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Financial Stability of Islamic Banks in the MENA Countries during Financial Crisis and Political Uncertainty: An Emperical Investigation

Ameni Ghenimi[1]*, Khaled Oweis[2] and Mohamed AO[3]

[1]*Economic Sciences and Management of Tunisia, Tunisia*
[2]*Accounting Department Rafha Community College, Northern Border University, Kingdom of Saudi Arabia*
[3]*Accounting Department College of Business Administration, Northern Border University, Kingdom of Saudi Arabia*

Abstract

The recent financial crisis has triggered a series of failures of many conventional banks and led to the rise of the interest in the Islamic banks. In this study, we seek to address the following question: What was the effect of the financial crisis and the political uncertainty on the financial stability of both Islamic and conventional banks? The conditional variance (volatility) of returns was used to measure financial stability. The various GARCH models were used to estimate volatility due to their ability to take into account the leverage effect; however they depend on the log likelihood results. The study covers a sample of 11 Islamic banks (IBs) and 17 conventional banks (CBs) for three major regions (the GCC, the Mediterranean and the MENA) for the period from (09/11/ 2005 to 09/12/2013). Our major findings are as follows. First, we document a significant increase in the volatility of conventional banks (CBs) during the period of the financial crisis whereas this crisis has had no significant effect on the volatility in Islamic banks (IBs). Second, the volatility of IBs has increased during the recent political turmoil and that of their conventional counterparts remain low in the Golf countries and the MENA region but more than in the Mediterranean region, this increase remained very moderate. In general, the findings are important for the understanding of the role of financial crisis and the Arab spring on the financial stability of IBs and CBs, suggesting that they are of great significance to investors.

Keywords: Islamic banks; Conventional banks; Financial crisis; Arab spring; Political uncertainty; Financial stability

Introduction

The subprime mortgage crisis erupted in the USA in 2007 and the failure of Lehman brothers in September 2008 caused an economic panic throughout the world. This crisis has triggered a series of failures of many conventional banks. The economy was also affected by the global credit crisis followed by the political crisis of 2010. However, a major political event like this can also have an explosive effect on the stock market volatility because of its economic and social implications. According to the OCDE [1], the financial crisis has shown that banks' funding structure is important to their resilience. Although a financial or a political crisis severely affects stock returns of IBS and CBS, we assume that these two crises have different impacts on financial stability of IBS and CBS, or else the impact of a financial crisis on volatility of the stock returns of banks may be as high as that of a political crisis. Political uncertainty caused by unrest could manifest itself in stock market cycles and volatility reactions shaking international investors' confidence in the region. Furthermore, these crises also draw the attention to Islamic finance. Khan [2] argues that the theoretical model of Islamic banks can successfully fill the failure of conventional banks in maintaining stability. IBs are different from CBs because they operate upon the principles of the Islamic law which prohibits the payment or receipt of interest and encourage risk sharing [3]. More precisely, since Islamic financial products are based on the idea of sharing profit and loss, they are very attractive to the people who require financial services consistent with their religious beliefs. In light of the high specific nature of the financing tools used by Islamic banks, the risks they incur, the management methods, and the governance they use reflect very different realities to which conventional banks are subject. The financial crisis is an opportunity to test and compare financial stability between Islamic banks and their conventional counterparts. According to Shamshad Akhtar[1], IBs have illustrated a degree of stability to the recent crisis but have been impacted because of their higher exposure to real estate and limited reliance on risk sharing. To our knowledge, the only articles that analyzed the financial stability of IBs and CBs are Cihak and Hesse [4], and Boumediene and Caby [5]. These authors conclude that IBs contributed to financial and economic stability of CBs during the financial crisis.

This paper attempts to analyze and compare the effects of financial crisis and political uncertainty on the three regions in terms of financial stability of both groups of banks (share price volatility). Given the growing importance of all the MENA region in the world economy, in general, and the Islamic financial assets in particular, there is a pressing need for a rigorous research to examine the effects of the global financial crisis and the Arab Spring uprising in order to better understand the relationship between the financial crisis, political uncertainty and financial stability. Furthermore, this paper adds to the growing literature studying the determinants of financial stability. Several studies have examined financial stability during the financial crisis and no research has studied this theme during the financial crisis and the political crisis for each region separately at the same time. It remains relatively unclear whether and to what extent the financial crisis and the recent political turmoil have affected volatility of stock returns of

[1]The Ex-Vice-President of the World Bank for MENA in her speech during the 'Sympisium on Islamic Finance in Roma: Developments in MENA region', Bank Italia, Rome, Italy, November, 11th, 2009.

***Corresponding author:** Ameni Ghenimi, Economic Sciences and Management of Tunisia, Campus Universities, El Manar BP 248, El Manar II, 2092, Tunis, Tunisia, Tel: 216 74 279 169; E-mail: ameni.fsegs@gmail.com

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IBs and CBs. In this paper, we attempt to fill this gap by examining the volatility of the stock returns of IBs and CBs in three regions during the financial crisis and the Arab Spring movements. Firstly, we consider a matched sample of IBs and CBs for each region separately. Secondly, we use not only the various GARCH models as done by Boumediene and Caby [5], Al Ali and Yousfi [6], but also a multiplicative dummy variable in the best volatility model that assesses the impact of these crises on two groups of banks. Our matched data comprise the daily returns of 11 IBs and 17 CBs from three regions covered during the period 09/11/2005 to 09/12/2013 which enables us to assess the effect of both crises on the financial stability of IBs and CBs. The volatility of the stock returns of IBs and CBs was estimated using the GJR-GARCH model during the financial crisis and the political crisis in the Arab countries.

Our major findings are as follows. We find that IBs were more stable than their counterparts during the global financial crisis. It seems that CBs were operating with greater risk exposure than their Islamic peers during the crisis, however, during the political uncertainty; they saw their initially-low volatility increase during that period. Although this increase remained very moderate, CBs saw their volatility initially decline during the crisis. Therefore, it seems that both crises are different regarding the risk.

The structure of this paper is as follows, section 2 provides a short overview of the specifics of Islamic banking. Section 3 presents the literature review of the financial stability in IBs and CBs. The variables, the data and the econometric methodology are presented in section 4. Section 5 presents and discusses the empirical results. Finally, our concluding remarks are summed up in the last section.

Specific Characteristics of Islamic Banks

Many economists, such as Cihak and Hesse [4], Khan [2], Syed Ali [7] found two principles of transactions, the Mudharabah and Musharakah, as the only instruments of profit and loss sharing. Traditional banking intermediation is based on debt and allows the transfer of risk, whereas Islamic banking is based on the assets and risk sharing. The mechanisms allow Islamic banks to keep their net worth and avoid the imbalance of their balance sheets during the crises. On the liabilities side of the balance sheet, the Mudharabah transaction between the bank and customers is unlimited so that the management of the bank is free to invest money in what seems to comply with sharia.

On the asset side of the balance sheet, the funds are invested through a limited Mudharabah contract. The bank also accepts deposits in current accounts. Bank deposits can be divided into demand and time deposits. The total amount of these demand deposits is guaranteed, and current account depositors are aware that their deposits are used for risky projects. Two basic methods are offered by Islamic banks, the first depends on the profit and loss sharing and includes Musharakah and Mudharabah, and the second involves the sale and purchase of goods and services on credit. Islamic banks follow the sharia principles in their operations. The other types of Islamic financial modes, which are based on mark-up including (Murabaha, Ijaras, and Istisnaa), require that a real asset underlies the financial transaction. Consequently, financial assets and derivatives based on other debt financial assets cannot be traded. The linkage prevents the exposure of Islamic banks to speculative behavior that leads to instability. These funding models and the balance sheet structure inevitably have implications on Islamic banks' exposure to risk (default risk, solvency risk; liquidity risk).

On the income distribution side, Islamic banks distribute profits to investment depositors even when they return loss and pay the benefits of equity. Zainol and Kassim [8], Cevik and Charap [9] found that current practice does not make a clear distribution between the rights of shareholders and investment account holders.

Hence, in terms of capital, investment firms sell their capital to the public in the form of shares, and the shareholders have the right to control the direction of the company and exercise the right to vote. In Islamic banks, customers have no right to interfere with the management of the bank. Because of their engagements and the principle of sharing profits and losses, Islamic banks have better immunity to external shocks than conventional banks. Finally, IBs may not fully respect Shari'ah principles in their activities. For example, Chong and Liu [10] claim that Malaysian banks are not very different than conventional banks in terms of the adoption of the PLS principles.

Literature Review Related to Financial Stability

The stability of the banking system is important and therefore more attention should be given to the Islamic and Conventional banks after the period of the global financial crisis. Therefore, the literature that treated these issues is presented as follows:

Measurement indicators of financial stability can be divided into two groups: Measurement indicators by Z-score or GARCH (Table 1).

Data and Methodology

Data

Our dataset consists of daily prices for both conventional and Islamic banks from three regions, namely the GCC, the Mediterranean and the MENA over the period from 09/11/2005 to 9/12/2013. The dataset was gathered via DataStream [5]. The stock returns used to investigate banks' stability are calculated using the following formula:

$$R_t = \ln\left(\frac{p_t}{p_{t-1}}\right) \quad (1)$$

Where, P_t and P_{t-1} are the daily closing prices of the stocks index at time t and t-1. This choice is justified by the importance of shocks for the banking during this period.

Methodology

We adopt the generalized autoregressive conditional heteroscedasticity (GARCH) framework to examine whether, and to what extent, the financial crisis and political turmoil have affected the financial stability of both banks in the three regions. We perform inter-temporal and inter-bank comparison using the wilcoxon signed-rank test.

Measuring bank stability

The measurement of stability has a distinctive role in the operational framework of the financial system stability. It helps ensure the accountability of the authorities in charge and support the implementation of the chosen strategy to achieve the goal in real-time. The stability of banks is measured by the volatility of their returns on shares quoted on the stock exchange market. However, the level of bank stability is measured using the GARCH indicator (Generalized Autoregressive Conditional Heteroscedasticity). In the literature of Islamic banking, this indicator is used by Boumediene and Caby [5] Al-Ali and Yousfi [6].

Illing and Liu [11] observed that the GARCH method provided the best measure of stress on capital markets. This research uses a symmetric GARCH model and examines the asymmetric reactions of

Authors	Methodology	Objective	Results
Čihák and Hesse [4]	Model: Z-score Period: 1993 to 2004 Frequency: 77 Islamic banks and 397 commercials banks in Bahrain, Bangladesh, Brunei, Egypt, Gambia, Indonesia, Iran, Jordan, Kuwait, Lebanon, Malaysia, Mauritania, Pakistan, Qatar, Saudi Arabia, Sudan, Tunisia, United Arab Emirates, West bank and Gaza, and Yemen.	Studied the impact of Islamic banks on financial stability	The researchers found that (i) large commercial banks were financially more solid than large Islamic banks; (ii) small Islamic banks were financially more solid than conventional banks of the same size; and (iii) small Islamic banks tend to be financially stronger than large Islamic banks, which may reflect challenges of credit risk management in large Islamic banks.
Boumediene and Caby [5]	Model: GARCH, E-GARCH and GJR-GARCH Period: 2007-2009 Frequency: 14 Islamic banks and 14 commercials banks in UAE, Saudi Arabia, Bangladesh, Bahrain, Egypt, UK Bretagne, Kuwait, Pakistan, and Qatar	Examine the financial stability of Islamic banks during the subprime crisis.	The researchers showed that conventional banks were highly volatile than Islamic banks, and that Islamic banks were at least partially immune to the subprime crisis. These banks are not subject to the same risks as conventional banks.
Al ali and Yousfi [6]	Model: GARCH, E-GARCH and GJR-GARCH Period: 2005 to 2010 Frequency: ten conventional banks and one Islamic bank in Jordan	Investigated, measured and compare the financial stability of Jordanian Islamic and conventional banks in pre and post the financial crisis.	The researchers showed that Islamic bank were more stable than conventional banks, which may due to their links with the real economy. They recommended that Islamic banks in Jordan need to improve the branch network throughout the country, and conventional banks must open Islamic branches, to benefit from this worthy system and to diversify their risks.
Rahim, Hassan and Zakaria [16]	Model: Z-score. Period: 2005-2010 Frequency: 17 Islamic banks and 21 commercial banks in Malaysia	Studied the difference in the level of financial stability of Islamic banks as compared to commercial banks of Malaysia	They showed that Islamic banks are more stable than commercial banks.
Gamagita and Rokhin [23]	Model: Z-score. Period: 2004-2009 Frequency: 12 Islamic banks and 71 conventional banks in Indonesia	studied the stability comparison between Islamic and conventional banks in Indonesia	They show that the level of stability comparison between Islamic and conventional banks is significantly different. The results show that the Islamic banks have a lower degree of stability compared to the conventional counterparts. The researchers show that the small Islamic banks relatively have the same degree of stability with small conventional banks. Islamic and conventional banks tented to have the same relative degree of stability during the crisis period of 2008-2009.
Shahid and Abbas [24]	Model: Z-score. Period: 2005-2010 Frequency: 55 banks which 5 Islamic banks in Pakistan	Analyze the financial stability of Islamic banks and its comparison with conventional banks in Pakistan.	They found in Pakistan that the (i) small Islamic banks tend to be financially stronger than small conventional banks, (ii) large conventional banks tend to be financially stronger than large Islamic banks, (iii) small Islamic banks were financially more solid than large Islamic banks, which may reflect challenges of credit risk management in large Islamic banks; and (iv) the market share of Islamic banks had a significant impact on the financial strength of other banks.
Abdulkadhim Altaee, AnisTalo and Mohammad Adam [25]	Model: Z-score. Period: 2003-2010 Frequency:42 IBs and 55 CBs in Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates	studied the stability of Islamic and conventional banks in the gulf countries and They compared changes in certain aspect pre-and post-crisis	These researchers found that there was no significant difference between the financial stability of conventional and Islamic banking for the periods 2003-2010, 2003-2007, and 2008-2010. Conventional banks tend to be financially stronger than Islamic banks to pre-financial crisis.
Hasan and Dridi [26]	Model: Z-score. Period: 2005 to 2009 Frequency:85 Conventional banks and 37 Islamic banks in five GCC countries (Bahrain, Kuwait, Qatar, Bahrain, Saudi Arabia, and the UAE), three non-GCC countries, (Jordan, Turkey, and Malaysia)	compared the crisis effect on the Conventional and Islamic banks in eight countries	The researchers show that in the aspect of profitability, Islamic banks experienced a significant decline in profitability during the crisis period, although on average still relatively similar to conventionalbank profitability. In terms of assets and loans, Islamic banks showed much higher growth compared to the conventional banks in times of crisis and the assessment of external rating agencies indicates relatively stable ratings for Islamic banks.

Table 1: The studies that studied the financial stability of Islamic and conventional banks.

the conditional mean and volatility by using the GARCH, E-GARCH, and GJR-GARCH.

GARH (1,1): In 1986, the lag of the ARCH models became too large. Bollerslev [12] proposed adopting the generalized ARCH, known as the GARCH model (General Autoregressive Conditional Heteroskedasticity), which is an extension of the ARCH model developed by Engel [13]. The GARCH model is a representation of the autoregressive conditional variance process. The general form of this model by Bollerslev [2], which is called the GARCH (p,q) model, is given by:

$$h_t = \sigma_t^2 = \omega + \sum_{i=1}^{p} \alpha_i \xi_{t-i}^2 + \sum_{i=1}^{q} \beta_i h_{t-i} \quad (2)$$

(2)Where the GARCH parameters are restricted to $\omega > 0$, $\alpha_i > 0$ and

$\beta_i > 0$, q is the order of the autoregressive GARCH terms and p is the order of the moving average ARCH terms. Therefore, the GARCH (1, 1) model for one period can be summarized as follows:

$$h_t = \omega + \alpha\xi_{t-1}^2 + \beta h_{t-1} \quad (3)$$

Where, $\omega > 0; \alpha, \beta > 0$ and $\alpha + \beta < 0$

EGARCH (1,1): The exponential general autoregressive conditional heteroskedastic (E-GARCH) model proposed by Nelson is another form of the GARCH model. The E-GARCH model with the exponential nature of the conditional variance captures the effect of external unexpected shocks on the predicted volatility. This model allows for testing the asymmetries. When the residual is negative, volatility is impacted by two terms in the equation that includes the residual. The E-GARCH model also gives good results in the case of violent shocks. This model is formulated as:

$$\text{Log}(h_t) = \omega + \alpha\frac{\xi_{t-1}}{\sqrt{h_{t-1}}} + \gamma\frac{\xi_{t-1}}{\sqrt{h_{t-1}}} + \beta\log(h_{t-1}) \quad (4)$$

Where ω, α, θ and β are constant parameters

GJR-GARCH (1,1): Engel [13] tested the various asymmetric volatility forecasting models. They demonstrated that the one that most effectively models is the GJR-GARCH. The GJR-GARCH model was introduced independently by Glosten, Jagannathan, and Runkle [14]. The model has a positive and a negative shock on the conditional asymmetric variance. The formula for GJR-GARCH (1, 1) is as follows:

$$h_t = \omega + \beta h_{t-1} + \alpha\xi_{t-1}^2 + \gamma S^-_{t-1}\xi_{t-1}^2 \quad (5)$$

Where S-t-1= 1 if ξt-1<0, S-t-1= 0 if ξt-1≥0. ω, α, γ and β are constant parameters.

Model specifications

We use a specification test model to see which form of the equation of conditional volatility best fits the series. The three models used to capture the common characteristics of the financial asset return variance are; the standard symmetric GARCH model, the asymmetric GARCH (GJR-GARCH) model of Glosten et al. [14] and the exponential GARCH (EGARCH) of Nelson [15]:

$$h_t = \omega + \alpha\xi_{t-1}^2 + \beta h_{t-1} \text{ [GARCH]}$$

$$\log(h_t) = \omega + \alpha\frac{\xi_{t-1}}{\sqrt{h_{t-1}}} + \gamma\frac{\xi_{t-1}}{\sqrt{h_{t-1}}} + \beta\log(h_{t-1}) \text{ [EGARCH]}$$

$$h_t = \omega + \alpha\xi_{t-1}^2 + \gamma I[\xi_{t-1} < 0]\xi_{t-1}^2 + \beta h_{t-1} \text{ [GJR-GARCH]}$$

Where ξ_{t-1} is the innovation at time t-1, I is a dummy variable and I=1 if $\xi_{t-1}<0$, I=0 otherwise.

(γ) determines the effect of negative return shocks on the conditional variance and indicates that a negative shock has a greater impact on future volatility than a positive shock; therefore it has a greater influence on the conditional variance. To select the best model for each individual series, we use the log-likelihood function (log L) criterion.

Volatility effect of the financial crisis and the political uncertainty on the financial stability of IBs and CBs

To determine whether the financial and political crises have led to an increase or decrease in the volatility of stock prices in the three regions, we include a multiplicative dummy variable in the best equation of the conditional variance according to the procedure described above. In this paper, the best model is the GJR-GARCH conditional volatility equation:

$$h_t = (1 + \lambda_d Dt)\omega + \alpha\xi_{t-1}^2 + \gamma I[\xi_{t-1} < 0]\xi_{t-1}^2 + \beta h_{t-1} \quad (6)$$

Where D_t is an event dummy variable which takes a value of the unity after the financial crisis, and zero otherwise, and that of the unity after the Arab Spring, and zero otherwise. A significant estimate for parameter λ_d would indicate an increase in stock returns bank in the three regions during these crises[2].

Results and Discussions

Preliminary analysis

First, we applied the unit root test (augmented dickey fuller test). This test indicates that all the return series for both types of banks are not stationary during the three periods of the study.

We notice the volatility between conventional and Islamic banks suggesting a comparable stability. In addition, the stock returns of conventional and Islamic banks appeared to be volatile during the recent crises, reflecting the effect of the financial global crisis, the political uncertainty and further ARCH effects for most returns in the data over the last two crises. We also computed the descriptive statistics of the daily stock returns for Islamic and conventional banks for three regions (the Golf, the Mediterranean and the all MENA) before and, during the recent financial crisis and, Political uncertainty. These statistics are calculated and reported in Table 2. The Jarque-Bera normality test for conventional and Islamic banks during the three periods of the study strongly rejects the null hypothesis of normality distribution at 1% significance level. We also noted that conventional and Islamic banks in two regions, (the GCC and in all the MENA countries) during the Arab spring, have a positive Skewness, which indicates that the right tail of the distribution is longer. However, the other series have a negative Skewness, which means that the return distribution is highly skewed to the left. The kurtosis is higher than 3 for both types of banks during the financial crisis and political uncertainty, however, this is not for the Islamic banks in three regions before the crisis. This is said to be a leptokurtic distribution. All the Ljung-Box (LB) statistics for the returns of both types of banks for three regions during three periods are statistically significant, indicating that our return series are longer serially correlated.

Effects of the financial crisis and the Arab spring on the financial stability of IBs and CBs

In this paper, we attempt to examine the impact of the financial crisis and the recent political crisis in the Arab countries (i.e. Arab Spring) on the financial stability of the IBs and CBs in three regions.

We demonstrated the performance of a model using the specification test reported in Table 3 which indicates that (according to log L), the best model for IBs and CBs during the three periods of the study is the GJR-GARCH (1, 1), whereas the GARCH (1,1) was preferred for CBs for the MENA region before the financial crisis. To investigate the impact of the financial crisis and the Arab Spring on the financial volatility of IBs and CBs, as in equation 3, we first showed the results of returns for the conventional banks during the financial crisis. In all cases, the moving average parameters α are close to 0 and autoregressive parameters β tend to be close to 1. It can be seen that the coefficients describing the conditional variance are positive and significant at 1% and 5% in only the Mediterranean and MENA regions,

[2]This analytical framework is similar to that adopted by Chaua, Deesomsaka and Wang (2014) in the context of the political uncertainty and stock market volatility in MENA.

Region	GCC		Mediterranean		MENA	
Returns banks	**Islamic**	**conventional**	**Islamic**	**conventional**	**Islamic**	**conventional**
Panel A: Before financial crisis						
Mean	-0.0001	-0.0005	0.0007	-0.0001	-0.0001	0.0006
Std dev	0.0119	0.0102	0.0136	0.0122	0.0128	0.0083
Skew	-0.2446	-0.2744	-0.0799	-0.6412	-0.1192	-0.4068
Kurt	2.0909	5.8968	0.3692	3.5816	1.0658	4.9511
ADF	-10.6930	-12.0593	-11.6177	-11.6876	-16.7528	-8.5781
LB(12)	12.185**	9.143**	10.235**	11.257*	11.123**	13.257**
	(0.04)	(0.0 3)	(0.05)	(0.07)	(0.01)	(0.03)
ARCH(12)	28.6839***	5.8106	23.7631**	21.4520***	43.0583***	1.09
	(0.0043)	(0.9253)	(0.0219)	(0.0003)	(0.0000)	(0.2147)
JB	84.5328***	643.0123***	2.967	265.3317***	43.7381***	236.019***
	(0.0000)	(0.0000)	(0.2268)	(0.0000)	(0.0000)	(0.0000)
Nb obs	440	440	440	440	440	440
Panel B: during financial crisis						
Mean	-0.0002	-0.0005	0.0004	-0.0009	-0.0003	-0.0007
Std dev	0.0111	0.0101	0.0122	0.0115	0.0117	0.0108
Skew	-0.9929	-0.5635	-1.1120	-0.4289	-1.0664	-0.4928
Kurt	5.5631	4.4133	9.8987	3.1972	8.2384	3.7469
ADF	-20.1952	-14.5267	-19.6042	-14.6621	-20.1952	-14.5267
LB(12)	11.257**	11.235**	10.144*	9.125*	11.231*	14.236**
	(0.05)	(0.02) 183.6041***	(0.06)	(0.06)	(0.06)	(0.02)
ARCH(12)	44.1102***	(0.0000)	13.634	161.3929***	163.7716***	219.7809***
	(0.0003)	771.1105***	(0.3247)	(0.0000)	(0.0000)	(0.0000)
JB	1296.7791***	(0.0000)	3825.6146***	407.28***	5383.2207***	1115.7708***
	(0.0000)	892	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Nb obs	892		892	892	892	892
Panel C: during Arab Spring						
Mean	0.0011	0.0004	0.0006	-0.0003	0.0011	0.0003
Std dev	0.0146	0.0084	0.01	0.0213	0.0146	0.0203
Skew	0.2731	0.1599	-2.6864	-5.4108	0.2731	0.1584
Kurt	6.1116	4.5016	34.6778	80.9352	6.1116	4.8316
ADF	-14.6765	-21.2361	-19.8971	-21.2693	-28.2796	-28.34
LB(12)	13.254**	10.231**	12.101**	14.234**	10.231**	11.234**
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.016)
ARCH(12)	247.2954 ***	28.8279 ***	39.9004***	10.1544	5.883	104.2932 ***
	(0.0000)	(0.0041)	(0.0000)	(0.999)	(0.9219)	(0.0000)
JB	1217.3651***	659.345***	39867.2009***	585915.9172***	1217.3651***	1518.0232***
	(0.0000)	(0.0000)	(0.0)	(0.0000)	(0.0000)	(0.0000)
Nb obs	777	777	777	777	777	777

Notes: Std. Dev: indicates standard deviation, skewness measures the asymmetry series' distribution around the mean, kurtosis measures the flatness of series' distribution. For a normal distribution, the value of the skewness coefficient is zero and that of kurtosis is 3. LB (12) is the Ljung-Box test of serial correlation for the return, ARCH (12) is the Lagrange multiplier test for ARCH effect.
***Significant at 1%, **Significant at 5%, and *Significant at 10%.

Table 2: Summary statistics of stock returns of IBs and CBs.

Region	GCC		Mediterranean		MENA	
Returns banks	**Islamic**	**conventional**	**Islamic**	**conventional**	**Islamic**	**conventional**
Panel A: Before financial crisis						
Performance criteria: Log L						**900.7739**
GARCH	1342.207	1437.6204	1275.8940	1317.0312	2613.2188	890.0567
E-GARCH	1336.5615	1411.5742	1267.5582	1316.104	2598.1578	898.1571
GJR-GARCH	**1342.6558**	**2704.9334**	**1277.5662**	**2592.8879**	**2615.1203**	
Panel B: during financial crisis						
Performance criteria: Log L						5769.9447
GARCH	2863.8490	2963.2390	2807.3208	2811.2059	5664.2296	5667.757
E-GARCH	2858.4626	2910.7239	2727.7238 2	767.3739	5556.1455	5667.757
GJR-GARCH	**2871.2644**	**2966.513**	**2807.5635**	**2817.8938**	**5667.2758**	**5778.4380**
Panel C: during Arab Spring						
Performance criteria: Log L						
GARCH	898.8988	2629.8963	2499.9101	5227.8321	4652.6801	4001.3279
E-GARCH	889.4031	2613.5346	2499.8324	5226.0718	4652.8189	3980.121
GJR-GARCH	**900.7155**	**2630.6737**	**2505.6370**	**5607.0607**	**4655.1189**	**4002.9741**

Note: This table summarizes the results from an extensive GARCH model specification test. The standard GARCH model is compared with the asymmetric GJR-GARCH and the EGARCH:

Table 3: Results of specification tests for various GARCH models.

with the exception of γ in the Golf countries. Moreover γ is positive and significant, which indicates that the bank returns volatility is highly persistent and asymmetric. Concerning the coefficient estimates obtained for the dummy variable λ_d, the evidence suggests that the conditional variance for the Golf countries and the MENA region had significant changes in their volatility during the period of the financial crisis. This change, which was not present in the Mediterranean region, was induced by the subprime crisis. Similarly, the results of returns for Islamic banks with the exception of γ in the Mediterranean region indicate that the relevant coefficients in the variance equation

are significant. The parameter γ is positive and significant at 1%, 5% and 10% in only the GCC and MENA regions, which indicates that the bank returns volatility is highly persistent and asymmetric. The λ_d coefficient was found in the Islamic bank returns, which indicates that there was no change in that period. These results explain the confidence of investors in financial stability and economic growth in the Islamic banks of the region. These results are equivalent with prior evidence which suggests that financial crisis adversely affects conventional banks than Islamic banks Al Ali and Yousfi [6]; Boumediene and Caby [5]; Rahim et al. [16]. Secondly, concerning the effect of political uncertainty on the volatility of conventional bank returns; in all cases, with the exception of γ of the Golf countries, the coefficients in the variance equation are significant at 1%, 5% and 10%. Moreover, γ is negative and significant, which indicates that bad news has no impact on the volatility of conventional bank returns, which may be explained by the confidence of investors. The estimated coefficient obtained for the dummy variable λ_d is significant at 5% and 10%, except for the Mediterranean region. λ_d indicates that volatility for the Mediterranean region has not changed during that period. The evidence suggests that the conditional variance for the Golf countries and the MENA region had a significant change in their volatility during the period of the Arab spring. This change was induced in the recent revolution. Similarly, the results of Islamic bank returns except for γ of the MENA region indicate that the relevant coefficients in the variance equation are significant at 1% and 5%. Parameter γ is positive and significant, which indicates that the bank return volatility is highly persistent and asymmetric. In that period, the λd indicates that the volatility of Islamic bank returns in the Mediterranean region did not change but had a significant change in the Golf countries and the MENA region around that period. This change is explained by the recent revolution and political instability. These results are equivalent with prior evidence which suggests that political uncertainty adversely affects banks stability [17,18] and not conform to prior evidence which suggests that no difference effect of the political uncertainty and stability of Islamic banks [19].

Our findings for Islamic bank returns are more relevant than for conventional banks during the crisis period. This can be explained by the specificities of Islamic finance which prohibits speculation. In addition, during political uncertainty, Islamic banks saw their volatility-initially low- increase during the crisis whereas that of their conventional counterpart remained low during the crisis because of the panic. Therefore, the major MENA stock markets were affected, at the same time, by the Arab spring uprising and the instability in the stock markets in the MENA region [20]. These crises are not subject to the same risks and to the same regulations. Finally, these results confirm both the hypotheses that Islamic banks were at least partially immune to the financial crisis than conventional banks and Islamic banks were not subject to the same risks as conventional banks. However, due to their links with the real economy, they really suffered the consequences of the financial crisis and the political turmoil, which suggests that in general, the Islamic market provides further investment opportunities.

$$h_t = \omega + \alpha\xi_{t-1}^2 + \beta h_{t-1} \text{ [GARCH]}$$

$$\log(h_t) = \omega + \alpha\frac{\xi_{t-1}}{\sqrt{h_{t-1}}} + \gamma\frac{\xi_{t-1}}{\sqrt{h_{t-1}}} + \beta\log(h_{t-1}) \text{ [EGARCH]}$$

$$h_t = \omega + \alpha\xi_{t-1}^2 + \gamma I[\xi_{t-1} < 0]\xi_{t-1}^2 + \beta h_{t-1} \text{ [GJR-GARCH]}$$

The best-performing model is chosen on the basis of several information criteria, including the log-likelihood function (log L). The best model according to each criterion is highlighted in bold while the selected specifications used in our analysis are reported in the final column (Table 4).

Estimates of conditional variances

Before the crisis, volatility and risk in Islamic banks in the three regions were higher than conventional banks. This indicates the confidence of investors in the markets in general. During the financial crisis, the volatility of conventional banks increased whereas that of the Islamic banks decreased. This means mainly that conventional banks show a higher volatility than Islamic banks mainly in the Golf countries and the MENA region, but not for the Mediterranean region. The fact that the crisis has no impact on the volatility of Islamic banks indicates that investors have confidence in Islamic banks.

Similarly, during the Arab Spring, the volatility of conventional banks increased in both regions (the Mediterranean and the MENA), but did not increase in the GCC region whereas that of Islamic banks decreased for the GCC region and the Mediterranean region and increased for the entire MENA region. This explains that the investors' confidence in Islamic banks was not affected by this crisis. Therefore, this crisis had more impact on the conventional banks than on Islamic banks. The volatility of Islamic and conventional banks in the MENA region increased during the political crisis. This can be explained by the widespread of political protests, which seriously threatened the old order in the MENA region, and caused political uncertainty. Islamic and conventional banks' results show a positive skewness for both groups of banks for three regions during three periods. This indicates that the right tail of the distribution is longer. The kurtosis is higher than 3 for both types of banks in the three regions during three periods. However, this indicates that the distribution and fat tails are sharper than a normal distribution. They are leptokurtic. We conclude that Islamic banks were more stable than conventional banks during the financial crisis and the Arab Spring. However, investors had more confidence in this type of banks during periods of crises than before the financial crisis (Table 5).

Volatility of Islamic and conventional banksbefore, during the financial crisis and during the Arab spring

Okpara [21] indicated that the Wilcoxon signed-rank test is a non-parametric alternative to the two-sample t-test when the population cannot be assumed to be normally distributed. Wilcoxon rank-sum test is utilized to examine whether the difference in volatility between both groups of banks in three periods is statistically significant. The mean volatility of conventional banks in the three regions is significantly higher than that of Islamic banks at 1% level for the three periods [22]. These results corroborate the hypothesis that Islamic banks were at least partially immune to the financial crisis and the Arab spring. This indicates that bad news (the financial crisis and the Arab spring) has no impact on the financial stability of Islamic banks. Besides, the underlying hypothesis states that Islamic banks are not subjects to the same risks as conventional banks, due to their links with the real economy and their main principles as risk sharing (Table 6).

Conclusion

The recent financial crisis has induced a series of failures of many conventional banks followed by a political uncertainty, and led many economists to advocate the development of Islamic banks in the MENA region regarding stability during two crises. In light of the study objectives, we have examined the financial volatility of Islamic banks and that of their conventional peers in three major regions (the GCC, the Mediterranean, and the MENA) during periods of calmness, of

Region Returns	GCC		Mediterranean		MENA	
	Islamic	conventional	Islamic	conventional	Islamic	conventional
Panel A: during financial crisis						
Selected model	GJR-GARCH	GJR-GARCH	GJR-GARCH	GJR-GARCH	GJR-GARCH	GJR-GARCH
ω	0.0002***	0.0003***	0.0022*	0.0004***	0.0051***	0.0005***
	(4.8612)	(3.2266)	(1.8912)	(3.3689)	(3.3529)	(3.1991)
α	0.0997**	0.1397***	0.1275***	0.0998***	0.0921***	0.1022***
	(2.1339)	(6.1358)	(4.3739)	(5.2952)	(3.9887)	(4.5472)
β	0.5361***	0.8276***	0.8583***	0.8526***	0.8418***	0.8187***
	(7.6359)	(32.035)	(29.6877)	(39.6144)	(24.7179)	(24.4964)
γ	0.3022***	0.0411	0.0185	0.0561**	0.056**	0.0874***
	(3.6812)	(1.579)	(0.6611)	(2.3573)	(2.2391)	(2.6981)
λd	0.0413	0.0535**	0.0146	0.0440	0.0202	0.0722**
	(1.0417)	(1.9956)	(0.3902)	(1.5339)	(0.73003)	(2.5314)
Panel B: during Arab spring						
Selected model	GJR-GARCH	GJR-GARCH	GJR-GARCH	GJR-GARCH	GJR-GARCH	GJR-GARCH
ω	0.000005***	0.00001*	0.00005***	0.000002***	0.0000007***	0.00001***
	(3.4051)	(1.8089)	(8.3018)	(7.2343)	(3.5820)	(7.5998)
α	0.0434***	0.1396***	0.1859***	0.1318***	0.0285***	0.2659***
	(2.6326)	(2.8965)	(3.6238)	(10.5552)	(4.6594)	(9.2046)
β	0.8568***	0.6954***	0.2434***	0.938***	0.9628***	0.7679***
	(31.6477)	(5.196)	(3.2953)	(177.0566)	(251.9716)	(48.5829)
γ	0.1133***	-0.0490	0.264***	-0.1356***	0.0097	-0.0706**
	(3.7983)	(-0.9592)	(3.4163)	(-10.7582)	(1.0816)	(-2.0791)
λd	0.0579**	-0.0797*	0.0486	0.0101	0.056**	-0.0598**
	(2.1382)	(-1.8294)	(1.58774)	(0.57692)	(2.0253)	(-2.1381)

Note: This table reports the parameter estimates for each of the selected best-performing GARCH model with a multiplicative dummy; where Dt is a dummy variable takes on a value of unity after the start of Arab Spring and zero otherwise. A significant and positive estimate for λd would indicate an increase in MENA stock market volatility during the period of political uncertainty. The hetero scedasticity-consistent t-statistics are shown in parentheses.

*Statistical significance at the 10% level.

**Statistical significance at the 5% level.

***Statistical significance at the 1% level.

Table 4: Effects of the Financial Crisis and the Arab Spring on returns volatility for IBs and CBs in three regions.

Region Returns banks	GCC		Mediterranean		MENA	
	Islamic	conventional	Islamic	conventional	Islamic	conventional
Panel A: Before financial crisis						
Mean	0.000140	0.000097	0.000193	0.000150	0.000168	0.000059
Std dev	0.000048	0.000032	0.000060	0.000031	0.000058	0.000065
Skew	2.948579	4.557180	1.969955	5.325066	2.469855	7.458784
Kurt	11.839327	29.815458	6.179983	53.343534	8.969604	63.624394
Panel B: during financial crisis						
Mean	0.000115	0.000127	0.000116	0.000123	0.000137	0.000102
Std dev	0.000107	0.000145	0.000107	0.000035	0.000170	0.000032
Skew	5.932591	5.365517	5.941769	7.344585	5.369954	3.595792
Kurt	50.957795	45.113088	51.0664	119.102341	3.306710	19.3636448
Panel C: during Arab Spring						
Mean	0.000050	0.000083	0.000115	0.000470	0.000206	0.000340
Std dev	0.000025	0.000083	0.000107	0.000656	0.002194	0.000325
Skew	5.828766	10.864930	5.932591	23.962737	39.392011	3.801900
Kurt	51.393504	166.479973	50.95779	725.047224	1552.481731	26.879051

Notes: Std.Dev: Indicates standard deviation, skewness measures the asymmetry series' distribution around the mean, kurtosis measures the flatness of series' distribution. For a normal distribution, the value of the skewness coefficient is zero and that of kurtosis is 3.

Table 5: Statistical Estimates of Conditional Variances.

financial crisis and of political uncertainty. To this end, we considered a matched sample comprising returns of 11 IBs and 17 CBs using the GJR- GARCH model. Our analysis produced some interesting results which indicate that the global financial crisis has contributed to the volatility of conventional bank returns. Moreover, the volatility of Islamic banks increased during the recent political turmoil in these regions. Consequently, the results showed that there is a significant difference between IBs and CBs in terms of the effect of the financial crisis on the banking stability but little or no significant difference in terms of the effect of the Arab spring on the banking stability. Therefore, this does not mean that both crises are different from each other in terms of types of risks and that the impact of a political crisis on stock prices largely arises due to the psychological reactions. However, Islamic banks are more stable than conventional banks in general. This stability seems to be partially due to the different types of risks, the management methods and the governance of both types of banks. Overall; the results are consistent with our hypotheses. This in turn suggests that bank returns volatility is driven by financial and

	Before the crisis	financial crisis	Arab Spring
IB GCC	0.0002	0.0004	0.0003
CB GCC	0.001	0.0053	0.0067
Statistic*	14.354	21.231	11.231
P-value	0.000	0.000	0.000
IB Mediterranean	0.0006	0.0005	0.0003
CB Mediterranean	0.0037	0.0008	0.0074
Statistic*	5.470	7.253	13.254
P-value	0.001	0.000	0.000
IB MENA	0.0004	0.0004	0.0003
CB MENA	0.001	0.0023	0.0064
Statistic*	14.354	11.352	14.251
P-value	0.000	0.000	0.000

Notes: *Wilcoxon Two-Sample Test statistic. The null hypothesis is that the mean value of volatility is equal for both types of banks; the p-value is the probability that the null hypothesis is rejected at 1% significance level in favor of the alternative hypothesis that the stability is higher for Islamic banks.

Table 6: Mean Volatility of Islamic and Conventional Banks Before the crisis, During the Financial Crisis and During the Arab Spring.

economic factors, and to a lesser extent, by political events.

Overall, these findings complement the literature on the relationship between financial crisis and, political crises, and volatility of bank returns. Our results are very important in understanding the role of the financial crisis and that of the Arab spring on the financial stability of both types of banks. Therefore, they are of a great significance to international investors.

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