde and McDermott (2003) and compute the effective bid-ask spread. The effective bid-ask spread is computed as twice the absolute value of the difference between the transaction price and the midprice in effect at the time of the trade.

Our findings show a significant increase in the liquidity of ASBB after adoption of an Islamic banking system. In addition, we show that the increase in liquidity is maintained over a three-month post-merger trading period. Therefore, as the increase in liquidity spans over a three month period, we can say that there is a long-term improvement in the liquidity of the ASBB as a result of the adopting an Islamic banking approach.

The remainder of the paper is organized in the following way. Section 2 describes the data and the methodology. Section 3 presents the analysis of both the short-term and long-term

effects of trading before and after the implementation of Islamic banking for ASBB stocks. Finally, Section 4 concludes.

2. Data and Methodology

2.1 Data

We analyze the impact of the acquisition of BSB by ASBB which changed the infrastructure from a western to an Islamic banking operation. The event date of the takeover and the subsequent operation of an Islamic banking financial service was on the 24th April 2012. Therefore in our event study the pre (post) takeover date is before (after) 24th April 2012. Daily stock returns, daily trading volume and shares outstanding are obtained for ASBB from the Bahrain Bourse stock market.

2.2 Methodology

We begin our empirical estimates with the use of an event study surrounding the event day concerning the pre and post takeover trading of the ASBB stocks listed on the Bahrain Bourse stock market. We define the event (i.e. day 0) as the 24th April 2012 for the pre and post takeover trading period. We use the traditional market model which was first established by Brown and Warner (1985) and was subsequently used by most previous research on event studies (see among others Hegde and McDermott, 2003, Denis et al, 2003, and Gregoriou and Ioannidis, 2006). The market model involves a procedure with a value-weighted market index and market model parameters estimated over the time period 90 days before and after the

event date in order to calculate excess returns around the event dates. The excess returns obtained from the market model are aggregated through event time to obtain cumulative abnormal returns (CAR).¹

3. Empirical Results

3.1 *Abnormal Returns of ASBB after becoming an Islamic Bank*

In order to investigate the impact of short-term effects of the adoption of Islamic banking on ASBB, we compute abnormal returns and changes in liquidity around a five day event window, [-5, +5]. We utilize the standard event methodology outlined in the previous section of the paper for each event day. The results for the event window [-5, +5] are presented in Panel A of Table 1. Panel A indicates that stock returns of ASBB are affected by the adoption of Islamic Banking. Significant positive AARs (Average Abnormal Returns) persist over the 11 day event window, with the largest average return of 0.88% occurring on the first date after the change in banking philosophy (event day 1). The CAR from day -5 to +5 of 5.04% is distinguishable from zero with a t-statistic of 2.50. The short term abnormal returns results suggest that positive excess returns are gained by investors on the Bahrain Bourse stock market due to the ASBB takeover of BSB.²

If the change to Islamic banking has improved the sustained liquidity of ASBB stocks then we would expect the abnormal returns witnessed in Panel A of Table 1 to persist over time. In order to test this hypothesis we compute the CAR of ASBB stocks over a three month event window [0, +90] after the adoption of Islamic banking. The results are presented in Panel B of Table 1. We observe that there are significant CARs for up to 90 trading days following the change to Islamic banking. Therefore, from the results in Table 1 we can report evidence

¹ For a more detailed explanation of the market model see Brown and Warner (1985).

² We also computed the CAR over the event windows [-4, +4], [-3, +3], [-2, +2], [-1, +1] and [0, +5]. The results are quantitatively similar to the event window that is reported, [-5, +5]. The results over the alternative event windows are not reported and are available upon request.

of permanent stock price increases in ASBB after the company changed its philosophy to Islamic banking.

[INSERT TABLE 1 HERE]

3.2 *Trading Volume Effects of Islamic banking on ASBB*

To determine the possible presence of liquidity effects we proceed with the analysis of the impact of the adoption of Islamic banking on the trading volume of ASBB securities. We test for the presence of abnormal trading volume in the event period by employing the following regression model.

$$Volume_t = \alpha + \sum_{-5}^{+5} D_i \beta_i + \varepsilon \quad \text{for } t = -90, +5 \quad (1)$$

Where $Volume_t$ is the logarithm of trading volume for the stock at day t . α captures the variation in trading volume that is independent of time. D_i are dummy variables for each trading day in the event window $[-5, +5]$. The coefficients of the eleven dummy variables, β_i capture the abnormal trading volume over the event window, $[-5, +5]$. ε is a random disturbance term with a mean of zero and a variance of σ^2 , α , and β_i are parameters to be estimated. Equation (1) is estimated by a ordinary least squares regression using the White (1980) heteroscedastic consistent covariance matrix. The results of equation (1) can be seen in Panel A of Table 2.

The positive and significant sign of the eleven dummy variables confirms that there is a dramatic increase in trading volume in the ASBB after the introduction of Islamic banking. For example, 5 days before the event (i.e. event day -5) the coefficient on the dummy, β_{-5} is 0.346 and significant with a t statistic of 2.93. The abnormal volume continues to increase and reaches its peak on the day of the event (i.e., event day 0). On this event day β_0 is 0.91 and highly significant with a t statistic of 3.76, indicating that trading volume has substantially risen for the company after adaption of Islamic banking. Following the philosophy change to Islamic banking, the abnormal volume decreases from its peak but continues to be positive and significant throughout the post event period. The regression in

equation (1) also passes the normality test, suggesting that the abnormal volume empirical estimates are not due to possible outliers in the data.

In order to analyze changes in the long term trading volume of ASBB stocks preceding Islamic banking, we construct a Post/Pre ratio of standardized trading volume in the post-crises period [0, +90] to the standardized volume in the pre-crises period [0, -90]. The results of the long term changes in trading volume are reported in Panel B of Table 2. We can see that the mean (median) Post/Pre ratio of standardized trading volume is 2.28 (2.21) with a corresponding t statistic of 4.63. This finding suggests that the introduction of Islamic banking has resulted in a permanent rise in trading volume of ASBB securities.³

[INSERT TABLE 2 HERE]

In the preceding section of the paper we attempt to explain the increase in the stock prices and the significant increase in aggregate trading volume of ASBB stocks, after the change to Islamic banking, with the use of the information cost / liquidity hypothesis.

3.3 *Information Cost Liquidity Hypothesis*

The information hypothesis was first established by Van Horne (1970) in the context of new listings on the New York Stock Exchange, stating that listing signals good news about firms' future prospects. Since the work by Von Horne (1970), researchers such as Schleifer (1986), Dhillon and Johnson (1991), Beneish and Gardner (1995), Hegde and McDermott (2003) and Gregoriou and Ioannidis (2006) have examined whether information about the investment appeal of a stock is provided by news of listing changes. They all report significant improvement in stock performance after inclusion in the index.

From the previous section we discovered that there was an increase in trading volume when the ASBB stocks were traded post the introduction of Islamic banking. As a result of the

³ We also analyzed the Post/Pre ratio of standardized trading volume over a 20, 30, 40 and 60 event day window. The estimates are very similar to the 90 day event window reported in Panel B of Table 2. The results are not shown but are available upon request.

increase in trading volume, ASBB stocks could result in lower bid-ask spreads and higher market liquidity.

In order to analyze the impact of Islamic banking on the short term liquidity of ASBB stocks, we construct ratios of the daily average quoted, relative and effective bid-ask spreads over various time interval event windows in the pre and post Islamic banking period. The quoted bid-ask spread is constructed because this measure of spread encapsulates the economic significance of the spread to the market-maker, (Branch and Feed, 1977). The relative bid-ask spread is computed as the ask price minus the bid price divided by the midprice. However, as pointed out by Lee and Ready (1991) the relative bid-ask spread has two potential shortcomings. First, it overstates the trading costs of a stock because it fails to account for the tendency of prices to rise following a purchase and fall following a sale. Second, it can be argued that the relative bid-ask spread is an inappropriate measure of stock liquidity due to the fact that trades frequently occur within the ask and bid prices. In our dataset, for instance, approximately 32% of trades occur within the midprice. Therefore, in order to account for these two shortcomings we also compute the effective bid-ask spread, defined as twice the absolute value of the difference between trade price and the prevailing midprice. There is however a potential problem with the use of either the relative or the effective bid-ask spread. The problem is that both measures of bid-ask spread will automatically increase, due to the increase in the midprice after the financial crises, witnessed in Table 1. Therefore, for completeness we also compute the quoted bid ask spread defined as the ask price minus the bid price, pre and post the Islamic banking trading period of ASBB Stocks.

In order to provide a comparison of the liquidity of ASBB stocks pre and post the introduction of Islamic banking, we construct ratios of daily relative, effective and quoted bid-ask spreads over various event time intervals to their equivalents in the pre-Islamic banking period over trading days [0, -90]. The results of the changes in liquidity of ASBB

Stocks pre and post Islamic banking trading can be seen in Table 3. There is clear evidence from Table 3 that spreads are significantly reduced after the exposure to Islamic banking. For example, in the [-5, +5] event window the mean and median quoted bid-ask spread ratios are 0.84 and highly significant. This indicates that spreads are significantly reduced over the 11 trading day period centered on the first day post the adaptation of Islamic banking. The results are robust across all liquidity measures.

The significant spread reductions over the longer event time intervals such as, [0, +60] and [0, +90] indicate that the reduction in trading costs is permanent. This implies that the improvement in liquidity of ASBB stocks as a result of the change to Islamic banking is permanent.

[INSERT TABLE 3 HERE]

3.4 Multivariate Analysis of Long-Term Changes in Market Liquidity

It is possible that the univariate analysis undertaken thus far in the study are based on factors unrelated to the impact of Islamic banking on ASBB securities. To control for these external factors and improve the power of the econometric analysis, we perform a multivariate analysis of the bid-ask spread. The multivariate analysis is undertaken in the form of a multivariate regression model with some control variables. This is because Gregoriou et al, (2005) report that the bid-ask spread increases with return volatility and decreases with stock price and trading volume, in the London Stock Exchange.⁴ We estimate the following log linear regression model where the regression parameters represent elasticities:

⁴ Atkins and Dyl (1997) report a similar relationship for the New York Stock Exchange.

$$Liquidity_t = \alpha_j + \beta_1 D_t + \beta_2 Volume_t + \beta_3 (Volume_t * D_t) + \beta_4 Price_t + \beta_5 StDev_t + \varepsilon_t$$

for $t = 1, 2$. (2)

Where $t=1$ corresponds to in the pre-Islamic banking trading period of ASBB stocks [0, -90], and $t=2$ corresponds to the post-Islamic banking trading period, [0, +90]. The dependant variable, $Liquidity_t$, corresponds to either the quoted, relative or effective bid-ask spread for the stock at time period t . $Volume$, $Price$ and $StDev$ represent the traded volume in shares, closing price and return volatility for the stock at time period t . The dummy variable, D_t is equal to 1 in the post-Islamic banking time period and is equal to 0, otherwise. We are mainly concerned with the change in the dummy variable, β_1 , and the change in the slope of trading volume as a result of trading post the introduction of Islamic banking, β_3 . All variables apart from the dummy, D_t , are expressed as natural logarithms.

The estimation of equation (2) with the use of ordinary least squares is displayed in Table 4. The first thing to report is that the model passes all the relevant diagnostic tests. The test for first order residual serial correlation is insignificant, suggesting that the regression does not suffer from autocorrelation. The residuals are also normally distributed signalling that the results of the model are not due to outliers in the data.

The R^2 indicates that 67% of the variation in market liquidity is accounted for in the model. The variables Price, Volume and Stdev have the predicted signs and are highly significant. A more important result is that the parameter β_1 is statistically significant whereas, the parameter β_3 is insignificant. The significance of D_t shows that the effective bid-ask spread decreases on average by 10.15% in the post-Islamic banking trading period, after controlling for the impact of trading volume, share prices and volatility. Also the coefficient estimates on

the trading volume ($Volume_t$) is significant. This implies that a one percent increase in mean trading volume ($Volume_t$) is associated with a decrease of 8.12% in the average effective bid-ask spread in the pre-Islamic banking trading period. The insignificance in the ($Volume_t * D_t$) interaction term signals that this increase in trading volume is maintained in the post-Islamic banking trading period.

[INSERT TABLE 4 HERE]

From our findings we observe that after the introduction of Islamic banking, there was a significant permanent increase in the trading volume and the stock price liquidity of ASBB Stocks. This finding holds in both a univariate and multivariate framework even when the impact of share prices, trading volume and volatility of the stocks has been accounted for.

4. Conclusion

The recent global financial crises has resulted in customers losing confidence in the conventional banking system used throughout the world. As a consequence of this many financial institutions have changed their infrastructure from a Western to an Islamic banking approach. In this paper we assess the impact of the financial crises on the change in banking philosophy, by examining ASBB stocks before and after the change from conventional to an Islamic banking philosophy. Our empirical findings reveal that there is a long term enhancement in liquidity of ASBB stocks, post the Introduction of Islamic banking that persists over a 3 month trading interval. We also find permanent increases in the stock price and trading volume of ASBB stocks after the adoption of Islamic banking. Furthermore we observe significant decreases in bid-ask spreads in the post-Islamic banking trading period, after controlling for the impact of stock prices, trading volume and volatility of returns.

Our results are extremely striking because they provide overwhelming evidence that a change in banking philosophy from Western to Islamic provides financial institutions with distinct

advantages. This is not transparent from the previous literature on Islamic banking, who find that banking philosophy is not related to company performance. We believe that our results are different because we are the only study to directly test the impact of a change from Western to Islamic banking on the same financial institution. Given that we are the first study to do this and the lack of literature on Islamic banking post the financial crises, we believe the findings in our paper cannot be ignored.

Finally, the permanent rise in liquidity of ASBB stocks could result in increase in firm value. This is because it may be less costly for them to borrow, issue capital or issue public equity after the increase in liquidity resulting from the introduction of Islamic banking. Extensions that focus on valuation of ASBB stocks after the adoption of Islamic banking are promising avenues for future research.

References

Atkins A.B. and E.A. Dyl. 1997. Transactions Costs and Holding Periods for Common Stocks. *Journal of Finance*, 1, 309-325.

Beck, T, A.D, Kunt and O.Merruche. 2013. Islamic vs. conventional banking: Business model, efficiency and stability. *Journal of Banking and Finance*, 37, 433-447.

Beneish, M. D. and Gardner, J. C. 1995. Information Costs and Liquidity Effects from Changes in the Dow Jones Industrial Average. *Journal of Financial and Quantitative Analysis* 30, 135-157.

Branch, B. and W. Freed. 1977. Bid-ask spreads on the AMEX and the big board. *Journal of Finance*. 32, 159-163.

Brown, S. and Warner, J. 1985. Using Daily Stock Returns: The Case for Event Studies. *Journal of Financial Economics*, 14, 3-31.

- Denis, D.K. J.J. McConnell, A.V. Ovtchinnikov, and Y. Yu. 2003. S&P 500 Index Additions and Earnings Expectations. *Journal of Finance*, LVIII, 1821-1840.
- Dhillon, U. and Johnson H. 1991 Changes in the Standard and Poor's 500 List, *Journal of Business* 64, 75-85.
- Gregoriou, A. and C. Ioannidis. 2006. Information Costs and Liquidity Effects from changes in the FTSE 100 List. *European Journal of Finance*, 12, 347-360.
- Gregoriou, A. C. Ioannidis, and L. Skerratt. 2005. Information Asymmetry and the Bid-Ask Spread: Evidence from the UK. *Journal of Business Finance and Accounting*, 32, 1801-1826.
- Heflin, F. and K.W. Shaw. 2000. Blockholder Ownership and Market Liquidity, *Journal of Financial and Quantitative Analysis*, 35, 621-633.
- Hegde, S.P. and J.B. McDermott. 2003. The Liquidity effects of revisions to the S&P 500 index: an empirical analysis. *Journal of Financial Markets*, 6, 413-459.
- Lee, C. M. and M. J. Ready. 1991. Inferring trade direction from intraday data. *Journal of Finance*, 46, 733-746.
- Shleifer, A. 1986. Do Demand Curves for Stocks Slope Down? *Journal of Finance* 41, 579-590.
- Von Horne, J.C. 1970. New Listings and their Price Behavior. *Journal of Finance*, 24, 783-794.
- White, H. 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test of heteroskedasticity. *Econometrica* 48, 817-838.

TABLES

Table 1. Abnormal Returns around the adoption of Islamic banking on ASBB stock trading.

The sample consists of ASBB stocks that were available to be traded before and after the introduction of Islamic banking. Abnormal returns (AR) are computed using the market model and the standard event study methodology. The estimation window for computing the market model parameters is the event time interval [-90, 90]. AR is tested for significance using a t-statistic.

Panel A. Short Term Abnormal Returns

Event Day	AR (%)	T test $H_0: AR=0$
-5	0.14	2.30**
-4	0.31	2.25**
-3	0.36	2.18**
-2	0.62	2.65**
-1	0.86	2.63**
0	0.42	3.24**

+1	0.88	3.01**
+2	0.64	2.67**
+3	0.39	2.20**
+4	0.30	2.16**
+5	0.12	2.09**
[-5, +5]	5.04	2.50**

Panel B. Long Term Abnormal Returns

Event Day	AR (%)	T test $H_0: AR=0$
[0, +10]	0.72	2.22**
[0, +20]	0.65	2.13**
[0, +30]	0.55	2.21**
[0, +60]	0.43	2.13**
[0, +90]	0.31	2.16**

** Significant at 5% level.

Table 2. Trading Volume around the adoption of Islamic banking on ASBB stock trading.

Panel A. Short Term Abnormal Trading Volume.

The following regression model is estimated to investigate the changes in trading volume surrounding the dates of the introduction of Islamic banking ASBB securities.

$$Volume_t = \alpha + \sum_{-5}^{+5} D_i \beta_i + \varepsilon \quad \text{for } t = -90, +5$$

Where $Volume_t$ is the logarithm of trading volume for the stock at day t. D_i are dummy variables for each trading day in the event window [-5, +5]. The coefficients of the eleven dummy variables, β_i capture the abnormal trading volume over the event window, [-5, +5]. ε is a random disturbance term with a mean of zero and a variance of σ^2 , α and β_i are parameters to be estimated. NORM (2) is the p-value for the Jarque-Bera normality test.

Parameter	Estimate	T statistic
α	0.125	2.63**
β_{-5}	0.346	2.93**
β_{-4}	0.476	2.83**

β_{-3}	0.584	2.26**
β_{-2}	0.672	2.23**
β_{-1}	0.836	2.92**
β_0	0.91	3.76**
β_{+1}	0.84	2.32**
β_{+2}	0.632	2.82**
β_{+3}	0.532	2.76**
β_{+4}	0.493	2.01**
β_{+5}	0.282	2.90**
Adjusted R ² = 0.65		
NORM (2) = 0.47		

**Significant at the 5% level.

Table 2. Trading Volume **around** the adoption of Islamic banking on ASBB stock trading.

Panel B. Long Term Trading Impact of Trading Volume on ASBB Stocks after the Introduction of Islamic Banking

The sample consists of ASBB stocks that were traded before and after the introduction of Islamic banking. Standardized trading volume is defined as daily trading volume in shares divided by the total Bahrain Bourse trading for the same day. Standardized trading volumes are computed for the pre Islamic banking period [0, -90] and the post Islamic banking period [0, +90]. The t statistic is constructed to test the null hypothesis that the standardized trading volume is unchanged in the pre- Islamic banking period as compared with the post-Islamic banking period.

Variable	Standardized Trading Volume
Mean (Pre-internet)	0.00657%
Mean (Post-internet)	0.0150%
Median (Pre-internet)	0.00652%
Median (Post-internet)	0.0144%
Mean (Post/Pre Ratio)	2.28
Median (Pre/Post Ratio)	2.21
T Test	4.63**

** Significant at 5% level.

Table 3. Short and Long Term Effects of ASBB stocks on Stock Market Liquidity after the introduction of Islamic banking

Stock market liquidity is measured by the quoted, relative and effective bid-ask spreads of ASBB stocks after the introduction of Islamic banking. Quoted bid-ask spread is defined as the ask price minus the bid price. Relative bid-ask spread is defined as the ask price minus the bid price divided by the quoted midprice. Effective bid-ask spread is defined as is defined as twice the absolute value of the difference between the transaction price and the midprice in effect at the time of the trade. All spread ratios are computed as the ratio of the average bid-ask spread over the indicated event time period to the average bid-ask spread measure over the pre Islamic banking trading period of ASBB Stocks, [0, -90]. The null hypothesis that the mean of the reported ratio is equal to one is tested using a standard t statistic.

Event Time Interval	Quoted Spread (%), Mean (Median)	Relative Spread (%), Mean (Median)	Effective Spread (%), Mean (Median)
[0, 0]	0.85 (0.86)	0.81 (0.80)	0.82 (0.81)
T Test	-4.15**	-4.23**	-4.19**
[-1, +1]	0.84 (0.84)	0.82 (0.81)	0.83 (0.82)
T Test	-4.01**	-4.04**	-3.99**
[-2, +2]	0.85 (0.86)	0.81 (0.80)	0.82 (0.81)
T Test	-4.31**	-4.29**	-4.25**

[-3, +3]	0.86 (0.86)	0.82 (0.81)	0.83 (0.82)
T Test	-3.87**	-3.99**	-3.95**
[-4, +4]	0.85 (0.86)	0.81 (0.81)	0.82 (0.82)
T Test	-4.13**	-4.09**	-4.04**
[-5, +5]	0.84 (0.84)	0.82 (0.81)	0.83 (0.83)
T Test	-3.90**	-3.92**	-3.87**
[0, +10]	0.88 (0.87)	0.84 (0.84)	0.85 (0.84)
T Test	-3.84**	-3.82**	-3.80**
[0, +30]	0.89 (0.88)	0.86 (0.85)	0.87 (0.88)
T Test	-3.76**	-3.70**	-3.72**
[0, +60]	0.93 (0.92)	0.90 (0.89)	0.91 (0.90)
T Test	-2.31**	-2.22**	-2.24**
[0, +90]	0.96 (0.95)	0.94 (0.93)	0.95 (0.94)
T Test	-2.06**	-2.02**	-2.00**

** Significant at 5% level.

Table 4. A multivariate analysis of the long-term impact on stock market liquidity.

The sample consists of ASBB stocks that were traded before and after the Introduction of Islamic banking. A regression model estimated with the use ordinary least squares is used. The model is used to determine whether the average market liquidity of the stocks improves following Islamic banking after controlling for average stock price, trading volume and volatility of stock returns. In addition, β_3 tests if the slope coefficient on trading volume has changed following the introduction of Islamic banking. The regression model has the following specification:

$$Liquidity_t = \alpha_j + \beta_1 D_t + \beta_2 Volume_t + \beta_3 (Volume_t * D_t) + \beta_4 Price_t + \beta_5 StDev_t + \varepsilon_t$$

for $t = 1, 2$.

Where $t=1$ corresponds to the pre Islamic banking trading of ASBB Stocks, $[0, -90]$, and $t=2$ corresponds to the post Islamic banking trading period, $[0, +90]$. The dependant variable, *Liquidity*, corresponds to either the quoted, relative or effective bid ask spread for the stock at time period t . Quoted bid-ask spread is defined as the ask price minus the bid price. Relative bid-ask spread is defined as the ask price minus the bid price divided by the quoted midprice. Effective bid-ask spread is defined as is defined as twice the absolute value of the difference between the transaction price and the midprice in effect at the time of the trade.

Volume, *Price* and *StDev* represent the traded volume in shares, closing price and return volatility for the stock at time period t . The dummy variable, D_t is equal to 1 in the post Islamic banking time period and is equal to 0, otherwise. All the variables apart from D_t are expressed as natural logarithms. α is the p value of the constant term. AR(1) is the p value of the first order Lagrange Multiplier test performed on the residuals. NORM (2) is the p-value for the Jarque-Bera normality test.

Variables	Quoted Bid-Ask Spread	Relative Bid-Ask Spread	Effective Bid-Ask Spread
Constant	-0.886 (-10.23)**	-0.923 (-11.24)**	-0.925 (-11.26)**
D	-9.15 (-11.52)**	-9.63 (-12.98)**	-10.15 (-13.63)**
Volume	-7.31 (-8.93)**	-7.16 (-8.97)**	-8.12 (-8.94)**
(Volume*D)	0.024 (1.04)	0.025 (1.05)	0.026 (1.03)
Price	-2.361 (-70.21)**	-2.357 (-70.23)**	-2.350 (-70.33)**
StDev	0.782 (17.23)**	0.791 (18.21)**	0.790 (18.26)**
α	[0.00]	[0.00]	[0.00]
R^2	0.571	0.574	0.670
NORM (2)	[0.231]	[0.234]	[0.237]
AR(1)	[0.421]	[0.424]	[0.427]

** Significant at the 5% level.

Does Islamic banking increase the Liquidity of Stocks?
An Application to the Kingdom of Bahrain.

Research Highlights:

- We explore liquidity effects of a merger of an Islamic and a conventional bank.
- We discover increases in liquidity due to the change in the banking system.
- Our results suggest that Islamic banking stimulates trading and growth.

Accepted Manuscript