Comparative Efficiency Study between Islamic and Traditional Banks

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Abstract Islamic banking caught attention due to its resilience to the significant shocks that hit the economy in late 2008. This research aims to evaluate the efficiency of a sample of 66 banks including both Islamic and traditional banks in various countries ranging from Egypt, Pakistan, Bangladesh, Saudi Arabia, Kuwait, Qatar, Iraq, Emirates, Sudan, Turkey, Bahrain and Jordan throughout 2009-2014. This research aims at identifying which banking regime proves to be more efficient and its significance using Financial Ratio Analysis (FRA), composed of cost efficiency, revenue efficiency and profit efficiency ratios along with the One-way ANOVA test. The impact of efficiency of the performance of the banks in terms of Return on Assets (ROA) and Return on Equity (ROE) is also evaluated through multiple regression analysis. Lastly, inflation's effect on the different banking efficiency measures will be tested using regression analysis. The findings indicate that the traditional banking system is superior in terms of cost, revenue and profit efficiencies, furthermore, the results of the multiple regression analysis on the banks' return on assets and return on equity imply that the efficiency of Islamic banks have more influence on their profitability compared to their traditional counterparts. Inflation had minimal effect on the efficiency of both banking system. The overall results imply the superiority of traditional banks to the relatively new banking system.

Keywords: *Islamic banking, traditional banking, efficiency, financial ratio analysis (FRA), multiple regression analysis, ANOVA*

1. Introduction

A causal relationship between financial institutions and economic growth has been identified, proving their profound influence on the economy in which they operate. The proficiency as well as the stability of the banking system is asserted by Awdeh [15] to be a fundamental source of economic growth and soundness.

This can be attributed to the intermediary role performed by financial institutions; where banks matches those with surplus in funds and those who lack them, it also contributes to the process of raising funds for entrepreneurs that will eventually stimulate economy as well as the society as a whole.

Furthermore, two ways are proposed by the basic endogenous growth model impacting the state of the economy. The first way suggests that savings are either positively or negatively influenced by the financial sector movement. In other words, in the prevailing state of resource scarcity, financial institutions occupy the role of allocating resources efficiently. Secondly, costs incurred during banking transactions are saved and invested, thus, reducing wastes.

The global financial crisis that could be traced back to 2007, had its toll worldwide; since it momentously impacted those in the financial banking sector and even those who are outside this specific sector, causing failure of many massive and well-known organizations such as the Lehman Brothers among many others. This was primarily caused as a result of losing record of risk when it was claimed to have been banished by giving out mortgage loans recklessly during the housing boom in USA to "subprime" debtors with unsatisfactory credit history, who eventually faced trouble in paying back these loans. Moreover, these mortgage loans were conveyed to banks which then pooled the loans together in an attempt to lower their associated risks, however, this failed due to not taking correlations of loans into consideration [93]. This shortcoming in the traditional banking system triggered an incentive to find a more resilient alternative as mentioned by Rosman, AbdWahab and Zainol [75]. Economists turned to Islamic Banks (IBs) as an alternate for Traditional Banks (TBs) after noting the stability of the relatively new banking regime and its ability to tolerate shocks throughout the years of the crisis [58]; as Islamic banks operated differently than their traditional counterparts in some aspects as affirmed by Rashwan [72].

Consequently, healthy competition between both banking regimes (i.e: Islamic and traditional systems) took place post-global crisis, shifting attention to the newly spread system that stood tall against the aftermaths of the financial crunch of 2008. Accordingly, growth levels of Islamic banks have reached a compounded annual growth rate of 17% from 2009-2013 as published in World Islamic Banking Competitiveness Report of 2014-15 by Ernest &Young [26]. The issued report also stated that in

2014, the assets of Islamic banks exceeded US$778 billion with expectations that by the year 2019, profits of Islamic banks will triple. On top of this, Islamic banks' market shares realized 48.9% in Saudi Arabia and also represented 44.6% in Kuwait while Indonesia, Pakistan and Turkey have shown indisputable progress in terms of growth in Islamic banking.

Islamic banking has proved presence in more than 100 countries. However, the non-Islamic countries represent 78% market shares with $2Tn as overall financial assets [103].

Taking into consideration all the previous information, an increasing interest in Islamic banking is expected. Currently, many researchers set out to test and compare the efficiency of the two banking regimes as the case in Viverita [97], Rashwan [72], Hanif et al. [32], Johnes, et al [44] and many others who aimed at finding out which system proved to be more efficient pre and post global crisis of 2008, using different methodologies and approaches to reach their findings. The role of the continuous monitoring process was also emphasized upon by Rose [74] and since the impact of the financial crisis still lingers till this day, thus, more empirical research with a more comprehensive sample should be conducted so as to determine whether Islamic banks are still resilient compared to traditional ones or has proven to decrease in efficiency over the years.

2. Islamic Banking

2.1. Islamic Finance Background

Islamic banking refers to a type of banking that originated in the sixth century [72] and it is defined by Organization of Islamic Conference (OIC) as:

"… a financial institution whose statutes, rules and procedures expressly state its commitment to the principles of Islamic Shariah and to the banning of the receipt and payment of interest on any of its operations."

Islamic finance is generally differentiated from traditional banking in the aspect of being based on a system of moral values and ethicality that originate from Islamic religion, abiding to the principles of Islamic law; which are the divine sanctions that serve as guides for all aspects of life and daily dealings [23].

Islam is built on three main pillars as a comprehensive religion encompassing all facets of life and was delivered by prophet Mohamed (PBUH);
1. Aqidah: reflects faith in both the being of Allah and the commands sent by Allah
2. Akhlaq: providing guidance for ethics, behaviors and attitudes.
3. Shariah: refers to the commands, values, prohibitions and guidance providing direction for Muslims. Thus, it deals with all aspects of daily life of human beings including Ibadat which is concerned with worshiping acts as well as Mumalat which focuses on daily life transactions, and it encompasses political, social and economic relations covering financial systems and transactions [2].

The rulings of Shariah that underline Islamic finance primarily originate from the Holy Quran and from Sunnah which is Prophet Mohamed's sayings and teachings [98].

However, after the death of Prophet Mohammed (PBUH) and the spread of the Islamic empire throughout many arenas, three emerging secondary sources evolved, which led Scholars to use those newly emerging sources aiming to deal with recent contemporary issues. The first secondary source was Ijma'a which represents the joint opinion of Islamic scholars and specialists on Islamic situations. The second is Qiyas in which scholars use inference on the primary sources of rulings to produce injunctions which can be applied on new circumstances. The third and the last is Ijtihad or diligence to interprets areas and problems that were not mentioned per say in the primary sources of Shariah [98].

In this regard economic and financial transactions should comply with Islamic Shariah. In other words, all economic transactions as well as financial contracts should be Halal (permitted) from a Shariah point of view. Practically, it should avoid Riba and Gharar. Riba is the fixed interest rate charged above the loan principal while Gharar (speculation) is the ambiguity in trade transactions. According to Islamic Shariah, money is a medium of exchange and not a commodity (asset) by itself [13], [72]. Although, Islamic finance recognizes the necessity of credit and risk transfers in the continuity and functionality of the economic system however, it deviates from the traditional system in the technical handling of credits and sharing risk [23]. Accordingly, Islamic finance requires the presence of an underlying asset (transaction that is asset-backed) for the contract to be acceptable opposing to traditional transactions that are not necessarily backed up by underlying-assets [11,42].

Islamic Finance can be deduced to risk sharing financial model in which the relation between parties is of partners and not creditors and debtors as the case in the traditional system; as risk is being fairly distributed between all contributed parties where profits are distributed based on an agreed upon ratio and any losses are incurred according to the party's original capital contribution ([42], [52]). Kettel [49] adds that the process of evaluating projects differ between the banking systems. As in the traditional system, loans are granted purely based on creditworthiness, conversely, Islamic banks base their decision on a more holistic outlook, as it evaluates the Shariah compatibility of the proposed project and the added value to the society, alongside with its projected profitability. The previous, as a consequence, ensures the development of both the economy and the society. Another distinctive characteristic is the inevitability of the existence of a Shariah Supervisory Board (SBB) in any Islamic Finance institution to oversee all activities; including transactions and contracts so as to ensure their compliance to Shariah [42,46].

According to Mankiw & Rashwan [54], Islamic banks' main objectives are the development of the economy as well as the society by giving out Zakats on profits actualized by the financial institution to aid the poor, orphans and any other charitable cases. Moreover, optimization of resources is highly considered and this is done by only allowing for investments that have high expectations of fulfilling both profits and more importantly social benefits. Lastly, fairness in the allocation of resources and reduction of the wealth gap in the society is another objective.

2.1.1. Islamic Financing Modes

The risk sharing model in Islamic Finance takes different modes and/or contracts, the main modes are:

a) Murabha according to Ijaz [37] is known to be one of the most widely used modes of financing when it comes to Islamic finance. Murabha is a type of sale where the incurred price of purchase of the commodity is explicitly declared by the Islamic bank; however, it offers the product at a pre-specified premium on the original purchase cost.

b) Salam is a forward contract; where an agreed upon commodity is sold with its price fully and instantly paid in advance of the delivery. This mode of finance is completely prohibited when the product is exchanged for silver, gold or currencies since any gain from the mentioned exchange will be considered contaminated with Riba [16]

c) Musharka as a term comes from "Sharika" which means sharing [37]. It is a partnership between the bank 'Rub ilmal" and the investor; in which both parties provide capital in return of a percentage of the profits or losses realized [16]. Hay'at Markaz Qatar [35] also adds that there are two types of musharkah contracts that could be exercised; the first is the permanent musharkah and the second is the diminishing type where the bank's share is gradually reduced to return complete ownership to the other party.

d) Mudarbah is another PLS contract. The partnership entails that the Islamic bank "Rubul-mal" is responsible for financing the entire capital while the other party "Mudarib" is exclusively liable for management. Regarding this method of financing, Anwar et al. [12], states that profits are shared based on an agreed upon ratio, however, concerning losses, financial loss is completely incurred by Rubul-mal, whilst the "mudarib" only stands to lose the exerted effort.

e) Ijarah is a sale contract that resembles the traditional leasing contract; in which the lessor, in this case the Islamic bank, leases an asset in exchange of predetermined rent and maintaining the ownership of the specified asset [19]. In this mode of finance, the amount of rent as well as the leasing period is agreed upon from the commencement by the parties involved [89].

Islamic finance and banking is a relatively new growing sector and has shown tremendous progress since the foundation of the first Islamic bank in Mit Ghamr, Egypt in 1963 [72], however despite this evolution, there are some challenges hindering the growth of the mentioned sector that should be addressed.

2.1.2. Challenges Facing Islamic Finance

a)   Regulatory Frameworks

When it comes to regulations, Islamic finance faces many obstacles due to the fact that most supervisory and regulatory framework do not accommodate its unique nature, this as a consequence causes lack of harmonization throughout the Islamic financial sector [39].

It was noted that Islamic banks across sectors use different frameworks; where some might follow the Accounting Auditing Organization for Islamic Financial Institutions (AAOIFI) which currently has 88 standards, while other institutions are guided by the Islamic Financial Standards Board (IFSB) [1].

Shariah compliance is not well-implemented across different banks both domestically and across-boarders causing incoherent activities and instability. It was also asserted by Baig [18] that despite the presence of accommodating environment and regulations for Islamic finance in Bahrain, UAE and Malaysia, there are still many countries with underdeveloped infrastructure for this banking regime which cause the possible occurrence of Shariah compliance risks along with operational risks

b)   Human Capital

Scarcity of qualified human capital stands as an obstacle against the evolvement of Islamic finance. As there are a few numbers of experts as well as scholars who possess the knowledge of Shariah law, along with a solid background in economics and finance [9]. Yoluker [102] asserts that lack of technical expertise is a hurdle when it comes to Islamic finance. Furthermore, Shariah principles are applied differently across institutions and scholars.

The scarcity of skilled human capital that was pointed out by Khamis et al. [50] and lack of experts allocated to Shariah boards across Islamic financial institutions, was also affirmed by Baig [18] who announced that results of a survey that was done in 2011 proved that 619 board positions are held by the top 20 Shariah scholars and this represents almost 55% of the available positions on the boards.

c)   Benchmark

Misperceptions by investors around Islamic finance are also a challenge that is driven by the previous usage of traditional-based benchmarks as LIBOR (London Interbank Offered Rate) as a pricing standard for Islamic banking products. This conveys a misguided message to investors who were led to believe that there are no fundamental differences between the Islamic and traditional banking systems [9]. However, this downfall has been amended by the formulation of the Islamic Interbank Benchmark Rate (IIBR) which is a benchmark for Islamic banks measuring profit rather than interest as the case when using traditional benchmarks [73].

d)   Lack of diversity and innovation

Another challenge is the absence of diversity in both; the sectors in which Islamic banks operate and the countries in which they operate, as Islamic banks till this day mainly operate in very specific sectors with lack of competition in addition to operating in certain Islamic countries where Islamic finance is growing without any additional expansions to other regions. This lack of diversification expose Islamic Finance institutions to "Displacement Risk" in which they incur higher returns for their investors by sacrificing some or all of their shareholders' equity profits in an attempt to give investors an incentive as not to withdraw their money [40], [82]. However, Shaikh [80] also proposes that Islamic finance could branch out into micro-financing areas such as; health and educational financing in an attempt to enlarge its current scope.

e)   Gap between theory and practice

One of the challenges facing Islamic finance is the gap that is present between the conducts by which Islamic finance should operate and what occurs in reality as stated by Iqbal [40]. As in financial institutions where profit and loss is shared by both parties, risk-sharing instruments and contracts are encouraged and are considered the basis of the system, however, the composition which should show

a higher percentage of risk-sharing instruments in its financial reports, actually show that fixed income like and short-term instruments actually have the upper hand in the composition indicating that Islamic banks are actually more inclined to dealing with trade-based instruments.

As a consequence to the previously mentioned sources of principles, Islamic banks will surely operate differently than traditional banks causing differences in efficiency [54,72].

2.2. Previous Studies

Efficiency has caught the attention of many researchers. Berger and Humphrey as cited in Tahir & Haron [90] found that the majority of the researches conducted to measure efficiency in banks throughout 130 studies, were mainly conducted in the United States and developed countries, however, efficiency of Islamic banks is still limited to some extent.

Nonetheless, when it comes to specialized Islamic financial institutions, few researchers tackled the performance of the banks regarding their determinants and profitability.

Samad [77] applied nine financial ratios on banks in Bahrain and reached a conclusion that Islamic banks showed superiority in credit performance but showed no significant difference in terms of liquidity and profitability. Viverita [97] assessed the efficiency of Islamic banks in Indonesia throughout 2006-2010 and compared their performance to traditional banks, finding proof that Islamic banks demonstrated superiority in revenue and profit efficiency. Bashir [21] also piloted a study employing regression to evaluate the performance determinants of Islamic banks by using CAMEL framework and stated that capital adequacy and loan portfolio have a significant influence on the performance of Islamic banks.

Financial ratios on five banks from Oman were calculated by Tarawneh [91] to test the connection between banks and their performance; the corresponding results from the study indicate that banks with higher profitability do not always stem from higher deposits, capital or credit. Domestic and foreign operations of Islamic banks in Malaysia were tested for four years from 2001-2004 by Sufian [87]. The researcher found that a positive correlation exists between profitability and all efficiency measures used; meaning that profitability of Islamic banks depends on their perceived efficiency.

Financial ratio analysis were also used in conjunction with Data Envelopment Analysis (DEA) to provide more reliable findings by Johnes et al. [44] by using six financial ratios; concluding that in terms of revenue and profit efficiency, Islamic banks were superior while they proved to be less effective in managing their costs, thus, proving that the overall efficiency in traditional banks is better than Islamic banks in the given sample.

Sehrish et al [79] applied financial ratio analysis on 8 banks in Pakistan throughout 2007-2011 using six financial ratios namely; profitability ratios, efficiency ratios and lastly credit risk ratios. This study generated results that indicate that concerning loans, Islamic banks proved to be less risky whilst being less efficient in managing expenses compared to traditional banks. While in terms of profitability, both banking regimes were similar in results. The research ended with a conclusion that the overall performance of Islamic banks was found to be satisfactory.

Johnes et al. [44] suggests that the reason behind the wide-use of financial ratio analysis is due to its great benefits as besides its simplicity in calculations; it primarily takes into consideration the disparities between banks in the sample due to the variances in banks' sizes. Accordingly, size disparities in sample are removed by bringing them at par ([44,77,91]). Furthermore, the use of financial ratio analysis gives researcher freedom in choosing the ratios as there are no restrictions.

However, in 2014, when using both financial ratio analysis and data envelopment analysis to complement each other in the Gulf Cooperation Countries (GCC) region within the period from 2004-2007, Islamic banks proved to be better than traditional banks in terms of profit and revenue efficiency while inferior in cost efficiency when using financial ratio analysis while according to the data envelopment analysis, Islamic banks proved to have lower average efficiency and this was credited to operating under Shariah laws not lack of managerial competence [47].

The inconsistency in results can be attributed to differences in time periods, sample sizes, sizes of banks and the fact that Islamic banks are relatively new in the industry.

When reviewing past studies, it is noticeable that there is scarcity in studies answering the question of which banking regime is superior and what influences its efficiency by applying the Financial Ratio analysis on a more comprehensive population of Islamic banks and their conventional counterparts during the last 6 years and thus, this is the contribution of this researcher to the literature.

3. Aims and Methodology

3.1. Research Aims

In light of the previously mentioned importance of efficiency in the banking industry, the purpose of this research is to comparatively evaluate the efficiency of Islamic banks and their comparable traditional banks, in order to reach a conclusion of which banking sector has proved to be more cost, profit and revenue efficient during the period being examined and to determine if efficiency is mostly impacted by the context in which the banks operate. The research also aims at identifying whether efficiency impacts profitability or not and to test the impact of inflation on the banks' efficiency levels, as the results will provide guidance about the growth of Islamic banking and where the resources will be channeled in the future.

Thus, the research aiming to answering the following questions:

- How efficient are the chosen traditional banks and Islamic banks in terms of profit, revenue and cost?
- Which banking sector is superior in terms of overall efficiency?
- Does efficiency affect banks' profitability in terms of return on assets and return on equity?
- What is the impact of chosen macroeconomic factor (inflation) on the banks' efficiencies?

Hypothesis:

H_0: There are significant differences between Islamic and traditional banks in terms of cost to income.

H_0: There are significant differences between Islamic and traditional banks in terms of non-interest expense to average assets

H_0: There are significant differences between Islamic and traditional banks in terms of net interest margin

H_0: There are significant differences between Islamic and traditional banks in terms of other operating income to average assets

H_0: There are significant differences between Islamic and traditional banks in terms of return on assets

H_0: There are significant differences between Islamic and traditional banks in terms of return on equity

3.2. Research Design

3.2.1. Sample Size

Sample was originally set to include the top 50 fully-fledged Islamic banks along with their corresponding comparable traditional banks in terms of the bank's total assets as previously done in studies conducted by Moemen [66] and Merchant [57], making a total sample of 100 banks; this allows the comparison to be done between the topmost levels of both banking regimes. However, due to lack of data in the chosen period of 2009-2014, only data for 66 banks was completely and successfully compiled; half of which are Islamic banks while the other half is composed of traditional banks. Most of the chosen banks in the sample are mentioned in a report published by Global Finance [30] ranking the world's best Islamic financial institutions. The chosen banks are located in 12 different countries ranging from 4 banks in Egypt to 10 in Bangladesh, 4 in Sudan, 2 in Pakistan, 8 in Bahrain, 6 in Qatar, 2 in Turkey, 6 in KSA, 10 in UAE, 2 in Iraq, 4 in Jordan and finally 8 in Kuwait as will be shown in Table 3 below:

Table 1. List of Banks in Sample

Islamic Banks	Traditional Banks
Egypt	
Faisal Islamic Bank of Egypt	Commercial International Bank (Egypt) S.A.E.
Al Baraka Bank Egypt SAE	Credit Agricole Egypt
Bangladesh	
Islami Bank Bangladesh Limited	Prime Bank Limited
Export Import Bank of Bangladesh	Pubali Bank Limited
Al-Arafah Islami Bank Ltd.	United Commercial Bank Ltd
First Security Islami Bank Limited	Southeast Bank Limited
Shahjalal Islami Bank Ltd	AB Bank Ltd
Kuwait	
Kuwait Finance House	National Bank of Kuwait S.A.K.
Ahli United Bank KSC	Burgan Bank SAK
Boubyan Bank KSC	Gulf Bank KSC (The)
Kuwait International Bank	Commercial Bank of Kuwait SAK (The)
Sudan	
Bank of Khartoum	Omdurman National Bank
Pakistan	
Meezan Bank Limited	National Bank of Pakistan
BankIslami Pakistan Limited	Habib Bank Limited
Bahrain	
Albaraka Banking Group B.S.C.	Ahli United Bank BSC
Bahrain Islamic Bank B.S.C.	Arab Banking Corporation BSC
Khaleeji Commercial Bank	BBK B.S.C.
Gulf Finance House BSC	National Bank of Bahrain
Qatar	
Qatar International Islamic Bank	Qatar National Bank
Masraf Al Rayan (Q.S.C.)	Commercial Bank of Qatar (The) QSC
Qatar Islamic Bank SAQ	Doha Bank
Turkey	
Asya Katilim Bankasi AS-Bank Asya	Turkiye is Bankasi A.S. - ISBANK
KSA	
Al Rajhi Bank	National Commercial Bank (The)
Alinma Bank	Riyad Bank
Bank Al-Jazira	Saudi British Bank (The)
UAE	
Dubai Islamic Bank PJSC	National Bank of Abu Dhabi
Abu Dhabi Islamic Bank	Emirates NBD PJSC
Emirates Islamic Bank PJSC	First Gulf Bank
Sharjah Islamic Bank	Abu Dhabi Commercial Bank
Ajman Bank	Union National Bank
Iraq	
Kurdistan International Bank	Bank of Baghdad
Jordan	
Jordan Islamic Bank	Arab Bank Plc
Jordan Dubai Islamic Bank	Housing Bank for Trade & Finance (The)

3.2.2. Analysis Methods

The performance of both sets of banks individually and collectively will be assessed through the methodical analysis of their descriptive statistics that help in meaningfully summarizing the data at hand to represent any patterns or variations; this includes inspecting their minimum, maximum and means.

The one-way ANOVA t-test at 95% confidence level will be run to indicate the significance of differences between both banks types according to each variable.

Multiple linear regression will also be applied to assess the impact of internal factor which is the overall efficiency of banks (independent) on their corresponding profitability (dependent) to identify whether there exists a relationship between both.

Single linear regression will also be used to test the influence of inflation, an external/macroeconomic variable on the efficiency of the banks [50].

3.2.3. Model Stipulation

The first proposed model will test the impact of cost and revenue efficiencies on profitability of the banks by using the succeeding regression model

$$\text{ROA} = \alpha + \beta_1\left(CTI\right) + \beta_2\left(NIE\right) + \beta_3\left(NIM\right) + \beta_4\left(OOI\right) + \varepsilon \quad (1)$$

$$ROE = \alpha + \beta_1\left(CTI\right) + \beta_2\left(NIE\right) + \beta_3\left(NIM\right) + \beta_4\left(OOI\right) + \varepsilon \quad (2)$$

The second model aims to discover the impact of inflation on each efficiency dimension of the chosen banks through

$$CTI = \alpha + \beta_1\left(INF\right) + \varepsilon \quad (3)$$

$$NIE = \alpha + \beta_1\left(INF\right) + \varepsilon \quad (4)$$

$$NIM = \alpha + \beta_1\left(INF\right) + \varepsilon \quad (5)$$

$$OOI = \alpha + \beta_1\left(INF\right) + \varepsilon \quad (6)$$

3.2.4. Variables Identification:

Table 2. Variable Identification

Efficiency Ratios		
Cost Efficiency Ratios		
Cost-to-income (CTI)	Overheads/(Net Interest Revenue + Other Income)]*100 where Overheads are mostly salaries	The lower, the better
Non-interest expense to average assets (NIE)	[(Overheads + Loan Loss Provisions)/Average Total Assets]*100	The lower, the better
Revenue Efficiency Ratios		
Net interest margin (NIM)	[Net Interest Revenue/Average Total Earning Assets]*100	The higher, the better
Other operating income to average assets (OOI)	[Other Operating Income/Average Total Assets]*100	The higher, the better
Profit Efficiency Ratios		
Return on average assets (ROA)	[Net Income/ Average Total Assets]*100	The higher, the better
Return on average equity (ROE)	[Net Income/ Average Equity]*100	The higher, the better

Banking efficiency is measured using three financial groups as conducted by Johnes et al. [44] and Hanif et al. [32]. The financial ratios sets are as follows:

Cost efficiency is considered as a decision-making tool as it aids management in identifying the most economically resourceful way to reach the bank's objective whether it is profit maximization as the case with traditional banks or else wise as in Islamic banks. Shen, Liao & Jones [81] state that this analysis measure shows the closeness of the bank's cost to the highest performing bank at the same conditions and output level. Many reasons for concentrating on banks' cost efficiency are mentioned by Fries & Taci [27]. The first is that this measurement indicates progress, moreover, the higher the cost efficiency, the higher the gains. This is due to reduced costs of operations and thus, more savings that could be better utilized in investments, consequently leading to better overall development in the economy. Another reason implies an association between cost reduction and other bank performance dimension. In this aspect, the researcher used two ratios; cost to income which has been used by Johnes [44], Hanif, et al [32] and Tripe [94] affirming that the lower the ratio, the better the bank's performance, another ratio used is non-interest expense to total average assets which is also stated to have an inverted relation with efficiency.

The second set is revenue efficiency comprised of net interest margin ratio measuring the spread between interest costs and revenues that was achieved by management upon pursuing the cheapest fund sources indicating the bank's judgment in loans investment [74], it also consists of income to average assets testing the ability of the bank to generate revenue aside from its main operations.

Lastly, Profit efficiency ratios entailing return on assets; a key profitability measure especially in banks, evaluates managerial efficiency in generating net earnings from the available assets by measuring the per dollar earning for assets [29]. Another profitability ratio that is of great concern specifically for shareholders and is usually evaluated by them in advance to making an investment decision, is the return on equity which is calculated with an aim of identifying the return that shareholders receive on their investment in the bank, thus, it gives an indication of the bank's given efficiency in converting each dollar invested in equity to profits ([61] – [30]).

The last variable is inflation which is a macroeconomic variable. It is obtained for the chosen countries and period from the World Bank Data.

4. Data Analysis

4.1. Descriptive Statistics
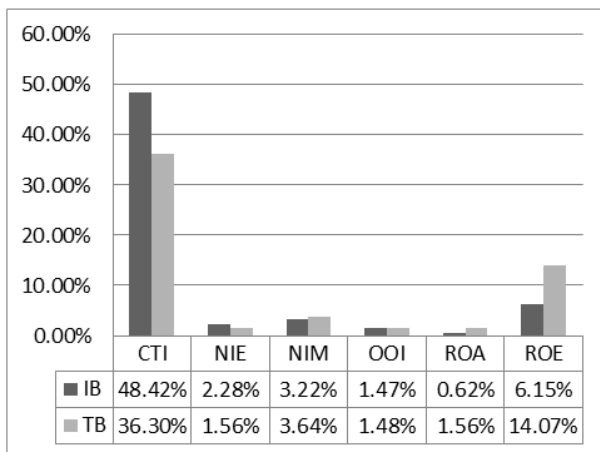
Table 3. Descriptive Statistics – All Banks

All Banks				
	Mean	**S.D**	**Min**	**Max**
CTI	0.423562374	0.182968523	-0.05	1.5656
NIE	0.019239519	0.024631044	0.004769545	0.465927457
NIM	0.034291548	0.034931761	-0.053660457	0.493936153
OOI	0.014753052	0.015869219	-0.012116698	0.134387709
ROA	0.01089517	0.035905596	-0.547566247	0.041550793
ROE	0.101059654	0.206026867	-2.650655022	1.024318105

Table 4. Descriptive Statistics – Traditional Banks

Traditional Banks				
	Mean	S.D	Min	Max
CTI	36.30%	0.105341185	0.072	0.6427
NIE	0.015645671	0.006710979	0.004769545	0.006710979
NIM	0.036372828	0.04533963	0	0.493936153
OOI	0.014784422	0.010963293	0.004996838	0.094152347
ROA	1.56%	0.006546268	-0.005951387	0.030290011
ROE	14.07%	0.112653845	-0.067925836	1.024318105

Table 5. Descriptive Statistics – Islamic Banks

Islamic Banks				
	Mean	S.D	Min	Max
CTI	48.42%	0.220553236	-0.05	1.5656
NIE	0.022833367	0.033844592	0.005276618	0.465927457
NIM	0.032204013	0.021444491	-0.053660457	0.248512888
OOI	0.014721681	0.015869219	-0.012116698	0.134387709
ROA	0.62%	0.049977368	-0.547566247	0.041550793
ROE	6.15%	0.263180495	-2.650655022	0.31312175

	CTI	NIE	NIM	OOI	ROA	ROE
IB	48.42%	2.28%	3.22%	1.47%	0.62%	6.15%
TB	36.30%	1.56%	3.64%	1.48%	1.56%	14.07%

Figure 1. Descriptive Statistics for IBs and TBs

Cost efficiency ratios are divided into two measures. Firstly, the cost to income ratio which indicates that traditional banks were more cost efficient.

Despite the fact that the non-interest expense compared to the average of total assets is lower in traditional banks proving more efficiency in cost management, however, the variance between traditional banks and Islamic banks in this measure is not significant, however, it is comprehensible as Islamic banks incur more costs as those for maintaining a Shariah board as well as higher administrative and legal fees due to the complex nature of the products offered by Islamic banks [44]. However, the findings contradict those of Ahmad & Hassan [5].

Revenue efficiency is assessed by net interest margin; indicating effectiveness in choices of fund-raising as well as loans selectivity is more in traditional banks (3.64%) although it was a close tie as Islamic banks were at 3.22;. This is clarified by Ahmad [6] stating that this is due to the more costly processes incurred in Islamic banks due to PLS and probability of lower revenues as their main aim is not maximization of profits.

The results of the other-operating income to average assets is quite similar in both bank types as traditional banks had a mean of 1.48% against 1.472% in Islamic banks, this entails the superior operational performance of traditional banks credited to more experience and know-hows [6].

When it comes to the profitability ratios set, the mean of the return on assets in Islamic banks was only 0.62% while in traditional banks; it was more than double Islamic banks return on assets' at 1.56%, indicating that traditional banks maintain superiority in managerial efficiency and their ability to generate cash from their possessed assets which eventually causes more profitability. According to Onakoya & Onakoya [68], the previous can be attributed to the inferior quality of loans in Islamic banks specifically or the banks' assets in general as they incur more in loan loss provisions than traditional banks and this is understandable due to the PLS paradigm of Islamic banks . This result is affirmed by Islam, Alam & Hossien [41] during their study as well as Hanif [32] while contradicting with the result provided by Johnes et al [44].

Traditional banks also excel in return on equity where it was successful in obtaining 14.07%, opposed to only 6.15% in Islamic banks, representing a massive variance between the two sectors. This difference can be attributed to the extreme outliers present in the sample of Islamic banks where banks such as; Bankislami Pakistan, Gulf Finance House, Bahrain Islamic bank and Boubyan bank suffered from high losses in some years. This also assures the higher profitability in traditional banks as they were competent enough to transform equity investments into profits and thus, appealing more to investors. Scholars as Moin [59] and Paul et al [69] generated similar results regarding this measure.

As seen previously upon viewing the descriptive statistics, there occurred some variations between the efficiency of bank types; however, traditional banks proved superiority in all efficiency measures, whether in cost, revenue or profit competence. Many scholars attempted to explain the variances that happen between the measures of Islamic and traditional banking and tried to explain why traditional banking system appears more capable of efficiently managing their resources. Some might suggest that the superiority of traditional banks is because of the longer experience in the banking sector as the Islamic banking regime is still considerably new to the finance world [90].

Another proposed reason is the lack of qualified human resources that lead to less expertise in the working environment and less best practices in Islamic banks as mentioned by Yoluker [102]. Additionally, in regards of cost efficiency, the heated competition between traditional banks acts as a strong incentive for increasing the operational efficiency of the financial entities, whereas, Islamic banks, competition is apparently not as strong [43]. The unaccommodating environment for Islamic banks and absence of strict regulatory bodies and guidelines provide liberty for Islamic banks to act as they wish without any constraints, consequently, causing less supervision on how the internal operations of the banks are running and this is specially the case in some countries in the chosen sample as; Syria, Iraq, Egypt, Jordan and Pakistan. In the aspect of profitability efficiency measures, Islamic banks are inferior because of the numerous limitations that they face in their operations as traditional banks have the ability and access to much more lucrative investments than those operating under the conditions of Islamic banks [22], this is a consequence of rejecting profitable investments as those involved in alcohol or gambling, as well as having portfolios that are much less diversified as cited in Islam, Alam & Hossain [44].

Table 6. Comparison Between IBs and TBs

Efficiency Ratio	Islamic Banks	Traditional Banks	Comment
Cost Efficiency			
CTI	48.42%	36.30%	TBs are more efficient
NIE	2.28%	1.56%	TBs are more efficient
Revenue Efficiency			
NIM	3.22%	3.64%	TBs are more efficient – close results
OOI	1.472%	1.48%	TBs are more efficient – close results
Profit Efficiency			
ROA	0.62%	1.56%	TBs are more efficient
ROE	6.15%	14.07%	TBs are more efficient

4.2. One-way Anova Test

One-way Anova test is conducted on the cost, revenue and profit efficiency ratios so as to test the pre-set hypothesis to determine whether the differences that appeared between Islamic banks and traditional banks in these measures were that of significance or not.

Hypothesis

H_0: There are no significant differences between Islamic banks and traditional banks

H_1: There are significant differences between Islamic banks and traditional banks

Since the p-value on conducting the one-way Anova test on cost to income resulted in 0.000<0.05, thus, the null hypotheses H_0 stating that there are no significant differences between the cost to income in Islamic banks and traditional banks is rejected. These results confirm those of Viverita [97].

Non-interest expense to average assets' p-value was less than 0.05 at 0.004, leading to the rejection of the null hypothesis and discarding the possibility that non-interest expense to average assets is the same for both banking regimes, agreeing with the decision of Viverita [97].

When it comes to revenue efficiency, p-value of net interest margin of 0.243>0.05 causing the researcher not to reject H_0 and signaling that there are no major differences between the net interest margins of the banks in the sample and this also goes for other operating income to average assets which resulted in a p-value of 0.964>0.05. This finding also agrees with those of Viverita [97].

Concerning the profit efficiency, return on assets (p-value 0.009<0.05) and return on equity (p-value 0.000) appear to have significant differences between those values of Islamic banks and those of traditional banks and these results are consistent with the ones generated by Siraj & Pillai [83] on Islamic and Traditional banks in the Gulf Cooperation Countries Region.

Table 7. Anova Test Output

		Sum of Squares	DF	Mean Squares	F	Sig
ONE WAY ANOVA TEST						
CTI	Between Groups	1.455	1	1.455	48.702	0.000
	Within Groups	11.769	394	0.030		
	Total	13.224	395			
NIE	Between Groups	0.005	1	0.005	8.592	0.004
	Within Groups	0.235	394	0.001		
	Total	0.240	395			
NIM	Between Groups	0.002	1	0.002	1.368	0.243
	Within Groups	0.496	394	0.001		
	Total	0.497	395			
OOI	Between Groups	0.000	1	0.000	0.002	0.964
	Within Groups	0.073	394	0.000		
	Total	0.073	395			
ROA	Between Groups	0.009	1	0.009	6.912	0.009
	Within Groups	0.5	394	0.001		
	Total	0.509	395			
ROE	Between Groups	0.613	1	0.613	14.870	0.000
	Within Groups	16.229	394	0.041		
	Total	16.841	395			

4.3. Regression Analysis

4.3.1 Impact of Efficiency on Profitability

When assessing the impact of a bank's efficiency on its profitability, four regression models were run at 95% confidence level so as to determine the effect of cost to income, non-interest expense to average assets, net interest margin and other operating income to average assets (independent variables) on both return on assets and return on equity (dependent) individually for the two bank types at hand.

Firstly, after regression models were run for return on assets, an evaluation of the resulting output was completed. Initially, the multi-collinearity between the independent variables was reviewed; it appeared that in the case of Islamic banks, none of the variables had a correlation of more than 0.35 which signals the start of a moderate to high correlation, this indicates that the relationship found between independent variables will not distort the findings. On another point, the relationships of the independent

variables on return on assets of Islamic banks were assessed giving the following results;

Cost to income in Islamic banks had a negative, very weak relationship with return on assets; however, this was significant at 90% confidence rather than 95%, whereas, in traditional banks, cost to income shared the same negative correlation, though, the relationship was not as weak. These results appear rational as whenever the costs compared to income increases, this would consequently decrease the bank's assumed profitability, proving to be consistent with the findings of Sufian & Chong [86] and Hess & Franics [36] who assure that poor management of costs is a main cause of reduced profitability.

Return on assets of Islamic banks had a negative strong relationship with non-interest expense to average assets opposed to the weak positive correlation found in traditional banks. The negative relationship is logical in the case of Islamic banks as high costs in terms of non-interest expense should as consequence lead to a decrease in the return of the bank as indicated by Ahmed & Hassan [5] an agreeing with findings of Imane [38].

Both Islamic banks and traditional banks shared the same positive relation with net interest margin indicating the direct effect of net interest margin on both types of banks' profitability coinciding with the revelations of Lartey et al. [53] signaling the ability of the banks to increase profit using their assets using their interest income (net) along with the available interest earning assets.

When it comes to other operating income to average assets, Islamic banks and traditional banks also shared a positive relationship wither corresponding return on assets, however traditional banks showed a slightly higher relationship guaranteeing the increase of return on assets whenever the other operating income relative to total assets escalate [104].

Both regression models appear to be highly significant with highly significant independent variables except for net interest margin and other operating income to average assets in traditional banks which does not appear significant at either 5% or 10%, moreover, Islamic banks model have an R-square of almost 75% and 19.62% in the traditional counterpart. The regression produced the following models:

$$ROA_{IB} = 0.017CTI - 1.22NIE$$
$$+ 0.530NIM + 0.884OOI \qquad (7)$$

$$ROA_{CB} = 0.0211 - 0.0274CTI$$
$$+ 0.216NIE + 0.006NIM + 0.05OOI \qquad (8)$$

Transitioning on to the impact of efficiency on profitability measures in terms of return on equity, corresponding to the insights of Ongore et al [67] and Tripe [94] regarding return on equity and cost to income ratio, there appears to be a negative relationship between them and this relation is insignificant, the researchers goes on stating that any general conclusions entailing the impact of cost to income on return on equity would appear to be unwise. On the other hand, Imane [38] argues the opposite, stating that there lies a significant relationship between the variables in Islamic banks.

Non-interest expense to average assets had negative relationships with Islamic banks regime however, the

relationship proved to be stronger and significant in the case of Islamic banks only, while insignificant in their opposing traditional banks. The previous is a result of the higher level of provisions in Islamic banks as they operate by the PLS paradigm and the much higher legal costs and costs of having a Shariah board to supervise operations of the bank [44].

Highly significant positive net interest margin relationships with return on equity appear on Islamic banks only confirming the successfulness of the banks in accumulating more returns for their shareholders using their generated net interest income from operations [84].

Other operating income to average assets demonstrated very high significance level with positive sign in Islamic banks while it appeared insignificant in increasing traditional banks' return on equity as traditional banks mainly depend on interest-based transactions

Models prepared for the previous regressions appear to be highly significant and have an R-square of 66.9% in case of Islamic banks and 3.22% in traditional banks, however, it should be noted that in traditional banks, there were high correlations between net interest margin and non-interest expense to average assets, other operating income to average assets and non-interest expense to average assets as well as other operating income to average assets and net interest margin and this could have distorted the results somehow. The models produced are as follow:

$$ROE_{IB} = 0.0602 - 0.0005CTI$$
$$- 6.137NIE + 2.701NIM + 3.69OOI \qquad (9)$$

$$ROE_{CB} = 0.068 + 0.157CTI \qquad (10)$$

Table 8. Regression Analysis Output - ROA & ROE

	ROA	ROE
Constant	-0.004	0.06
	0.46	*0.08*
	0.0211	0.068
	*0.000**	*0.026**
CTI	0.017	0
	0.039	*0.99*
	-0.0274	0.157
	*0.000**	*0.064*
NIE	-1.22	-6.13
	*0.000**	*0.000**
	0.2164	1.014
	*0.008**	*0.509*
NIM	0.53	2.7
	*0.000**	*0.000**
	0.0068	0.068
	0.511	*0.729*
OOI	0.88	3.69
	*0.000**	*0.000**
	0.05	-0.237
	0.21	*0.764*
R-Square	*0.75*	*0.669*
	0.19	*0.03*
Adjusted R-Square	0.745	0.662
	0.179	*0.012*
SSE	*0.1228*	*4.5*
	0.0067	*0.08*
P-Value	*0.000**	*0.000**
	*0.000**	*0.17*
NOTE: The results highlighted are those of Ibs while those In *italic* are the p-values		
* significant at 5%		

4.3.2. Impact of inflation on efficiency measure

In order to investigate the effect of the macroeconomic variables which is inflation on the calculated bank efficiency as done by Simar & Wilson (2007) , Pasirouras (2009) and Papanikoloua (2009) [55] along with many other, regression models were set up and the resulting impacts are discussed below.

Profitability efficiency that consists of return on assets and return on equity measures showed a positive yet completely insignificant relationship with the inflation in both Islamic banks and traditional banks that compromise the sample within the period of 2009-2014, the generated result from the regression model opposed our pre-set expectations as it was assumed that inflation would appear to have great influence on profitability measures, however, These results are also supported by Sufian et al [88] while contradicts those by Agade [4] and Delis [58]. When moving on to assessing the impact on return on equity, it appears that Islamic banks are minimally affected by inflation as explained earlier and Bashir [20] confirms that inflation has no significant relationship with return on equity, thus, is considered irrelevant when assessing the profitability of Islamic banks, whereas, traditional banks also showed an insignificant relationship. On another point, cost to income as a measure of cost efficiency is not substantially influenced by changes in macroeconomic variables as inflation levels in both Islamic banks and traditional banks as the significance levels were much higher than 0.05 leading to discarding its importance as an indicator. This is could be a signal of the lending risks involved in banks as stated by Hassan & Lewis [38] since banks might be more involved in lending to sovereign governments which is less in risk than lending to either individuals or establishments.

Inflation has an insignificant relationship with non-interest expense to average assets in Islamic banks, conversely, it appears to be very influential on the non-interest expense to average assets ratio in traditional banks, Raphael [69] explains this phenomena by stating that the reason might be attributed to the slower growth of non-interest expenses in commercial banks compared to inflation rate, as the opposite case will eventually have its toll on the efficiency of the bank.

In Islamic banks, inflation had no considerable effect on the net interest margin of the banks opposed to results of Vong & Hoi [108], however, it should be taken into consideration that Islamic banks are not involved in transactions involving interest rates might play a role in the insignificance of inflation [100], while it proved to be highly influential at 5% significance level in traditional banks, proving to be consistent with the empirical findings of Khan et al [51] and those of Ongore & Kusa [67] on commercial banks of Kenya and this suggests that the positive relationship is an indicator of the banks' ability to adjust their interest rates causing an increase in their corresponding profits ([70]-[100]).

Results in Islamic banks prove to be insignificant and results of traditional banks indicate high positive significance of other operating income to average assets ratio with the inflation rate that correspond the countries compromising the sample during the period set for the research, indicating the banks' ability in making amendments that insure stabilization of this income source

against the movements of inflation, thus, generating higher income whenever inflation rises [6].

Table 9. Regression - Inflation

	Inflation	
	Islamic	Traditional
CTI	-0.096	-0.061
	0.7194	*0.108*
NIE	-0.0455	0.0158
	0.051	*0.000**
NIM	0.019	0.085
	0.206	0.006*
OOI	0.311	0.233
	0.000*	*0.002**
ROA	0.021	0.043
	0.16	0.69
ROE	0.136	0.103
	0.043	*0.9*
Values in italic are p-values		
* Significant at 5%		

5. Conclusion

5.1. Key Aims and Findings

In conclusion of this empirical research that was conducted on a sample of 66 banks compromising an equal number of Islamic and traditional banks in various regions throughout the period of 2009-2014, in order to identify which banking regime excels more in efficiency measures in terms of cost, revenue and profit and the significance of the results, additionally, the impact of these efficiency on bank profitability in terms return on assets and return on equity. Finally, the research tested the influence of inflation as proxy for external macroeconomic on each efficiency measure.

The empirical findings of the first aim indicates that traditional banks excel in cost efficiency measure in both variables; cost to income and non-interest expense to average assets, however, in reference to non-interest expense to average assets, both Islamic banks and traditional banks had close results. Also, traditional banks proved to be more efficient in revenue efficiency which includes net interest margin and other operating income to average assets, however, both results demonstrated close-ties between the two banking systems. Finally in regards to profit efficiency, traditional banks were superior in return on assets and achieved results that almost doubled those of the corresponding Islamic banks and they also outperformed Islamic banks in return on equity measure as traditional banks have profit-maximization as their main goal, however, this is not always the case with fully-fledged Islamic banks.

While the outcomes of the research second aim revealed that when testing the effect of cost and revenue efficiency on return on assets, both Islamic banks and traditional banks were significantly impacted by non-interest expense to average assets which gave contradicting results due to the appearance of the positive relationship and other operating income to average assets. While differences between types of banks lied in net interest margin and cost to income as only Islamic banks were impacted by net interest margin and cost to income

had a significant consequence in the cases of traditional banks solely. On the other hand, when the same test was conducted on return on equity, non-interest expense to average assets, net interest margin and other operating income to average assets were significant in Islamic banks while net interest margin was the only variable that is considered influential in traditional banks' return on equity. The previous points imply that the efficiency of Islamic banks has more impact on their profitability in contrast to traditional banks.

In testing the inflation's influence on banking efficiency, the third aim of the study, it was immaterial on cost to income on both types, while inflation proved to be insignificant on non-interest expense to average assets in Islamic banks and the opposite in traditional banks. On moving to revenue efficiency, inflation had its toll on other operating income to average assets in the two cases at hand while its impact on net interest margin was only significant with traditional banks. On reviewing the results on profit efficiency, it was inconsequential for both regimes on return on assets and return on equity.

On compiling the overall results of the different tests conducted, we claim that the traditional banking system outshines the newly spread Islamic banking system in various measures, thus, more efforts and continuous enhancements should be done by Islamic banks so as to catch up with the traditional banks.

5.2. Implications of theory

When evaluating whether the findings are coherent with the theory behind them, it appears that with regards to comparing the overall efficiency of Islamic and traditional banking, the dominance of traditional banks is understandable and somehow expected since they have more experience and more presence in the financial sector and the economy, moreover, this could be attributed to the better and supplementary access to investment opportunities for traditional banks and intense competition leading them to be forced to improve their efficiency as not to drop out of the market in which they operate.

Additionally regarding the higher profitability efficiency, it harmonies to the well-known goal that is set by traditional banks' managers and shareholders of generating highest possible profit and maximizing value, rather than spreading more justice and equality as the case with Islamic banks. In other words the more restrictions in Islamic banks the less efficient they are.

Measuring whether an increase in efficiency will lead to changes in profitability generated results that were somehow doubtful as cost to income did not have an everlasting influence on return on assets in Islamic banks were it was assumed that whenever costs-to-income would decrease, this would lead to a higher return on assets, this also goes to the case of return on equity. Another noticeable result is the positive significant relationship between return on assets of traditional banks and non-interest expense to average assets as orthodoxly, the higher the expenses as in the case of non-interest one, the lower the profitability, thus, a negative relationship was anticipated rather than a positive one. The results related to return on equity in Islamic banks were consistent to theory while the fact that only net interest margin significantly had an impact on return on equity of traditional banks was doubtful.

The fact that inflation as a macroeconomic variable appeared to have an immaterial consequence on profitability was opposed to theory underlying return on assets and return on equity and the underlying expectations of the outcomes, this is also the case in regards to cost to income where it was expected that whenever inflation increases, costs in respect to income will accordingly increase, alternatively, result of non-interest expense to average assets were convincible as well as those of net interest margin and other operating income to average assets.

5.3. Impact of Scale Differences between Traditional and Islamic Banks

It should also be taken into account that the chosen sample includes the top 50 banks from both Islamic and traditional banking sectors. This implies that there might be differences in scale with regards to total assets between the banking regimes; where some of the traditional banks might be more superior in term of total assets to some of the Islamic banks in the selected sample. Theoretically the large scale of total assets should have a positive impact on bank efficiency. A size bias may occur as larger banks tend to have higher profits [24]. That is, large banks may (arguably mistakenly) be labeled as having higher standard profit efficiency than smaller banks, by virtue of the fact that small banks simply cannot reach the same output levels which is the case when comparing traditional banks to Islamic ones. However, whereas all banks appear to perform rather similarly in terms of cost efficiency, in terms of profit efficiency large general banks and specialized bank clearly outperform small, general banks as they can benefit from large size and perhaps market power [62].

5.4. Research Limitations

The undertaken research faced multiple limitations, the first and most importantly is the lack of complete financial data for the banks that were first chosen for the sample; as most of the banks in the sample have not yet published their annual reports of 2015 thus, causing the researcher not to include the most recent year in the study and only working on a 6-year panel data from 2009 to 2014. Additionally, some of the less recent years were incomplete, leading to shrinking the sample from 100 banks to 66 banks only which as a consequence resulted in leaving out some countries as Iran from the final set of chosen banks. Another limitation that most probably had a distortional impact in the results is the different banks sizes as well as the political conditions prevailing in some countries as the case in Syria, Egypt and Sudan causing performance of these banks to be inferior to those in more stable regions. Also conflict in results appeared when assessing the impact of non-interest expense to average assets in traditional banks on return on assets where a positive relation appeared and this is not logical as higher expenses usually report lower profitability.

5.5. Direction for Future Research

Islamic finance is increasing more and more each day and is being widely spread across the world not only in regions were Islamic religion prevails, moreover, the

majority of the clients are not necessarily following the same religion. Islamic finance proved its importance and resilience to shocks even thou

Although it might be somehow not as superior as the traditional banking sector, but it should be taken into consideration that this regime of banking is still considerably new and is facing multiple challenges and obstacles as previously mentioned, that are not easily resolved and have a huge toll on its perspective performance. And due to the considerable emphasis that scholars put on the potentials of Islamic finance and the vibrant change it would cause in the financial sector, more research should be conducted to discover ways in which Islamic finance could overcome the obstacles that is hindering its performance compared to the traditional banks present in the economy. More investigation should address the relationship between non-interest expense to average assets and return on assets in traditional banks so as to justify the positive relationship between the two variables. Furthermore, these researches should be more comprehensive as in including more banks in the sample that compromise all the countries in which Islamic finance operate in as well as take into consideration a bigger time scale so as to observe the impact of country-specific variables, time and not counting the macroeconomic variables that impact the banks performance in terms of efficiency. Another aspect that requires attention is the bank-specific factors which might entail the regulations that are specifically tailored for Islamic banking and the novelty of products being offered the quality of the Shariah boards and efficient operational management. Finally, more rigorous mathematical tools should be used in comparison to reflect the different in scale between Islamic banks and its counterparts. For the mentioned reasons, continual research in the topic of Islamic finance is a must so as to provide further amendments to the sector in order to be more competitive with traditional banks and to yield the most benefits to the development of the economies.

Databases

Bankscope (2015). Bureau Van Dijk.*'Financial Statements'*. Retrieved from https://bankscope.b.vdinfo.com/version-2016419/home.serv?product=scope2006

Oanda (2015). *'Currencies Exchange Rates'*. Retrieved from https://www.oanda.com/.

World Bank Data (2015).*'Real Interest Rates'*. Retrieved from http://data.worldbank.org/indicator/FR.INR.RINR.

References

[1] AAOIFI. (2015).'About AAOIFI'. Retrieved from http://www.aaoifi.com/en/about-aaoifi/about-aaoifi.html

[2] Abdullah, M, et al. (2011*). Fundamentals of Shariah*. Financial Sector Talent Enrishment Program. Retrieved from http://www.ibbm.org.my/pdf/FSTEP%20Fundamentals%20of%20 Shariah-1ST%20DAY.pdf.

[3] Abdul-Majid, M et al., (2010). *Efficiency in Islamic and Traditional banking: an international comparison*. Journal of Productivity Analysis, 34(1), 25-43.

[4] Agade, R. (2014). 'The Effect of Macroeconomic Variables on Operational Efficiency of Banking Sector in Kenya'. University of Nairobi: Kenya.

[5] Ahmad, A. F., & Hassan, M. K. (2007). Regulation and performance of Islamic banking in Bangladesh. *Thunderbird International Business Review*, *49*(2), 251-277.

[6] Ahmad, AUF. (2010). 'Developments in Islamic Banking Practices: The Experience of Bangladesh'. Universal Publishers: Florida, USA.

[7] Ahmad, M. & Pandey, D. (2010). 'Are Islamic banks better immunized than Traditional banks in the current economic crisis?'. 10th Global Conference on Business & Economics.

[8] Ahmed, S & Abdul Rahman, A. (2012) "*The efficiency of Islamic and Traditional commercial banks in Malaysia*", International Journal of Islamic and Middle Eastern Finance and Management, Vol. 5 Iss: 3, pp.241-263.

[9] Ahmed, U. (2011). CHALLENGES FACING ISLAMIC BANKING. *Economic Review (05318955)*, *42*(2), 18-20

[10] Alam, N. (2013),"*Impact of banking regulation on risk and efficiency in Islamic banking*", Journal of Financial Reporting and Accounting, Vol. 11 Iss 1 pp. 29-50.

[11] Al-Janabi, M.A.M. (2012). *Proactive risk management in emerging and Islamic Financialmarkets*. Banking and Finance International Conference (BFIC): Beirut.

[12] Anwar, H., & Millar, R. (2008). *Islamic Finance: A Guide for International Business and Investment*. London: GMB Pub

[13] Ariff.M, Iqbal, M., & Mohamed, S. (2012). *The Islamic debt market for sukuk securities: The theory and practice of profit sharing investment*. Cheltenham, U.K: Edward Elgar.

[14] Arouri et al. (2014). 'Emerging Markets and The Global Economy: A Handbook'. El Sevier Inc.: San Diego, USA.

[15] Awdeh, A. (2012). *Banking Sector Development and Economic Growth in Lebanon*. International Research Journal of Finance and Economics, 54-62.

[16] Ayub, M. (2007). *Understanding Islamic Finance*. Hoboken, NJ: Wiley

[17] Bader, M.K., et al. (2007), "*Efficiency of Islamic banks: international evidence*", paper presented in the 14th Annual Global Finance Conference GFC, Melbourne, April 1-4.

[18] Baig, K. (2013). Challenges to the growth of the Islamic finance market'. The Express Tribune: NewYork Times. Retrieved from http://tribune.com.pk/story/538576/challenges-to-the-growth-of-the-islamic-finance-market/

[19] Balala, M. (2011). *Islamic Finance and Law : Theory and Practice in a Globalized World*. London: I.B.Tauris

[20] Bashir, A. (2000), "Determinants of profitability and rates of return margins in Islamic banks: some evidence from the Middle East" Grambling State University Mimeo.

[21] Bashir, A. (2001). Assessing the Performance of Islamic Banks: Some Evidence from the Middle East. Topics in Middle Eastern and North African Economies. Unpublished paper. Proceedings of the Middle East Economic Association.

[22] Barua, M. (2013) "Efficiency and productivity of banking sector: A critical analysis of literature and design of conceptual model", Qualitative Research in Financial Markets, Vol. 5 Iss: 2, pp.195-224.

[23] Bellalah, M & Masood, O. (2013). 'Islamic Banking and Finance'. Cambridge Scholars Publishing. UK. Retrieved from http://www.cambridgescholars.com/download/sample/59242.

[24] Berger, A & Humphrey, D (1997*). 'Efficiency of Financial Institutionas: International Survey and Directions for Future Research'*. European Journal of Operational Research. Vol 98, 175-212.

[25] Cihak,M & Hesse, H. (2008). 'Islamic Banks and Financial Stability: An Empirical Analysis'. International Monetary Fund.

[26] Ernest & Young (2015).'World Islamic Banking Competitiveness Report 2014-15'. Retrieved from http://www.ey.com/EM/en/Industries/Financial-Services/Banking---Capital-Markets/EY-world-islamic-banking-competitiveness-report-2014-15.

[27] Fries, S & Taci, A. (2004). 'Cost Efficiency of Banks in Transition: Evidence from 289 Banks in 15 Post-communist Countries'. European Bank for Reconstruction and Development.

[28] Global Finance (2013).'World's Best Islamic Financial Institutions'. Best Banks and Financial Rankings.

[29] Golin, J. (2001). The Bank Credit Analysis Handbook: A Guide for Analysts, Bankers and Investors. John Wiley & Sons (Asia) Pre Ltd.

[30] Gul, S., Irshad, F., & Zaman, K., (2011). Factors Affecting Bank Profitability in Pakistan. The *Romanian Economic Journal* 39.

[31] Hamim S., et al. (2008),"*Efficiency and competition ofIslamic banking in Malaysia*", Humanomics, Vol. 24 Iss 1 pp. 28-48.

[32] Hanif, M. ,et al. (2012).' *Comparative Performance Study of Traditional and Islamic Banking in Pakistan*'.International Research Journal of Finance and Economics, Issue 83.

[33] Hassan, M. K & Lewis, M. (2007). 'Handbook of Islamic Banking'. Edward Elgar Publishing Limited: Massachusetts, USA.

[34] Hassan, M. K. (2005), '*The Cost, Profit and X-Efficiency of Islamic Banks*'. Economic Research Forum", 12th Annual Conference, Cairo, Egypt.

[35] Hay'at Markaz Qatar, l. (2010). *Islamic Finance : Instruments and Markets*. London: Bloomsbury Information Ltd.

[36] Hess,K & Francis,G. (2004) "Cost income ratio benchmarking in banking: a case study", Benchmarking: An International Journal, Vol. 11 Iss: 3, pp.303-319.

[37] Ijaz, M. (2012).'Islamic Modes of Finance'. Retrieved from http://pu.edu.pk/images/journal/szic/pdf_files/4-%20M.%20Ijaz%20islamic%20%20modes%20of%20financing_june2012.pdf

[38] Imane, Y. (2014). 'Risk Management Practices and Financial Performance in Jordan: Empirical Evidence from Islamic Banks'. Setif University

[39] International Monetary Fund. (2015).. 'Islamic Finance: Opportunities, Challenges, and Policy Options'. Retrieved from http://www.imf.org/external/pubs/ft/sdn/2015/sdn1505.pdf

[40] Iqbal, Z. (2011).' Challenges Facing Islamic Financial Industry'. Journal of Islamic Economics, Banking and Finance. Retrieved from http://www.researchgate.net/profile/Zamir_Iqbal/publication/237755364_Challenges_Facing_Islamic_Financial_Industry/links/0c9605375d90372978000000.pdf.

[41] Islam, K, Alam, I & Hossain, S. (2014). 'Examination of Profitability between Islamic Banks and Traditional Banks in Bangladesh:A Comparative Study'. Macrothink Institute

[42] Islamic Institute of Islamic Finance Incorporated. (2011). 'An Introduction to Islamic Finance'. Retrieved from http://www.cimaglobal.com/Documents/Islamic%20finance/2011/Guides/Introduction.pdf.

[43] Ismail, F, Abd. Majid, M, Ab. Rahim, R, (2013) "*Efficiency of Islamic and Traditional banks in Malaysia*", Journal of Financial Reporting and Accounting, Vol. 11 Iss: 1, pp.92-107.

[44] Johnes, J, et al. (2014). '*Efficiency in Islamic and Traditional Banks: Evidence from the Gulf Cooperation Council Countries*' (January 20, 2014). Lancaster University. United Kingdom.

[45] Johnes, J., M. Izzeldin and V. Pappas. (2009). '*Efficiency in Islamic and Traditional banks: A Comparison based on Financial Ratios and Data Envelopment Analysis*'. Retrieved from http://ssrn.com/abstract=2411974.

[46] Kahf, M., & Khan, T. (2007). *Principles of Islamic Finance*. Jeddah: Islamic Research and Training Institute- Islamic Development Bank.

[47] Kammer, A. et al. (2015). 'Islamic Finance: Opportunities, Challenges, and Policy Options'. International Monetary Fund. April 2015.

[48] Keller, G. (2012).'Managerial Statistics'. Cengage Learning. 9th ed.

[49] Kettell, B. (2011). *Introduction to Islamic Banking and Finance*. Wiley Finance: United Kingdom

[50] Khamis, M. & Senhadji, A. (2010). Impact of the global financial crisis on the Gulf ooperation Council countries and challenges ahead. Washington D.C: International Monetary Fund Publication.

[51] Khan,W, et al (2014). 'Impacts of Inflationary Trends on Banks' Performance (Large Bank Segment) in Pakistan'. International Journal of Accounting and Financial Reporting. Vol.4 No.1.

[52] Kumbhakar, S.C. and Lovell, C.A.K. (2003), '*Stochastic Frontier Analysis*'. Cambridge UniversityPress, Cambridge.

[53] Lartey, v. et al. (2013). The Relationship Between Net Interest Margin and Return on Assets of Listed Banks in Ghana. Research Journal of Finance & Accounting.Vol 4 Issue 16, p.73.

[54] Mankiw, G., & Rashwan, M. (2012). *Principles of Economics Middle East Ed.* Hampshire: Cangage Learning.

[55] Manthos D. Delis, Nikolaos I. Papanikolaou, (2009), "Determinants of bank efficiency: evidence from a semi-parametric methodology", Managerial Finance, Vol. 35 Iss: 3 pp. 260-275.

[56] Mashayekhi, A, et al. (2007). '*Islamic Finance in the UK: Regulation and Challenges*'. FSA.

[57] Merchant, I.P. (2012). Empirical Study of Islamic Banks Versus Conventional Banks of GCC. *Global Journal of Management and Business Research, 12* (20).

[58] Mirakhor, A. (2011), An Introduction to Islamic Finance: Theory and Practice,2nd ed.Singapore: Wiley Finance.

[59] Moin, M. (2013). 'Financial Performance of Islamic Banking and Traditional Banking in Pakistan: A Comparative Study'. International Journal of Innovative and Applied Finance.

[60] Mokhtar, H et al. (2008),*"Efficiency and competition of Islamic banking in Malaysia"*, Humanomics, Vol. 24 Iss 1 pp. 28-48.

[61] Momeneen, W., Tahir, A., Tariq, M., Hanif, M. (2012). Comparative Performance Study of Conventional and Islamic Banking in Pakistan. *International Research Journal of Finance and Economics, 83*. ISSN 1450-2887. Retrieved from EuroJournals

[62] Mukherjee et al., (2001). '*Productivity growth in large US commercial banks: The initial post-deregulation experience*'. Journal of Banking and Finance, 25 (2001), pp. 913-939.

[63] Mukhopadhyay, J. (2012). '*Competition in markets promote economic efficiency*'. Institute for Financial Management and Research. Chennai. Retrieved from http://www.cci.gov.in/May2011/Advocacy/essay2012/jyoti.pdf.

[64] Murphy, A. (2008). An Analysis of the Financial Crisis of 2008: Causes and Solutions (2008). Working paper series. School of Business Administration, Oakland University. Available at SSRN: http://ssrn.com/abstract=1295344.

[65] Naceur, S.B., Ben-Khedhiri, H., and Casu, B., (2009), "*What drives the efficiency of selected MENA banks? A meta-frontier analysis*", Working Paper No. 03/09, Centre for Banking Research, Cass Business School, City University London.

[66] Olson, D., & Zoubi, T. A. (2008). Using accounting ratios to distinguish between Islamic and Traditional banks in the GCC region. *International Journal Of Accounting, 43*45-65.

[67] Ongore, V.O. & Kusa, G.B. (2013). Determinants of Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Financial Issues*, Vol. 3, No. 1, 2013, pp.237-252.

[68] Onakoya, A & Onakoya, A. (2013). 'The performance of Traditional and Islamic banks in the United Kingdom: A comparative analysis.' Retrieved from https://www.academia.edu/3180579/The_Performance_of_Traditional_and_Islamic_Banks_in_the_United_Kingdom_A_Comparative_Analysis.

[69] Paul et al. (2013). 'Profitabbility and Liquidity of Traditional Banking and Islamic Banking in Bangladesh: A Comparative Study'. European Journal of Business and Management. Vol 5. No. 24.

[70] Perry, P., 1992. Do banks gain or lose from inflation? Journal of Retail Banking 14, 25-30

[71] Raphael, G. (2013). 'Bank-specific and Macroeconomic Determinants of Bank Efficiency in Tanzania: A Two Stage Analysis'. European Journal of Business and Management Vol.5 No.2.

[72] Rashwan, M,H. (2012*). How did listed Islamic and Traditional Banks Perform: pre and post 2008 Financial Crisis*? Journal of Applied Finance and Banking, 2 (2). p. 149-175.

[73] Reuters. (2011). 'Islamic Interbank Benchmark Rate: Pulse of Islamic Capital Markets'. Retrieved from http://thomsonreuters.com/content/dam/openweb/documents/pdf/tr-com-financial/fact-sheet/iibr.pdf.

[74] Rose, P. (2013). 'Commercial Banking Management'. Boston: McGraw Hill.

[75] Rosman, R., Wahab, N. A., & Zainol, Z. (2014). Efficiency of Islamic banks during the financial crisis: An analysis of Middle Eastern and Asian countries. *Pacific-Basin Finance Journal, 28*(Special Issue on Islamic Banking and Finance), 76-90.

[76] Saeed, A. (2008). '*Basic principles of Islamic banking: An overview*'. University of Melbourne.

[77] Samad, A. (2004). Bahrain Commercial Bank's Performance during 1994-2001.Credit and Financial Management Review 10(1) pp 33-40.

[78] Schumpeter, J. A., (1911), "*The theory of economic development*", Harvard University PressCambridge, MA.

[79] Sehrish, S., Saleem, F., Yasir, M., Shehzad, F.,& Ahmed, K. (2012). Financial performance analysis of Islamic banks and conventional banks in Pakistan: A comparative study. Interdisciplinary Journal of Contemporary Research, 4, 186-200.

[80] Shaikh, S. A. (2014). Analysis of Challenges and Opportunities in Islamic Banking. *Journal of Islamic Banking & Finance, 31*(3), 61.

[81] Shen, Z, Liao, H & Jones,T. (2008). 'Cost Efficiency Analysis in Banking Industries of Ten Asian Countries and Regions'. Loughborough University.

[82] Siddiqi, N.M. (2012). The Comparative Advantages of Islamic Banking and Finance. *Massachusetts. Center for Middle Eastern Studies: Harvard University Forum on Islamic Finance.* p. 183-188.

[83] Siraj,K & Pillai, P. Comparative Study on Performance of Islamic Banks and Conventional Banks in GCC Region. Journal of Applied Finance and Banking 2 (3), 123.

[84] Smaoui, H. & Ben Salah, I. (2011), "Profitability of Islamic Banks in the GCC Region", *King Fahd University of Petroleum and Minerals, Working Paper*, Saudi Arabia.

[85] Srairi, S.A. (2010). '*Cost and Profit Efficiency of Traditional and Islamic Banks in GCC Countries'.* Journal of Productivity Analysis, 34 (1): 45-62.

[86] Sufian, F. & Chong, R.R. (2008). Determinants of Bank Profitability in a Developing Economy: Empirical Evidence from Philippines. Asian Academy of Management Journal of Accounting and Finance. [Online] 4(2) p.91-112.

[87] Sufian, F. (2007). The Efficiency of Islamic Banking Industry in Malaysia: Foreign vs Domestic Banks. Humanomics,23 (3), 174-192.

[88] Sufian, F., & Habibullah, M. S. 2009. Asian Financial Crisis and the Evolution of Korean Banks Efficiency: Perspectives on East Asian Economies and Industries, 38 (4): 335-369.

[89] Sundararajan, V., Ahmed, J., & Kohli, H. S. (2011). *Islamic finance*. New Delhi: SAGE.

[90] Tahir, M & Haron, S. (2010). ' *Cost and profit efficiency of Islamic banks: international evidence using the stochastic frontier approach*', Banks and Bank Systems, Volume 5 (4), pp. 78 – 83.

[91] Tarawneh, M. (2006), A comparison of financial performance in the Banking sector: Some evidence from omani commercial Banks. International Research Journal of Finance and Economics, 3, 101-112.

[92] Thanassoulis, E., 2001, *Introduction to the theory and application of Data Envelopment Analysis, A foundation text with integrated software.*(Norwell,Massachussetts: Kluwer Academic Publishers.

[93] The Economist. (2013).' The origins of the financial crisis'. Retrieved from http://www.economist.com/news/schoolsbrief/21584534-effects-financial-crisis-are-still-being-felt-five-years-article.

[94] Tripe, D. (2013). 'Cost to Income Ratios in Banking'. Center for Banking Studies: Massey University.

[95] Tripe, D.(2009). Cost To Income Ratios In Australian Banking, Centre For Banking Studies,Massey University.

[96] Vincent, J. (2014). 'Historical, Religious and Scholastic Prohibition of Usury: The Common Origins of Western and Islamic Financial Practices'. Law School Student Scholarship.Paper 600.

[97] Viverita, D, (2010). '*Performance Analysis of Indonesian Islamic and Traditional Banks'*. Retrieved from http://ssrn.com/abstract=1868938.

[98] Vogel, F. & Hayes, S. (1998). *Islamic Law & Finance: Religjon, Risk and Return*. Kluwer International School. Massachatues-USA pp-90.

[99] Warde, I. (2010). *Islamic Finance in the Global Economy.* Edinburgh: Edinburgh University Press.

[100] Wasiuzzaman,S & Tarmizi,H. (2010). 'Profitability of Islamic Banks in Malaysia: An Empirical Analysis'. Journal of Islamic Economics, Banking and Finance, Vol.6 No.4.

[101] Yahya, M, Muhammad, J, Abdul Hadi, A. (2012) "*A comparative study on the level of efficiency between Islamic and Traditional banking systems in Malaysia*", International Journal of Islamic and Middle Eastern Finance and Management, Vol. 5 Iss: 1, pp.48-62.

[102] Yoluker, M. (2011). 'Current Challenges of Islamic Finance'. Islamic Finance News. Retrieved from http://www.kbhkaanuun.com/uploads/News/14.pdf.

[103] Yueh, L. (2014, July 18). '*Islamic Banking: growing fast but can it be more than a niche market*?'. BBC News Business. Retrieved from http://www.bbc.com/news/business-28365639

[104] Zeitun, R. (2012). 'Determinants of Islamic and Traditional Banks Performance in GCC Countries using Panel Data Analysis'. Global Economy and Finance Journal Vol.5 No.1 Pp. 53-72