

# The Resilience of Islamic Banks in the Wake of Crises: Comparing Islamic and Conventional Banks in the MENA Region.

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## **Abstract**

This study aims to explore the historical and theoretical differences between Islamic and non-Islamic banking systems and test their performances in the wake of a crisis. This study focuses predominantly on Middle East and North African (MENA) Islamic and non-Islamic financial institutions' ability to recover from the Great Recession as well as explore how the different banking institutions performed when faced with the oil crisis in 2014. The objective of the study is to analyze the effectiveness and resilience of Islamic banks to withstand different financial shocks. The research showcases that Islamic banks are more buoyant in the wake of crisis and suffer lower decreases in profits as compared to conventional banks. The results indicate that Islamic banks showcase less risky operations and are able to weather and recover from crises more quickly than traditional banking institutions.

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\*I would like to thank Raymond J. Hawkins for all his help and guidance. His contributions materially improved this paper.

*To my parents for always supporting me*

*To my friends for pushing me to new heights*

*To my sister for never doubting me*

# 1 Islamic Finance

## 1.1 Introduction

Islamic banking can be thought of as invented tradition, a means to keep up with a challenging turn of the century ([Kuran, 2012](#)). Modern financial institutions started to evolve in the 17th century, notably in Britain, spurred by the development of mathematical techniques in finance and risk management ([Archer and Karim, 2007](#)). The issue was that these same developments did not take place in the Ottoman Empire, which comprised of the Middle East ([Archer and Karim, 2007](#)). Between the mid-18th century and the 20<sup>th</sup> the gap between the Middle Eastern and western living substantially widened ([Kuran, 2012](#)). Kuran argues that the region has preserved a series of institutional bottlenecks, rooted in the Islamic religious tradition that continue to affect its current development: (1) the Islamic law of inheritance, which inhibited capital accumulation; (2) the strict individualism of Islamic law and its lack of a concept of corporation or public sector: and (3) the waqf, Islam's distinct form of trust, which locked vast resources into organizations that were likely to become dysfunctional over time ([Kuran, 2012](#)).

Most empirical studies on the topic analyzed banks at a global level, including countries at different stages of their economic development. Our aim is to test the performance of Islamic and non-Islamic financial institutions in the Middle East and North Africa (MENA) region. We selected the MENA region due to its importance in both global financial markets through oil production and its importance in Islamic finance and Islam in particular. Our hypothesis is that Islamic banks are more resilient to crises than conventional banks and, as a result are able to recover faster in the post crisis period. We attempt this research project by testing the performance of Islamic and non-Islamic banks in the MENA region. We test their performance after the 2008 crisis and the oil price surge of 2014, which we refer to as the 2014 oil crisis.

Our study is broken up into five sections. Our introductory thoughts are followed by the background information on our research question. In section three, we discuss the data and methodol-

ogy that we used for our analysis in more detail. Section four presents the econometric results and interpretations of the regression outputs. Section five is the last section which covers the conclusion and suggests potential ideas for further investigation based on the results we have achieved in our study.

## 1.2 The Quran and Interest

The Quran justifies banning *riba*, or interest, as a way to promote a society based on fairness and justice ([Quran](#)). The key idea behind Islamic finance is that all income should be directly linked to work effort and that lending, as described in traditional economic literature, allows the lender to increase their capital without effort as money does not create a surplus value by itself ([Presley and Sessions, 1994](#)). Sessions further describes how the position on interest can be classified by reference to property rights ([Presley and Sessions, 1994](#)). Lending money is seen as no more than the transfer of this property right from one agent to the other, where if the borrower does not utilize the loan productively in way to generate additional wealth, then there is no claim to the additional property rights to either the borrower or lender ([Presley and Sessions, 1994](#)). However, if the borrowed money is used in a way that does generate additional wealth then both the lender as well as the borrower have a claim to a share of that additional wealth, but not in terms of a fixed return irrespective of the level of that additional wealth ([Presley and Sessions, 1994](#)).

The Quran justifies banning interest based on three different perspectives. From the borrower's perspective if the borrower makes a profit that is less than the interest payment than the business in question could result in making consistent losses and filing for bankruptcy and a loss of employment with the interest still being due back to the creditor. From a lender's perspective in a high-inflation environment the fixed rate of return may be below the rate of inflation, also, the transaction may be unfair to the lender if the net profit generated by the borrower is significantly higher than the return provided to the lender ([Schoon, 2016](#)). Finally, there is a wider economic argument as to why interest results in inefficient allocation of available resources in the economy

and may contribute to instability of the system (Schoon, 2016). In a traditional economic system capital is generally directed to the borrower with the highest creditworthiness (Schoon, 2016). However, in an economic system where profit and loss determine the allocation of capital, the potential profitability of the project is the dominant factor, which would lead to a more efficient capital allocation (Schoon, 2016).

### 1.3 Interest and Investment

The importance of interest cannot be overlooked in today's economic system. By reconstructing the mainstream inter-temporal model we are able to see how interest drives the investment and savings decisions of firms (Pelzman, 2012). Let's assume the basic firm uses capital and labor to produce goods and services. In the current period the, the firm produces output, according to the production function:

$$Y = zF(K, L), \quad (1)$$

where Y is current output and F represents a function of capital and labor used to produce goods and services, the production function. K is the current capital input and L is the current labor input. Having set up the current model we can extrapolate future period production:

$$Y_{t+n} = z_{t+n}F(K_{t+n}, L_{t+n}), \quad (2)$$

where  $(t + n)$  represents the future periods. In order to model the investment decision process we must first consider how something must be forgone in order to gain something in the future. The firm uses part of the current output in order to invest in capital. Using I to denote the quantity of current investment, the future capital stock is given by:

$$K_{t+n} = (1 - \delta)K + I, \quad (3)$$

where  $\delta$  is the depreciation rate. The goal of the firm is to maximize the present value of profits over the current and future periods. This will allow it to determine the firm's demand for current labor, as well as the current demand for the quantity of investment. For the firm, current and future profits, respectively, are given by:

$$\pi = Y - \omega L - l, \quad (4)$$

$$\pi_{t+n} = Y_{t+n} - \omega_{t+n} L_{t+n} + (1 - \delta) K_{t+n}, \quad (5)$$

We assume that  $\omega$  is the real wage rate and that  $l$  is representative of leisure time. We further assume that the firm pays out its profits ( $\pi$ ) to shareholders in the form of dividends in current and future periods. This assumption allows us to say that the firm maximizes the present value of the consumer's dividend income. If  $V$  is the present value of the profits for the firm then the firm maximizes:

$$V = \pi + \frac{\pi_{t+n}}{(1+r)}, \quad (6)$$

Equation (6) allows us to see that the benefits from investment come in terms of future profits and there are two components to the marginal benefit. First, an additional unit of current investment adds one unit to the future capital stock. This implies that the firm will produce more output in the future, and that the additional output produced is equal to the firm's future marginal product of capital, ( $MPK_{t+n}$ ). Second, each unit of current investment implies that there will be an additional  $(\delta-1)$  units of capital remaining at the end of the future period. We thus are left with:

$$\text{marginal benefits}(I) = \frac{MPK_{t+n} + 1 - \delta}{1+r}. \quad (7)$$

Which, in equilibrium, is equal to:

$$MPK_{t+n} - \delta = r. \quad (8)$$

The result of this model is the crux of what we find in most economic textbooks today:

efficient firms will invest until the net marginal product of capital is equal to the real interest rate, where the real interest rate is the rate of return on the alternative asset in the economy. The question, therefore remains, how can economic agents such as Islamic banks make efficient inter-temporal investment decisions without the use of an interest rate?

Pelzman makes the argument that without an interest rate,  $r$ , Islamic banks cannot operate as efficient firms. Since Islamic banks do not have any sort of interest rate they cannot be considered as efficient economic agents. However, ever since their inception, Islamic banks have been using LIBOR, an international interest-rate benchmark, as there was no other alternative benchmark based on socially ethical investing <sup>1</sup> ([Burne, 2011](#)). However, in 2011 as a result of the industry rapid growth and increasing importance Thomson Reuters created a reference rate called the Islamic Interbank Benchmark Rate, or IIBR ([Burne, 2011](#)). As explained by Thomson Reuters, the IIBR provides a reliable and objective indicator of the average expected return on Shariah compliant short term interbank market funding for the Islamic finance industry ([Reuters, 2011](#)). Rather than measuring interest on loans as LIBOR does, IIBR uses expected profits from short term money and a forecasted return on the assets of the bank receiving funds ([Burne, 2011](#)). Both components of the IIBR measure investment's rather than loans, therefore yielding the interest free  $r$  that we needed and allowing Islamic banks to be considered as *efficient* agents.

## 1.4 Partnership and Fixed Return Financing

Islamic finance provides multiple transaction types as a way to deliver a wide range of financial instruments ([Schoon, 2016](#)). The types of transaction can be split into two categories: profit and loss sharing and partnership methods and transactions with a more predictable or fixed return structure ([Schoon, 2016](#)). The partnerhsip method being the epitome of Islamic financial thought as it creates an environment where both parties share in the risk and reward of the project,

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<sup>1</sup> Banks use LIBOR to price loans between themselves, as the basis for consumer loans, and to calculate their cost of funding.

as previously mentioned. This relationship can be seen in greater detail in figure 1 where the three main transaction options are illustrated. Generally speaking, *Murabaha* has generally been seen as the primary financing option used by banks (37%) followed by *Mudaraba* (19%) and *Musharaka* (6%) ([Kahf, 1999](#)).

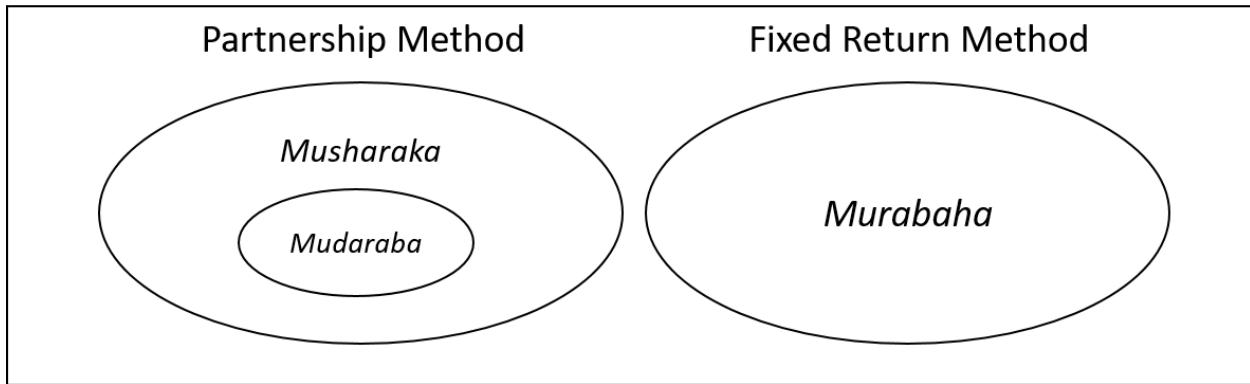


Figure 1: Types of Islamic Finance

*Musharaka* is Arabic for sharing and is used to describe a financial instrument where there is partnership, or joint-venture between the involved parties. What makes a *Musharaka* unique is that all parties provide both capital as well as skill and expertise to the joint-venture. In figure 2 we can see how the capital and expertise flow from both partners to the business enterprise and how as a result the business enterprise provides profit and loss to the partners. A *Musharaka* financing option mirrors the relationship between parties in a venture capital transaction as both parties essentially have equity in the business.

A *Mudaraba*, as seen in figure 3, is a partnership transaction in which only one of the partners contributes capital (the *rab al mal*), and the other (the *Mudarib*) provides skills and expertise ([Schoon, 2016](#)). A *Mudaraba* transaction is a subset of a *Musharaka* transaction as detailed in figure 1. Unlike a *Musharaka* transaction, however, the investor cannot interfere in the day to day operations of the business ([Schoon, 2016](#)). *Mudaraba* transactions are mainly used for private equity investments or for clients depositing money with a bank and often the underlying transaction type for the restricted and unrestricted accounts ([Schoon, 2016](#)).

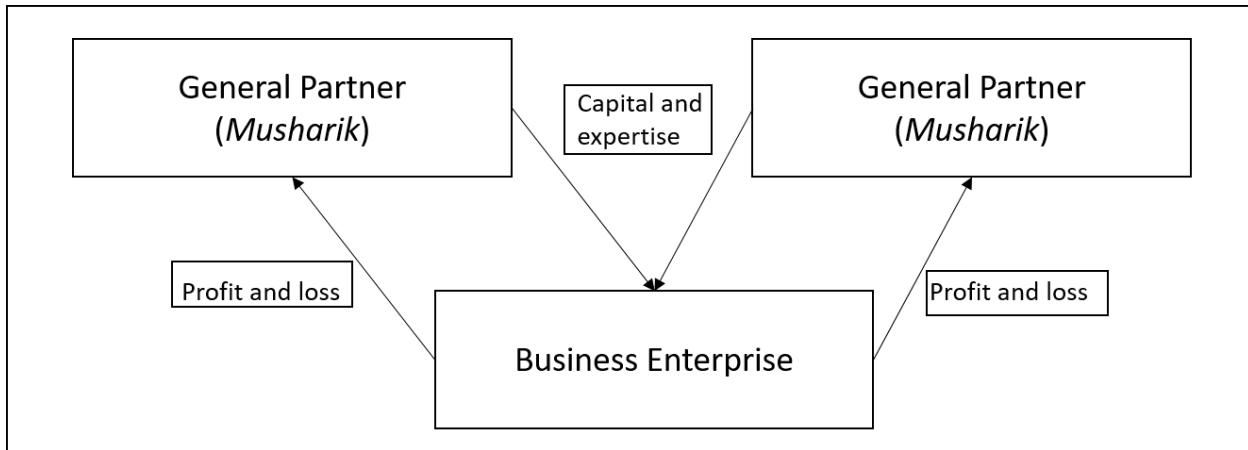


Figure 2: Flow of resources in *Musharaka* financing

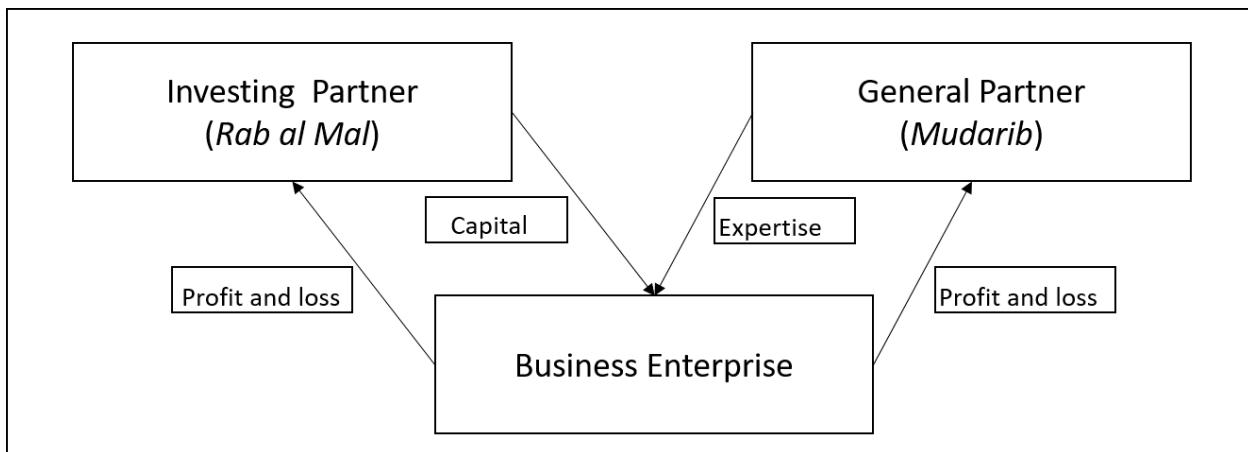


Figure 3: Flow of resources in *Mudaraba* financing

*Murabaha* is the form of Islamic finance that has historically been the most widely used due to its similarity to conventional banking (Kahf, 1999). *Murabaha*, or cost plus financing, has a risk-return profile that resembles low risk fixed income securities (Kahf, 1999). However, the bank does not charge interest but a fee based on the size of the loan (Warde, 2000). The way *murabaha* works is that the bank buys the item that the customer needs and sells it to the customer for a marked up price that the customer then pays back on a deferred basis or in instalments (Pelzman, 2012). The transactions are similar to lease transactions in the sense that the bank takes ownership of the item when it buys it from a third party and therefore assumes the risk, which entitles it to



Figure 4: Flow of resources in *Murabaha* financing

profit from the transaction (Pelzman, 2012). Figure 4 highlights the key components of *Murabaha* financing as the bank takes on the role of the seller and the business risk, which under the Shariah principles defined above justifies how it can demand a higher price than what it initially paid.

In addition to these three forms of financing, Islamic finance also imposes certain restrictions in terms of how these forms of financing can be applied. Certain conditions have to be met in order to warrant the use of Islamic financing, the rules of which are described in detail in Islamic jurisprudence, however, examples include the prohibition of financing debt, interest, gambling and alcohol related activities. Generally, Islamic finance can be seen as more risk averse as they will not enter into ventures they consider to be too risky due to the volatile nature of such types of investments. The lack of speculative investments further helps reinforce the risk averse nature of the enterprise.

## 1.5 Theoretical Underpinnings of Partnership and Fixed Return Financing

Based on the existing literature on the topic, we can construct a simple economic model to model underlying theory in Islamic financial models (Bashir, 2003). Beginning with the a representative firm and its output, we have:

$$y = \theta F(l_e, k), y \geq 0, \quad (9)$$

where  $y$  is the firms' output,  $l$  is the amount of entrepreneurial effort applied to these units of labor,  $k$  is the amount of capital needed to start the project. We further assume that  $F(.,.)$  is strictly increasing, concave in both labor and capital and twice continuously differentiable with  $F(0,k) = 0$ , for all  $k$ . The variable  $\theta$ , represents an exogenous demand or supply shock realized after the contract is signed but before production occurs. We also further assume that when the firm and the bank negotiate the terms of the contract, they agree on three things: the profit-sharing ratio retained by the firm,  $\lambda$ , the portion of total equity retained by the firm,  $\mu$  (with  $\mu k=w^2$ ), and  $x$ , the cost incurred by the manager when undertaking the project.

The Islamic forms of financing can be defined as  $(\lambda, \mu, x)$ . From this general form, we can extract the following:

- $\lambda \in (0,1)$ ,  $\mu = 0$ ,  $x \leq 0$ , is a profit sharing (PS), or *mudaraba*.
- $\lambda \in (0,1)$ ,  $\mu \in (0,1)$ ,  $x < 0$ , is profit/loss sharing (PLS) or *musharaka*.
- $\lambda \in (0,1)$ ,  $\mu = 0$ ,  $x > 0$ , is a mark-up (MU) or *murabaha*.

The above equation allow us to clearly see the relationship between the three financing options. *Musharaka* financing clearly resembles venture capital as the bank ends up with equity in the venture they fund. Moreover, we can see that the main difference between *Mudaraba* and *Murabaha* financing is  $x$ , the cost incurred by the manager when undertaking the project. As explained in the previous section, *Mudaraba* financing involves two parties, one with entrepreneurial expertise and the other with the capital. Allowing the cost of the project to the entrepreneur to be less than or equal to 0 reflects how only one party bears all the financial burden of the enterprise.

## 1.6 Theoretical Framework of Islamic Finance

Legal scholars generally establish that the partnership forms of financing are considered more Islamic than the mark-up transaction form, the latter containing interest like attributes. The

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<sup>2</sup>Where  $w$  represents the starting wealth of the entrepreneur

prohibition of (riba) interest, is perhaps the most far reaching and controversial aspect of Islamic economics ([Presley and Sessions, 1994](#)). The elimination of interest payments would involve the rewriting of capitalist economics and would yield major changes in the functioning of both the national and international economic financial systems ([Presley and Sessions, 1994](#)).

Islamic finance, especially *Musharaka* and *Mudaraba* financing see its theoretical roots through the eyes of contract theory. Specifically, contract theory was used to model Islamic finance contracts under profit and loss sharing agreements (PLS) ([Bashir, 2003](#)). The creditor/debtor relationship breaks down in Islam as the lender becomes as partner in the business or project, sharing in the provision of enterprise and, as a result, not distanced from the use to which money is put ([Presley and Sessions, 1994](#)). Generally speaking, the partnership type of Islamic finance is considered to be the more acceptable financing form in Islamic legal tradition. Moreover, in their 1994 article "Islamic Economics: The Emergence of a New Paradigm", Sessions and Presley, are able to show that the use of mudarabah (partnership) financing will, under certain conditions, lead to an enhanced level of capital investment on account of the ability of the mudarabah to act as an efficient revelation device ([Presley and Sessions, 1994](#)).

Profit and loss sharing could in certain conditions yield an enhanced level of capital investment, however, in our particular case we do not need to justify the the superiority of the theoretical aspect of profit and loss sharing over a traditional banking model. We are interested in comparing the performance of Islamic and conventional banks, which means that our results' validity depends on the composition of these banks' balance sheets. Historically speaking, *Murabaha* has been the most common financing option used by banks ([Kahf, 1999](#)). Knowing that *Murabaha* is the most common financing option helps our case as it makes commercial and Islamic banks more comparable in terms of lending. It seems that the means used by both banks are the same, however, the medium under which they are deployed varies.

## 2 MENA, the GFC, and the Oil Crisis

### 2.1 Middle East and North Africa (MENA)



Figure 5: Map of MENA

Our study focuses on financial institutions in MENA countries. The map, in figure 5, showcases the geographic breakup of the region. The region accounts for an estimated 6% of the World population and an estimated 60% of the world's oil reserves and 45% of global gas reserves ([WB, 2017](#)). Twelve of the fifteen OPEC members are in the MENA region. The region has grown in importance ever since the Arab Spring began in 2011 and the World Bank reports that the region's overall economic growth is still sluggish as it battles rising youth unemployment, increasing debt levels, and a reliance on hydrocarbons. In this study data limitations restrict us to Gulf Co-operation Council (GCC) and North-African countries. We discuss this issue further in the Data section. MENA countries represent a wide variety of economic characteristics. Certain economies account for over 70% of global oil production (GCC), whilst others are oil importers (Egypt) ([IMF, 2019](#)). Changes in oil prices undoubtedly have global implications, however, they are particularly felt at the source. Oil revenue represents on average over 50% of GDP in many of these countries ([WB, 2017](#)). Moreover, countries that are net importers are still negatively affected due to the

importance of remittances to the local economy. Research estimates that remittances accounted for \$20 billion in 2014 and are closely tied to oil prices, given the importance of Egyptian workers in the GCC ([MEA, 2007](#)). The economic and political disparities of these groups are intertwined through their reliance one another and especially the state of the oil markets.

## 2.2 Oil Crisis

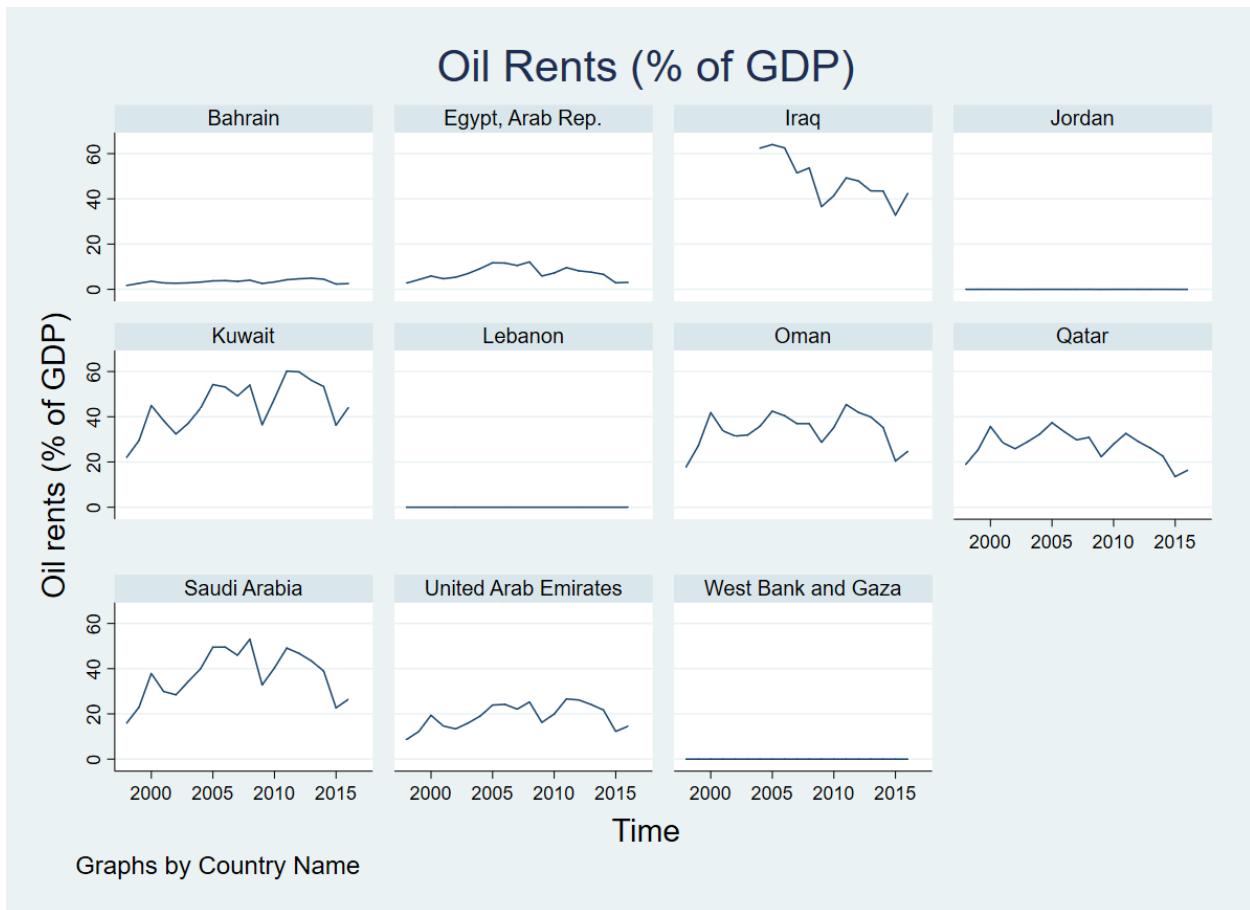


Figure 6: Oil rents as a percentage of GDP for MENA countries

The importance of the 2014-2015 oil crisis for these economies can be seen in the graph below, in figure 6. We were able to obtain data from the World Bank in order to plot changes in oil rents as a percentage of GDP over time. For many of these countries oil generated as much as

20% of GDP in the years leading up to the crisis. The above data can be used to infer that the oil crisis had major repercussions on the countries in our sample. As a result, we believe that testing the performance of the financial institutions over this time period warrants a closer analysis.

### 2.3 Global Financial Crisis (GFC)

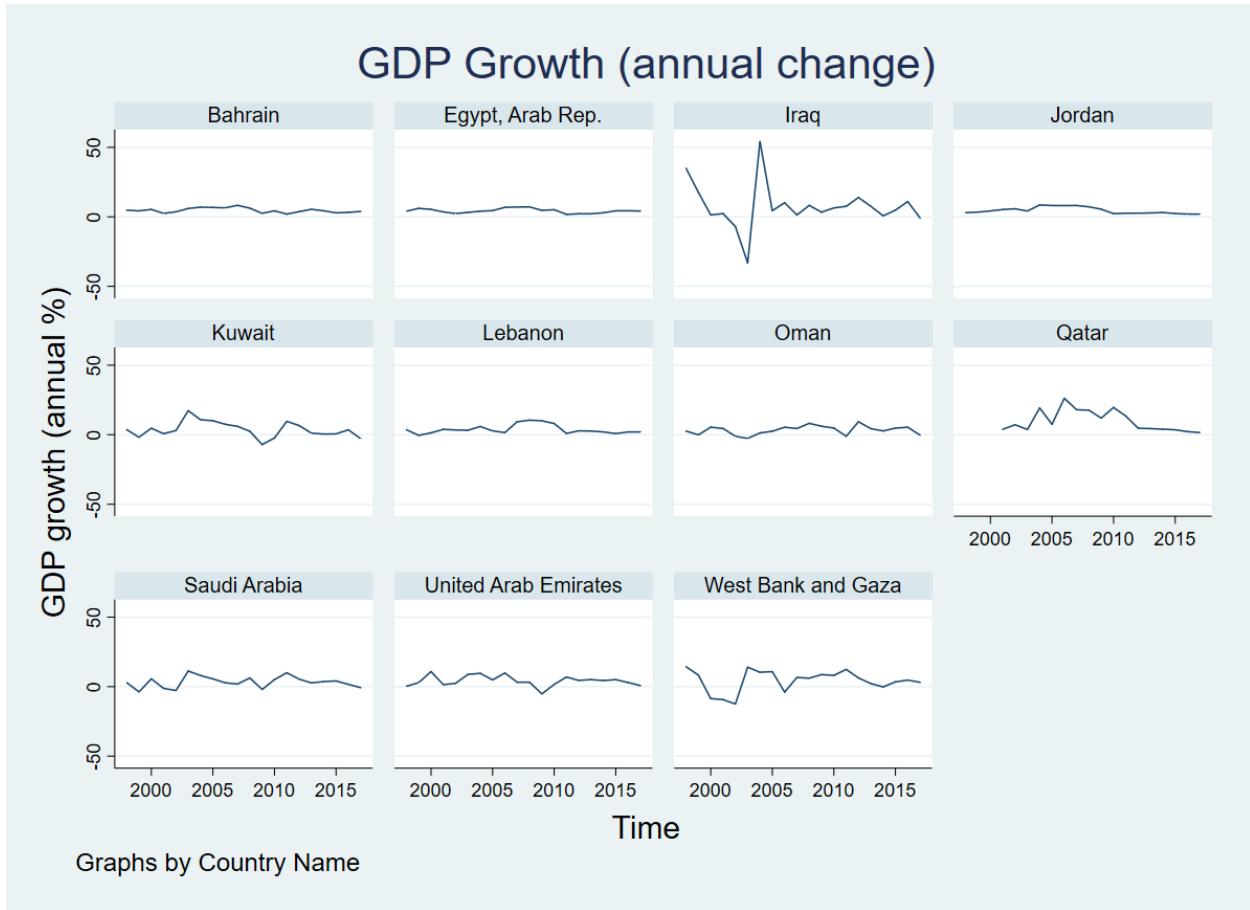


Figure 7: Changes in GDP growth for MENA countries

The Great Recession, epitomized by the collapse of banking giant Lehman Brothers, spanned from 2007 to 2012 ([Akhtar and Jahromi, 2017](#)). The crux of the crisis can be attributed to aggressive and risky lending practices. The crisis began in the United States and rapidly spread across the rest of the world. The international financial system was and can still be described as

heavily intertwined. The evidence in the literature suggests that the failure of the banking system in the United States resulted in further contractions to the domestic economy as well as a contagion effect to the rest of the World. Figure 7 showcases how the GFC affected the GDP growth rates of the countries in the sample. We can see that for many countries GDP dipped at the onset of the crisis. We are interested in testing the performance of banks after the crisis. The crisis and its repercussions did extend to the Middle East as we can see a drop in GDP growth during the 2008 period. Our research aims to understand what went wrong and what could be done differently to avoid the extent of the repercussions seen in 2008. We use Islamic Banking as an alternative model in order to test how different shocks affected both types of financial institutions. We test our hypothesis that Islamic banks are more resilient than conventional banks through difference and difference analysis where we were able to identify an association between resiliency and the different financial shocks.

### 3 Model, Methods and Data

The aim of our research is to understand the effect of the GFC and the oil shock on the profitability of Islamic and conventional banks in the MENA region in order to supplement the theoretical underpinnings we previously put forward. Our hypothesis remains in line with the results obtained in the literature that Islamic banks are less affected on average than their conventional counterparts due to the risk tolerance of their operations. In order to test our hypothesis difference in difference tests are employed where the various shocks as our treatments are used. We were able to obtain data for banks in the MENA region dating from 12/31/2007 to 12/31/2018. We obtained all our data from Capital IQ and used all the data available on the database for both Islamic and non-Islamic banks in the MENA region.

Our analysis was restricted to commercial banks to provide vanilla banking operations such as consumer loans, mortgages and deposits. Investment banks or other forms of financial insti-

tutions were not included as they provide services on top of those provided by traditional Islamic banks. Moreover, data on Syria was collected, but Syria was not included in the final database since the Syrian banks highlighted in the sample were not independent financial institutions, but branches of UAE banks. This issue was only taken into account after issues of multicollinearity were reported between Syria and the UAE. Based on the available data for the following countries was collected, which we describe as being representative of the MENA region: Bahrain, Egypt, Iraq, Jordan, KSA, Kuwait, Lebanon, Oman, Palestinian Authority, Qatar, and UAE. Unfortunately, data on the other MENA countries was not collected: Algeria, Djibouti, Iran, Libya, Malta, Morocco, Tunisia and Yemen. We don't believe that excluding these countries will heavily bias the data since data on the major oil producers was not collected. Algeria and Iran could have been interesting and beneficial additions, however, no data was available. Moreover, the additions of Iran and Yemen into the sample could have biased the results for the most recent years due to the economic sanctions and the civil war. We feel that we would have ended up removing these countries from the sample regardless due to the aforementioned circumstances. Moreover, the other excluded countries are either considered relatively small economies or do not contribute to the oil production and would not dramatically bias our results.

To test our hypothesis two main regressions were performed. The first regression aims to test the performance, in terms of Net Income, of Islamic banks and non-Islamic banks during the post 2008 crisis period. Based on the literature the recession is defined as lasting between 2008 and 2012. We therefore set all the data after the 2012 calendar year as 1 and the rest as 0; we call this crisis dummy: post08. Our second regression involves the oil crisis that occurred in 2014, we therefore set all the data after the 2014 calendar year equal to 1 and the rest equal to 0, we call this dummy variable post2014. We also use the Islamic dummy variable to identify all Islamic banks in the sample. Country variables are also introduced and are set to 1 if any given bank is in that

particular country.

$$y_i = \beta_0 + \beta_1 Islamic + \beta_2 Post08 + \beta_3 (Post08xIslamic) + \beta_4 TotalAssets + \varepsilon_i \quad (10)$$

$$y_i = \beta_0 + \beta_1 Islamic + \beta_2 Post08 + \beta_3 (Post08xIslamic) + \beta_4 TotalAssets + \varepsilon_i \quad (11)$$

$$y_i = \beta_0 + \beta_1 Islamic + \beta_2 Post08 + \beta_3 (Post08xIslamic) + \beta_4 TotalAssets + \beta (Islamic \times Country_i) + \varepsilon_i \quad (12)$$

The above regressions will allow us to test the impact of the post 08 period on the profitability of Islamic and conventional banks. In all three regressions we control for Total Assets since the sizes of Islamic and non-Islamic banks are significantly different not controlling for bank size would induce OVB. Regression (11) is an extension of regression (10) and includes country fixed effects in order to account for any differences that vary across countries but do not vary over time such as the attitudes towards financial services. The different interaction terms between the country and Islamic dummy variables allow us to better understand how Islamic banks were affected in each country. This piece of information is particularly useful when dealing with establishing bank branches as the results would point towards where Islamic banks perform best.

$$y_i = \beta_0 + \beta_1 Islamic + \beta_2 Post14 + \beta_3 (Post14xIslamic) + \beta_4 TotalAssets + \varepsilon_i \quad (13)$$

$$y_i = \beta_0 + \beta_1 Islamic + \beta_2 Post14 + \beta_3 (Post14xIslamic) + \beta_4 TotalAssets + \varepsilon_i \quad (14)$$

$$y_i = \beta_0 + \beta_1 Islamic + \beta_2 Post14 + \beta_3 (Post14xIslamic) + \beta_4 TotalAssets + \beta (Islamic \times Country_i) + \varepsilon_i \quad (15)$$

The second part of my regression focuses on the effects on the 2014 oil crisis on the profitability of Islamic and non-Islamic banks. Using the same dataset as above we allocated binary variables to all the data post year end 2014 and used an interaction term between Islamic and the post2014 dummy variable. The regressions run in this part of the analysis are the same as above,

the only difference being the time range on which they are run. Once again, the difference between (13) and (14) being in terms of country fixed effects.

## 4 Results and Discussion

### 4.1 Global Financial Crisis (GFC)

VARIABLES	(1) Net Income	(2) Net Income	(3) Net Income
Islamic	-20.32 (13.71)	-34.99** (14.48)	-68.96 (58.25)
Post08	-46.59*** (15.67)	-52.56*** (15.39)	-53.28*** (15.50)
int08	44.82** (18.30)	51.76*** (18.77)	54.08*** (17.86)
Constant	0.303 (11.41)	4.952 (25.47)	5.742 (25.64)
Observations	951	951	951
ctrl TA	Yes	Yes	Yes
ctrl Country Fixed Effects	No	Yes	Yes
<i>Country*Islamic</i>	No	No	Yes
R-squared	0.872	0.878	0.880

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure 8: The performance of Islamic and conventional banks post GFC

The results from regression (1), in figure 8, show that net income is on average \$44.82 million higher for Islamic banks than for conventional banks in the MENA region for the post GFC period. The results are statistically significant at the 5% level. The results from regression (2) show that net income is on average \$51.76 million higher for Islamic banks than for conventional banks in the MENA region during the period from 2013 to 2018, which encompasses the economic recovery as well as more recent performance statistics. The results are highly statistically significant at the 1% level. The results from regression (3) show that on average that net income was

\$54.08 million higher for Islamic banks than for their conventional counterparts during the post GFC period. The results are statistically significant at the 1% level.

We can also infer from regression (1), (2), and (3) the overall effect of being an Islamic bank post crisis. We can see that the overall effect on being an Islamic bank during the post crisis period is positive for regressions (1) and (2) but not for regression (3), the addition being the *CountryxIslamic* term. Moreover, the effect of non-Islamic banks post crisis showcased by these regressions is negative, which means that the non-Islamic banks were loss making during the post GFC crisis. It is worth noting that this inference is only valid for regression (2), where country fixed effects were added. From the data above, we can see the non-Islamic banks continued making losses on the post crisis periods, whereas, Islamic banks slightly profitable except in regression (3). These results are in line with our hypothesis and make economic sense since we can see that Islamic banks were more resilient to the crises than conventional banks. The results we obtained also support the previous carried out by researchers.

It's important to note that for all three of these regressions we control for the bank's total assets since conventional banks are larger than Islamic banks; not controlling for asset size would induce further omitted variable bias (OVB). The dataset contains 9 different MENA countries, and it would be unrealistic to assume that the attitudes towards financial services are the same in all the countries. By not accounting for country fixed effects we are essentially limiting the scope of our analysis since we are inducing OVB.

## 4.2 Oil Crisis

The results from regression (4) show that net income is on average \$49.71 million higher for Islamic banks than for conventional banks in the MENA region. The results are statistically significant at the 5% level. The results from regression (5) show that net income is on average \$57.90 million higher for Islamic banks than for conventional banks in the MENA region during the period from post oil crisis period. The results are highly statistically significant at the

VARIABLES	(4) Net Income	(5) Net Income	(6) Net Income
Islamic	-14.45 (10.87)	-28.55** (11.68)	-64.24 (57.89)
Post14	-49.15*** (15.84)	-54.35*** (15.73)	-54.94*** (15.86)
int14	49.71*** (18.41)	57.90*** (19.55)	54.15*** (18.70)
Constant	-6.649 (9.613)	-9.413 (28.94)	-8.872 (29.18)
Observations	951	951	951
ctrl TA	Yes	Yes	Yes
ctrl Country Fixed Effects	No	Yes	Yes
<i>Country*Islamic</i>	No	No	Yes
R-squared	0.872	0.878	0.880

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure 9: The performance of Islamic and conventional banks post oil crisis

1% level. The results from regression (6) show that on average that net income was \$54.15 million higher for Islamic banks than for their conventional counterparts during the MENA oil crisis. The results are statistically significant at the 1% level.

We can also infer from regression (4), (5), and (6) the overall effect of being an Islamic bank post oil crisis. We can see that the overall effect on being an Islamic bank during the post crisis period is positive for regressions (4) and (5), but not for regression (6), which is similar to what we obtained in the regressions (1), (2), and (3). Moreover, the effect of non-Islamic banks post crisis showcased by these regressions is negative, which means that non-Islamic banks were loss making during the post crisis period. From the data above, we can see the non-Islamic banks continued making losses on the post crisis periods, whereas, Islamic banks were profit making, except in the case of regression (6), where even Islamic banks were loss making. These results are in line with our hypothesis and make economic sense since we can see that Islamic banks were more resilient to oil crisis than conventional banks.

### 4.3 Further Analysis

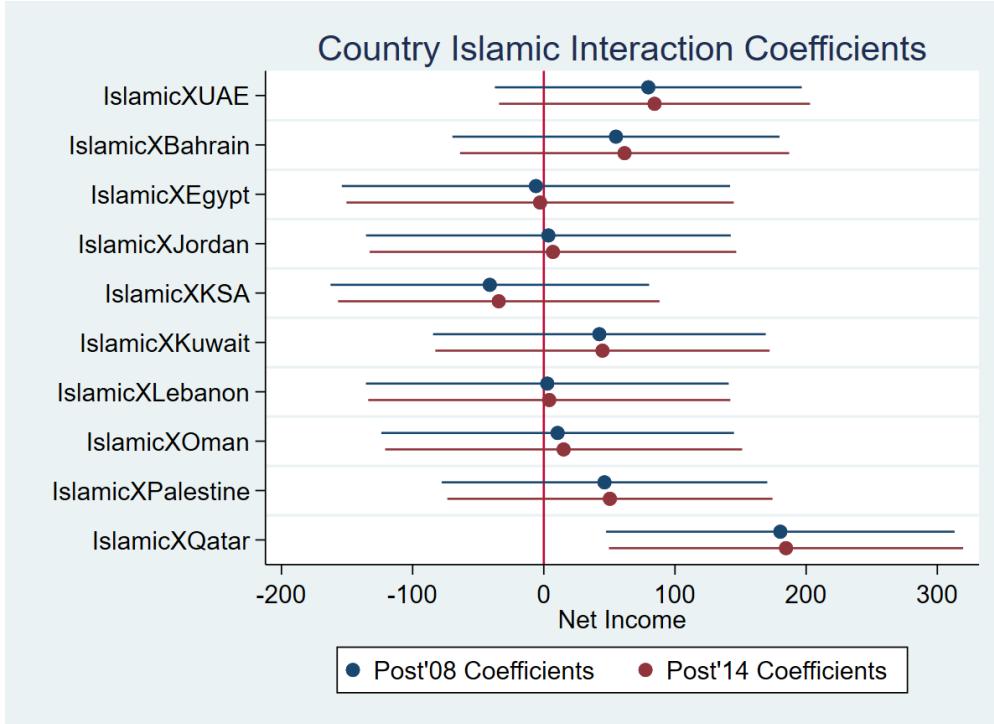


Figure 10: Effects of being an Islamic bank in MENA countries

Figure 10 highlights how Islamic banks were impacted during both crises in each of the countries in our sample. The data represents the added marginal increase in net income when an Islamic bank finds itself in one of these countries in comparison to Iraq, which was omitted due to multicollinearity issues. There are a couple of countries which stand out in terms of logical economic reasoning. Most notably, Saudi Arabia showcases negative additional net income as compared to Iraq. This is somewhat since we would have expected Saudi Arabia as the largest economy in the sample to showcase positive results<sup>3</sup>. The negative results suggest that the effect of a bank being in Saudi Arabia is detrimental to their profitability. However, the moment is not statistically significant which means that we cannot infer that there is a relationship between a decrease in profitability and being present in Saudi Arabia. On the other hand, Qatar showcases

<sup>3</sup>The detailed regression tables can be found in the appendix under figure 14.

highly statistically significant and positive results, which make economic sense since the small Gulf country has showcased strong economic performance in recent years. However, we believe the current impact of operating an Islamic banks in Qatar may actually be negative since Saudi Arabia imposed an embargo in 2017, which impacted the country's ability to deal with other Middle-Eastern players. In terms of banking operations this would limit the ability of banks based in Qatar to deal with clients in the UAE, KSA, and Egypt, some of the largest MENA based economies.

#### 4.4 Robustness Check

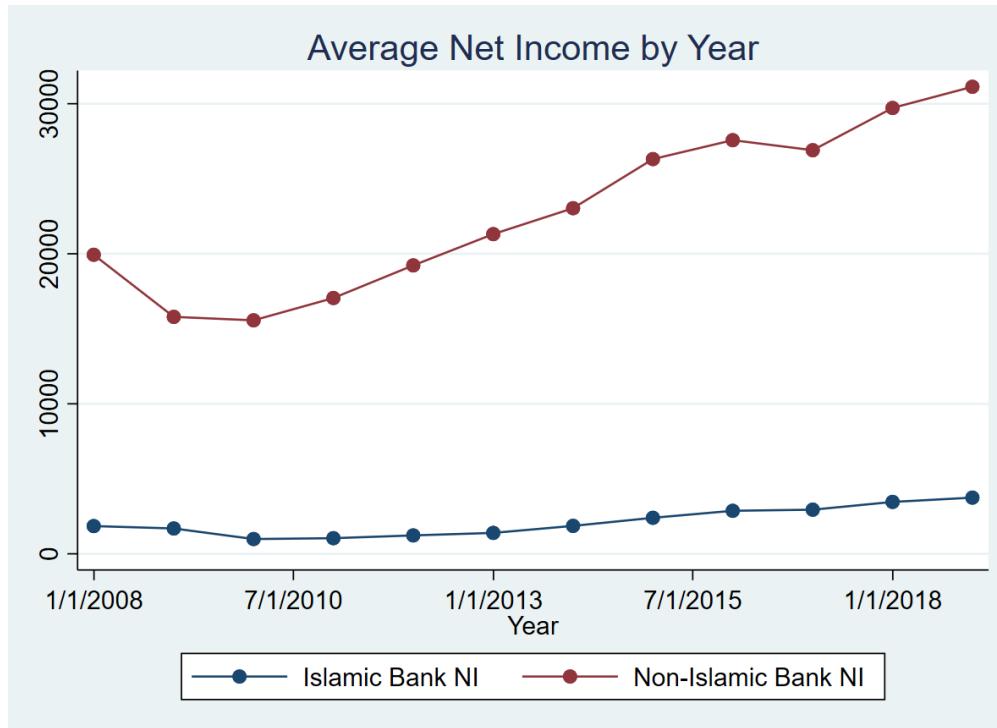


Figure 11: Parallel Trends

Figure 11 shows that parallel trends were not held during the pre-treatment period for both the GFC and the oil crisis. It seems that the lack of parallel trends points towards difference in difference not being the best model for our data. However, our inference can still be deemed valid as long as we can showcase similar trends using OLS regression. We are then able to use the

same dataset to perform similar regressions to those performed using the difference in difference method. Instead of using post-crisis dummy variables we can perform the OLS regressions for certain time ranges that encompass our shocks.

VARIABLES	Range [2012 - 2018]	(1) Net Income	(2) Net Income	(3) Net Income
Islamic		22.88** (9.234)	14.34 (10.06)	-26.93 (37.28)
TA		0.0182*** (0.000562)	0.0182*** (0.000545)	0.0182*** (0.000545)
Constant		-43.74*** (9.980)	-47.80** (23.28)	-47.71** (23.48)
Observations		489	489	489
ctrl Total Assets		Yes	Yes	Yes
ctrl Country Fixed Effects		No	Yes	Yes
<i>Country*Islamic</i>		No	No	Yes
R-squared		0.919	0.926	0.928

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure 12: GFC OLS regressions

The regressions in Figure 12 will be used as robustness checks in order to justify the inferences made using the diff-in-diff method. The variable of interest in these regressions is the Islamic dummy variable, which allows us to understand how the effect of a bank being Islamic on net income, while controlling for other variables as well as performing the experiments over different time frames. These OLS regressions are performed similarly to what was done with the difference in difference method. The data from regression (1) suggests that Islamic banks during the post 2008 crisis had on average \$22.88 million more in net income than their conventional counterparts. The statistic is statistically significant and makes economic sense as it justifies our intuition from our previous analysis. We can also see that as we control for the different country fixed effects the net impact of being Islamic remains positive, however, the moment is no longer statistically significant. However, what was surprising was that once we controlled for country

fixed effects and included the *CountryxIslamic* indicators the coefficient on Islamic turned negative. Fortunately, the statistic is not statistically significant as it would not have made economic sense.

VARIABLES	(4) Net Income	(5) Net Income	(6) Net Income
Islamic	31.70*** (11.65)	29.24** (12.77)	-152.9 (104.4)
TA	0.0181*** (0.000625)	0.0181*** (0.000607)	0.0181*** (0.000604)
Constant	-50.01*** (11.76)	-14.54*** (2.404)	-14.49*** (2.417)
Observations	325	325	325
ctrl Total Assets	Yes	Yes	Yes
ctrl Country Fixed Effects	No	Yes	Yes
<i>Country*Islamic</i>	No	No	Yes
R-squared	0.929	0.934	0.936

Robust standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure 13: Oil crisis OLS regressions

The regressions in Figure 13 analyze the impact of the post crisis period on the performance of banks in the sample. Regressions (4), (5), and (6) are run in the same exact manner as regressions (1), (2), and (3), the only difference being the time frame analyzed. Regressions (4) and (5) suggest that during the post-14 crisis period Islamic banks were more profitable by around \$30 million when both controlling and not controlling for entity fixed effects. The results in regression (6) mirror those of regression (3) in the sense that the coefficient on Islamic is negative. However, once again the statistic is not statistically significant. The OLS regressions also enabled to better understand how Islamic banks performed in certain countries relative to others. The *IslamicxCountry* interaction terms in the OLS regressions have results in line with those obtained through the difference in difference method. The results still hold that Saudi Arabia performed poorly after the effects of the crises, which was surprising considering it is one of the

largest economies in the region.

## 5 Conclusion

Our analysis yielded results in line with our hypothesis as we were able to show that there exists a link between our shocks and the impact on the profitability of Islamic banks. However, the failure of the robustness assumption inhibits us from demonstrating any causal relationship. Our OLS regressions, however, enabled us to showcase the existence of a relationship between the various shocks and the performance of Islamic banks. The results we obtained were in line with our initial hypothesis and were in line with the literature. We were able to showcase that Islamic banks appear to be more resilient in the wake of crisis as compared to conventional banks in the MENA region. We were able to obtain statistically significant results that suggest that both the GFC recovery and the oil crisis affected Islamic banks less than their conventional counterparts. The results we obtained were in line with what we were expecting. We believe that our results are both internally and externally valid since the results we obtained were in line with our expectations and the literature.

Some of the moments we identified showcased the difference in performance in the MENA region as compared with the rest of the World. Indeed, the years post 2008 have been tumultuous for many MENA countries, specifically the North African ones. Our sample contained mostly GCC countries, which attenuated the effects of the Arab Spring in 2012. Moreover, it was interesting to see how Islamic banks appeared to have performed worse than their conventional counterparts during the timeline that initial stages of the 2008 crisis, especially considering that Islamic banks do not trade debt securities. Further research noted that within the Middle East there were additional shocks which worsened the performance of Islamic banks. Furthermore, the data also suggested that the current Qatar blockade negatively affected the conventional banks more than the Islamic banks.

We believe that this topic can still be broadened in depth as political and economic changes have accumulated over the recent years. Potentially investigating how the Arab Spring (2011) affected Islamic banks could be an interesting avenue to take, data permitting of course. Moreover, further investigating how the Qatar blockade affected the performance of the different types of banks at a more microeconomic level could also be an interesting avenue. Finally, adapting a more international approach and comparing how Islamic banks performed in different regions could also be an interesting topic. MENA may be one of the main hubs for Islamic finance, however, certain Muslims majority South East Asian countries are quickly embracing its principles.

## 6 Appendix

VARIABLES	Post08	Post2014
	Net Income	Net Income
<i>IslamicXUAE</i>	79.67 (59.63)	84.43 (60.42)
<i>IslamicXBahrain</i>	55.03 (63.53)	61.57 (63.93)
<i>IslamicXEgypt</i>	-5.989 (75.42)	-2.819 (75.23)
<i>o.IslamicXIraq</i>	-	-
<i>IslamicXJordan</i>	3.517 (70.85)	6.972 (71.20)
<i>IslamicXKSA</i>	-41.17 (61.89)	-34.33 (62.44)
<i>IslamicXKuwait</i>	42.37 (64.63)	44.73 (64.94)
<i>IslamicXLebanon</i>	2.658 (70.47)	4.160 (70.34)
<i>IslamicXOman</i>	10.53 (68.50)	15.12 (69.34)
<i>IslamicXPalestine</i>	46.27 (63.25)	50.37 (63.16)
<i>IslamicXQatar</i>	180.3*** (67.70)	184.7*** (68.80)
Constant	5.742 (25.64)	-8.872 (29.18)
Observations	951	951
ctrl TA	Yes	Yes
ctrl Country Fixed Effects	Yes	Yes
<i>Country*Islamic</i>	Yes	Yes
R-squared	0.880	0.880

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure 14: Detailed results for *IslamicxCountry* interaction terms for difference in difference tests.

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