

# Islamic vs Conventional Microfinance Institutions: Performance analysis in MENA countries

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## ABSTRACT

*Microfinance has been identified as an important policy instrument that allows greater financial and social independence for women and poor by facilitating access to financial services for the poorest and destitute. Microfinance institutions (MFIs) have mostly a high concentration of women beneficiaries and aim at alleviation of poverty in all its forms. Accordingly, the principal purpose of microfinance institutions is to be social performing by reducing poverty. However, they have to reconcile this objective with financial performance by trying to be profitable and sustainable. On other side, Islamic Microfinance has growing progressively in the world, particularly in poor countries, as credible alternative which allows poor populations to have access to basic financial services at low cost. The integration of Islamic finance concepts to microfinance was one of the valuable reasons in attracting poor to get advantage of these services. Whereas the complexity of these methods in microfinance and lack of transparency in profit distribution, there are some challenges about their efficiency. It is therefore of utmost interest to consider if the financial performance of Islamic microfinance institutions will be negatively correlated with the depth of outreach. The aim of this paper is to examine the performance of Islamic microfinance institutions in comparison with conventional institutions. This study focuses analysis on the MENA region, where a large proportion of the poor are practicing Muslims and are thus unable to take advantage of traditional microfinance contracts which are incompatible with Sharia'. Using a non parametric data envelopment analysis (DEA) to estimate the efficiency of the microfinance institutions, our study provides the empirical evidence from Islamic and conventional microfinance institutions in MENA region.*

**Key Words:** Microfinance Institutions, Islamic finance, MENA region, Poverty, financial performance, social performance.

**JEL Classification:** G21, D21, I32, L25.

## 1. Introduction

The provision of financial services to the poor stimulates local economies by increasing household income and therefore creating demand for other goods and services. However, the poorest might not participate to the development process because they are excluded from the financial system. With no access to financial services, these households find difficulties to build assets or to finance their children's education. Therefore, financial exclusion binds them into vicious circle of poverty (Obaidullah &Khan, 2008). Conversely, microfinance implies provision of financial services to poor and low-income people who are expelled from formal financial systems. Access to services such as, credit, savings, venture capital and insurance, is provided to a micro-scale enabling participation of those with severely limited financial means. The provision of financial services to the low income people helps thus, to reduce their vulnerability by increasing their incomes and to improve economic security.

Microfinance has been identified as an important tool in supporting and strengthening the economy at the bottom of the socio-economic pyramid by facilitating access to financial services for the poorest and destitute. Microfinance generally refers to the provision of a broad array of financial services including, credit, payments, savings, and insurance tailored to meet the particular needs of low income households and their

microenterprises. It also helps them providing a better life condition by increasing the household revenues and job creation for micro-entrepreneurs. The principal purpose of Microfinance institutions (MFI) is thus to be social performing by reducing poverty. However, they have to reconcile this objective with financial performance by trying to be profitable and sustainable. Microfinance institutions have mostly a high concentration of women beneficiaries and aim at alleviation of poverty in all its forms. Accordingly, Microfinance has been recognized worldwide as an important policy instrument which allows for greater financial and social independence for women.

On other side, Islamic Microfinance has been progressively growing in the world, particularly in poor countries, as credible alternative which allows poor populations an access to basic financial services at low cost. Islamic Microfinance is considered as an efficient instrument to encourage entrepreneurship and facilitate the creation of Small to Medium Enterprises (Ahmed, 2002). Islamic microfinance represents the meeting of two rapidly growing industries: microfinance and Islamic finance. Hence, it has the potential to not only respond to the unmet demand but also to combine the Islamic social principles of caring for the disadvantaged with microfinance's power to provide financial access to the poor. It has then the potential of providing financial access to millions of poor Muslim who currently refuse microfinance products that do not comply with Islamic law.

According to Honohon (2008) about 72% of people living in Muslim majority countries do not use formal financial services. Even when financial services are available, some people don't use them because they are incompatible with principals set forth in Islamic law. In recent years, some microfinance institutions have stepped in to service low income Muslim clients who demand products consistent with Islamic financial principals which lead to the emergence of Islamic microfinance as a new market niche.

The supply of Islamic microfinance products is actually concentrated in a few countries; the top three are Indonesia, Bangladesh, and Afghanistan where the demand is high, accounting for 80 percent of global outreach. Nevertheless, demand for Islamic microfinance products is strong. While conventional microfinance institutions have expanded their operations in the last two decades, poverty-focused microfinance based on Islamic principles is also growing rapidly. According to a global survey conducted by the Consultative Group to Assist the Poor (CGAP) in 2007, Islamic microfinance has a total estimated global outreach of only 380,000 customers served by 126 institutions in 14 countries and accounts for only an estimated one-half of one percent of total microfinance outreach.) These findings corroborate with recent data in 2011 showing that Islamic MFIs have stagnated below 10.000 thousand active borrowers whereas conventional MFIs are reaching hundreds of thousands of active borrowers<sup>1</sup>. According to the 2013 CGAP focus note on Islamic Microfinance, the overall supply of Islamic products is still quite small relative to the conventional microfinance sector in spite of a twofold increase in the number of providers and in the number of poor client using Sharia-compliant products. Based on CGAP surveys in 2011, customers using Sharia-compliant products represent less than 1 percent of total microfinance outreach.

With the rapid growth of Islamic banking market studies have investigated the performance of Islamic banks (Bashir, 2001) and have compared it to conventional banks (Abdul-Majid et al.2008; Beck et al., 2013), however, there is still a gap in empirical studies analyzing the performance of Islamic MFIs. The purpose of this paper is to fill this gap by examining the performance of Islamic microfinance institutions compared to their conventional counterpart.

The aim of our study is to provide then an inter-group comparison which would allows us to evaluate differences in performance between Islamic and conventional microfinance institutions. We will focus in the MENA region, where a large proportion of the poor are practicing Muslims, and are thus unable to take advantage of traditional microfinance contracts which are incompatible with principals of *Sharia*'. The integration of Islamic finance concepts into microfinance sector was one of the valuable reasons in attracting poor to get advantage of these services. Whereas, there are some challenges about the efficiency of these methods in microfinance, because of their complexity and lack of transparency in profit distribution which makes the borrower confused and the cost of transactions and administrations very high. It is therefore of utmost interest to examine the comparative

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<sup>1</sup> Mohammed Khaled, "Why Has Islamic Microfinance Not Reached Scale Yet?", (CGAP, 2011)

performance of Islamic and conventional microfinance institutions in MENA region. Using a non parametric data envelopment analysis (DEA), we will estimate the efficiency of the microfinance institutions within this region.

This paper is organized as follows: section 2 introduces structural differences between conventional and Islamic MFI. Section 3 provides a literature review along with methodology, tools and data used in this study. Section 4 contains empirical results about the performance of Microfinance institutions in MENA region in order to prospect if there is difference for Islamic microfinance and section 5 concludes.

## 2. Islamic Microfinance

Microfinance has been identified as an important tool in increasing the productivity of the poor and in enhancing economic development. Microfinance means “program which extends small loans to very poor people for self employment projects which generate income in allowing them to take care of themselves and their families” (Microcredit Summit, 1997). However, large proportions of the poor are practicing Muslims, and are thus unable to take advantage of traditional microfinance contracts which involve the payment of interest (El-Kommi&Croson, 2012). According to Abdul Rahman (2007), Islamic Microfinance has an important role for promoting socio-economic development of the poor and small entrepreneurs without charging interest (*riba*). Given the moral and ethical attributes of Islamic financing schemes, micro entrepreneurs will be motivated to succeed.

### 2.1 Principles of Microfinance

The first experiment of microfinance was in Bangladesh, it started in 1976 after the wide-spread famine in 1974. Then, the idea of microfinance has spread globally in poor countries (Africa, Latin America, and Asia) as well as in richer economies like Norway, the United States, and England.

Microfinance aims to finance micro entrepreneurs and poor by small loans. The terms and conditions of these loans are generally flexible and easy to understand. Moreover, loans are given without collateral or guarantor and are generally based on trust. Given the attributes of microfinance, it is considered as an alternative for micro entrepreneurs who are not eligible to receive loans from commercial banks<sup>2</sup>. Therefore, potential borrower needs only to join the recipient group of microfinance in order to obtain loans among group members. Then, new small loans will be given after the previous loans are repaid.

The basic principles of microfinance as expounded by the founder of Grameen Bank of Bangladesh (Dr. Muhamad Yunus) is that credit forms a fundamental human right. The main assignment of microfinance is, therefore, in assisting poor people to become economically independent given the assumption that their expertise is underutilized. However, charity is considered as non effective process in eradicating poverty which will lead to dependency and lack of initiative among the poor. In this light, many elements of microfinance could be considered consistent with the broader goals of Islamic finance. So, it is question about the differences between microfinance and Islamic microfinance that will affect their performance.

### 2.2 Islamic Microfinance: Which differences?

Islamic microfinance represents “the confluence of two rapidly growing sectors: microfinance and Islamic finance” (CGAP, 2013). As Islamic finance sector, refers to financial system based on *Sharia*. The strict prohibition of paying or receiving any fixed, interest (*riba*) is the most widely known feature of this financial system. Therefore, Islamic microfinance institutions should operate on the basis of profit. In the vein of Islamic banks, these institutions can earn profits in three areas: trading, leasing and by direct financing in Profit Loss Sharing (PLS) contracts (Al-Omar & Abdel-Haq, 1996).

Supporters of Islamic alternatives to conventional microfinance argue that the provision of equity financing via products which are conform to Islamic religious law (*Sharia*), will promote the social condition of local Muslim communities (Abdul Rahman, 2007). Using a sample of three Islamic MFIs operating in Bangladesh, Ahmed

<sup>2</sup> The loan is provided for short term financing and repayments can be made on a weekly or longer basis. The procedures of given loans are normally fast and easy. There is possibility to give additional capital after the full settlement of the previous loan (Abdul Rahman, 2007)

(2002) found that Islamic MFIs have performed better than a well-established conventional microfinance institution.

*Zakah* and *Sadaqah* as instruments of charity occupy a central position in the Islamic scheme of poverty alleviation. Rules of *Sharia'* are fairly clear and elaborate in defining the nature of who are liable to pay *zakah* and who can benefit from *zakah*. The first and principal category of potential beneficiaries is the poor and the destitute (Obaidullah&Khan, 2008). Therefore, Islamic microfinance institutions should be able to mobilize resources, either through accepting savings deposits or obtaining funds. This commercial approach entails charging and sharing of profits and is quite consistent with Islamic *Sharia'*. Besides the provision of alternatives to exploitable lending via *mudabah* and *musharakah*, Islamic Microfinance can allow the integration of the poorest by savings schemes via *wadiah* and *mudarabah* deposits, money transfers through *zakat* and *sadaqah*, and insurance via *takaful* concept.

In total, there are several characteristics that distinguish conventional microfinance from Islamic Microfinance (Ahmed, 2002). Table 1 summarizes possible differences between conventional and Islamic microfinance institutions regarding their characteristics.

**Table 1. Comparison between Conventional and Islamic Microfinance Institutions**

Items	Conventional MFI	Islamic MFI
Liabilities (Source of Fund)	External Funds, Saving of client	External Funds, Saving of Clients, Islamic Charitable Sources ( <i>Zakat</i> , <i>Waqf</i> )
Asset (Mode of Financing)	Interest-Based	Islamic Financial Instrument
Funds Transfer	Cash Given	Goods Transferred
Deduction at Inception of Contract	Part of Funds deducted as Inception	No deduction at Inception
Target Group	Women	Family
Work incentive of employees	Monetary	Monetary and Religious
Dealing with default	Group/center pressure and threat	Group center, Spouse Guarantee and Islamic Ethic
Social Development Program	Secular, behavioral, ethical and social development	Religious (includes behavior, ethics and social)

AbdulRahman (2007)

While, both of them mobilize external funds and savings as their source of fund, Islamic charity such as *zakat* and *waqf* are specific source for funding Islamic microfinance. The second specificity of Islamic microfinance concerns modes of financing that should eliminate interest in their operation whereas conventional microfinance can adapt interest-based financing. There is also a great potential for Islamic microfinance to capitalize on social services by using *zakat* to fulfill the basic needs and increase the participation of the poor. Therefore, Islamic microfinance institutions have an array of instruments as possible modes of Islamic financing to explore in their operations.

The third feature concerns funds transfer by microfinance institutions. In conventional microfinance, the institution can directly give cash to their client as the financing. While Islamic financial services providers are not allowed to give cash to their clients as loan is prohibited in Islam. Moreover, Islamic microfinance may use similar technique of conventional institutions (group lending as a way to alleviate risk in their operation) and they also developed Islamic ethical principles to ensure their clients paying regularly.

The overall desired impact of conventional microfinance has been questioned given the critics addressed to the financing process of microfinance institutions (Abdul Rahman, 2007). Among these critics, there is high interest rate (up to 30%) charged to poor receivers in order to make financial gains for these institutions. On the other hand, Islamic microfinance makes use of Islamic financial instruments which are based on Profit Loss Sharing schemes rather than loan. While conventional microfinance institutions focused mainly in women as their client, advocates of Islamic microfinance argue that Islamic MFI should be extended to the whole family as well (Ahmed, 2002).

### 2.3. Sharia-compliant instruments of microfinance

Islamic financial system provides an array of instruments and microfinance products which are conform to norms in Islamic finance such as the prohibition of *riba*, *gharar* and *darar*. According to CGAP (2013), Murabaha and Qard-Hassan loans are the main Islamic financing products for the poor.

- **Micro-savings:**  
Poor people want to save and their savings will be considered as investments for Islamic MFIs. They make investments of deposits which are consistent with the principles of Islamic religious law (Sharia). The profits and losses will be shared between the MFI and the customer if the product of deposit is *mudaraba*. The deposits are also invested on *musharaka* or *takaful*.
- **Micro-credit:**  
Micro-credit is considered as an alternative to micro-credit offered by conventional microfinance institutions (MFIs). Contrary to this credit that violates the fundamental prohibition of *riba*, Islamic MFI allows customers the acquisition of assets that are required to their productive activity by giving them for rent. To finance these acquisitions, MFIs use a variety of Sharia -compliant mechanisms, such as, qard hasan, murabaha with bai-bithaman-ajil, ijara, bai-salam etc. All these modes create debt for the customer by paying the price of assets with gross margin.
- **Micro-lease :**  
Microfinance institution tolerates its client using its assets. Contrary to conventional lease, the risks are very high to the institution which takes on the responsibility all damages involuntary caused to its customer. The idea is to avoid that leasehold is considered as a sale transaction with interests. Besides, the modalities of leasing contract are defined in advance.
- **Micro-takaful:**  
For protection against unpredicted risks by borrowers, micro-insurance would take the form of micro-*takaful* based on mutual guarantee. The contribution of each member to insurance fund helps them to improve prevention to risks and strengthen the security of borrowers. This fund compensates borrowers who face emergencies—such as fire, flood, agricultural losses, and death—that affect their businesses. Premiums will be invested in order to be different to interest mechanism.

Given these differences between Islamic and conventional MFIs regarding the sources of funds and the instruments of financing, we examine if there is difference on performance, particularly in terms of technical efficiency.

While several authors have explored the relative efficiency of conventional MFIs in MENA region, there aren't investigations on the performance of Islamic MFIs using a non-parametric method. To our knowledge, Ahmed (2002) is the only study that provides a comparative analysis of Conventional MFIs and Islamic MFIs with empirical evidence on three Islamic MFIs operating in Bangladesh. Ahmed (2002) suggests that the ethical attributes of Islamic financing schemes can justify the better performance of Islamic MFIs comparing to the well-established conventional microfinance institution in Bangladesh. According to him, the Islamic teachings increase solidarity among beneficiaries and thus improve the quality of social collateral. Moreover, the incentive of employees in an Islamic microfinance institution to work hard for the improvement of poor lives can enlighten the better performance of these institutions than conventional MFIs (Ahmed, 2002).

The purpose of this paper is to gauge the relative performance of Islamic microfinance institutions compared to conventional institutions in Arab countries during the recent crisis. Our study provides an empirical evidence of the performance comparison between Islamic and conventional Microfinance Institutions using an array of indicators measuring financial performance and outreach.

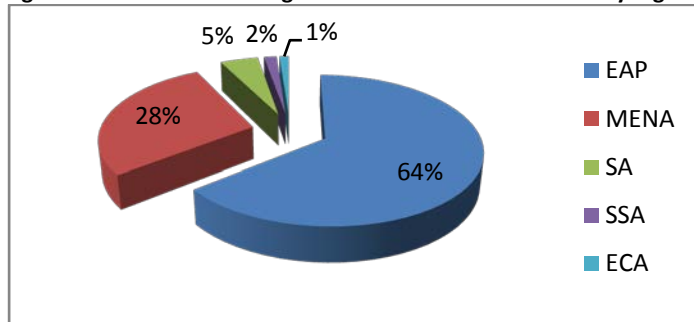
## 3. Data and Methodology

### 3.1 Data of MFIs:

According to the 2013 CGAP focus note, there are 255 financial service providers offering Sharia-compliant microfinance products around the world. Approximately 28 percent of these providers are concentrated in the Middle East and North Africa which is one of the two regions representing almost 92 percent of all providers (See

Figure 1). Consequently, we focus our analysis on MENA region using the data for the years between 2005 and 2010. This study provides an empirical analysis of the efficiency of microfinance institution in this region

**Figure1. Institutions Offering Islamic Microfinance Products by region**



Note: Note: EAP = East Asia and Pacific; ECA = Europe and Central Asia; MENA = Middle East and North Africa; SA = South Asia; SSA = Sub-Saharan Africa. Data came from CGAP Focus Note 84, March 2013.

It's useful to remind that the objective of this paper is to examine the performance of Islamic microfinance institutions compared to conventional MFIs during the period 2005-2010. The methodology used to analyze the efficiency is the non-parametric data envelopment analysis (DEA).

Data came from the Microfinance Information Exchange (MIX) database which is the premier source for objective, qualified and relevant microfinance performance data and analysis. The base provides actually access to financial and social performance information covering approximately 2,000 MFIs around the world.

Our sample is composed of an unbalanced data of 65 Arab MFI (located in Sudan, Palestine, Yemen, Iraq, Jordan, Lebanon, Syria, Egypt, Morocco and Tunisia) over the period 2005-2010. Our sample is composed of two groups: conventional and Islamic MFI. For the second group both fully fledged Islamic Microfinance institutions as well as conventional MFIs with Islamic windows are included.

Several authors have explored the relative efficiency of conventional MFIs, such as Ben Soltane (2008) and Adair and Berguiga (2010) for institutions in Middle East and North Africa region while others focused on Sharia-Compliant Financial institutions such as CGAP (2008; 2013). Unlike previous papers, our study gauge the relative performance of Islamic microfinance institutions compared to conventional institutions in Arab countries during the recent crisis. Hence, this paper provides empirical evidence on the efficiency of microfinance institutions with distinctions of those providing *Sharia-Compliant* financial products in this region.

Approximately 78% of institutions are conventional microfinance institutions which are in greater part nongovernment organizations (NGO) in our sample. Based on MIX data, there are an estimated 14 financial service providers offering Sharia-compliant microfinance products, representing 22% of all providers in MENA region. While the types of institutions offering Sharia-compliant microfinance services vary, a majority (in terms of absolute number) are nonbank financial institutions and NGO.

**Table 2 Microfinance institutions by institution Type in MENA region**

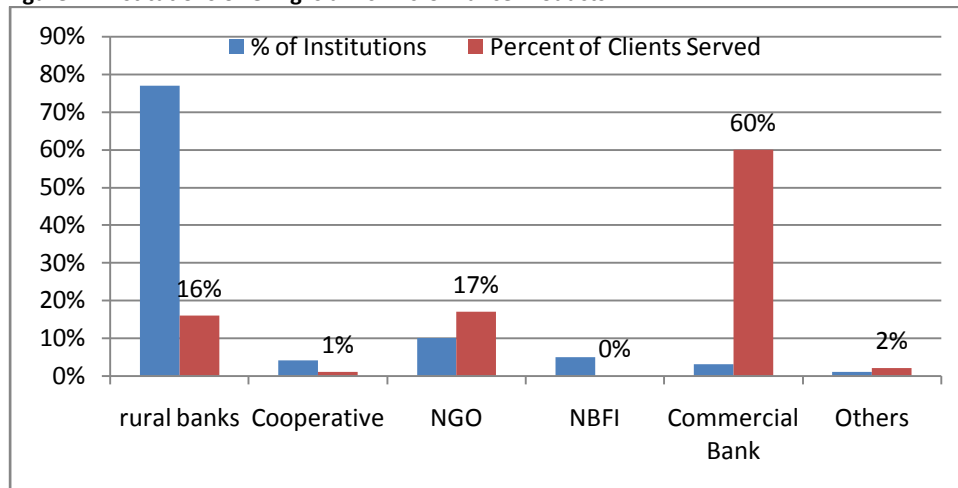
Type of Institutions	Number of IMFs		% of Institutions	
	Conventional	Islamic	Conventional	Islamic
NGO	40	6	78%	43%
NBFI	7	7	14%	50%
Commercial Bank	1	1	2%	7%
Other	3	0	6%	0%
<b>TOTAL</b>	<b>51</b>	<b>14</b>	<b>78%</b>	<b>22%</b>

Source Authors' calculations based on Microfinance Information Exchange (MIX) data

Note: NGOs = nongovernment organizations; NBFIs = nonbank financial institutions

Based on the 2013 CGAP survey, the majority of institutions offering Sharia-compliant microfinance services, in terms of absolute number, are rural banks. However, commercial banks are the largest providers of Sharia-compliant financial services when measured by the number of clients served. Regarding Commercial banks serve 60 percent of the 1.28 million Islamic microfinance clients served, whereas rural banks serve only 16 percent (see Figure 2).

**Figure 2: Institutions offering Islamic Microfinance Products**



Note: NGOs = nongovernment organizations; NBFs = nonbank financial institutions

### 3.2 Inputs and Outputs Specifications

The selection of inputs and outputs to incorporate in the model is one of the most important stages in the DEA assessment. There is no restrictive condition in the number of inputs and outputs to use in the DEA model. However, we have to keep in mind the curse of dimensionality (low number of DMUs relative to number of input-output variables) often present in nonparametric estimation. Banker et al. (1989) suggest a rough rule of thumb. Let  $m$  be the number of inputs and  $s$  be the number of outputs used in the analysis, then the sample size  $n$  should satisfy  $n \geq \max\{m \times s, 3(m + s)\}$ .

Each MFI has a "double bottom line": social and financial objectives. Besides their financial objective MFIs also have a developmental or social objective.

While struggling to achieve rapid growth, serve more poor clients, improve portfolio quality, and become financially sustainable, MFIs with a double bottom line have also to ensure they are meeting their development goals (women's empowerment, rural outreach, and social responsibility to clients). To assess the performance of MFI, we should then take into account these two objectives.

Our choice of input and output measures are based on similar research using DEA model (among others, Gutiérrez-Nieto et al. 2007, 2009; B. Ben Soltan, 2008, Corneé, 2007 and Haq and al., 2010, Ahmed, 2002, Adair and Berguiga, 2010) and the availability of data for Arab MFIs.

The inputs are the resources used by a unit to produce its outputs (products or services). They can be controlled or uncontrolled. We will use three inputs in our model: Total assets, number of employee and operating expenses.

Outputs are of two types. One indicator of financial performance: financial revenue (FR) and a social performance indicator measuring depth and breadth of outreach which is: number of active borrowers\*%female borrowers, following Ben soltane (2008). The number of active borrowers reflects breath of the program, which means the ability of the MFI to use its resources to serve the maximum of customers. The depth of outreach is defined by Navajas and al. (2000) as "the value the society attaches to the net gain from the use of the micro credit by a given borrower". Regarding the depth of outreach, we used the number of female borrowers as an

indicator because women often face greater problems than men in accessing financial services (Meyer, 2002). The percentage of women is selected as a factor of weighting the number of borrowers. According to Ben Soltane (2008), MFI that offer loan with relatively high amounts will be penalized.

With three inputs and two outputs the rule of thumb suggested by Banker et al. (1989) is verified. The inputs and outputs variables used in our study and their definition are presented in table3.

**Table 3: Inputs and outputs selected for the study**

	Definition
<b>Inputs:</b>	
Total Assets	Total of all net assets accounts
Number of employees	The number of individuals who are actively employed by the MFI. This includes contract employees or advisors who dedicate the majority of their time to the MFI, even if they are not on the MFI's roster of employees
Operating Expense	Expenses related to operations, including all personnel expense, depreciation and amortization, and administrative expense.
<b>Outputs:</b>	
Financial Revenue	Revenues from the loan portfolio and from other financial assets are broken out separately and by type of income (interest, fee).
Number of active borrowers * % female borrowers	Number of active borrowers who are female

Note: Definitions adopted are those of the Microfinance Information Exchange

Descriptive statistics for conventional and Islamic MFI are presented in Table 4. The difference between two groups is large, as revealed by the averages in the column Mean. For example, conventional MFI counts, on average, 3 times more employees than an Islamic MFI. Also outreach, measured by the number of active women borrowers differs significantly. Conventional MFIs seem to reach 5 times more women than Islamic MFI, suggesting that conventional MFI are better at promoting women empowerment.

**Table 4: Descriptive statistics for conventional and Islamic MFIs, values 2010**

Variables	Mean	sd	median	Min	Max
<b>Conventional MFI</b>					
<b>Inputs</b>					
Total assets	27643618	55844589	7996106	5918,05	3,29E+08
Personnel	264	385	112	9	2124
Operating Expense	2986026	4746520	1272356	2477,15	27080264
<b>Outputs</b>					
Number of borrowers*% of female	25624	40735	4274	35	159890
Financial Revenue	5508317	10619783	1964772	2561,44	64411935
<b>Islamic MFI</b>					
<b>Inputs</b>					
Total assets	15575009	20142331	6001893	741271,7	72705090
Personnel	86	74	70	24	312
Operating Expense	1570462	1842923	964945	11564,09	7105870
<b>Outputs</b>					
Number of borrowers*% of female	4700	4781	2655	47	15083
Financial Revenue	2471968	2796681	1052045	97724,15	9026976

Source: Authors' calculations based on Microfinance Information Exchange (MIX) data



### 3.3 Test of return to scale:

In this section we will test the nature of returns to scale before implementing the DEA model. Previous studies assumed variable (VRS) or constant return to scale (CRS) without testing if such hypothesis holds empirically. At this purpose, we have applied the Simar and Wilson (2002) bootstrap-based procedure to test the nature of returns to scale of the different MFI in the MENA region. Therefore, we will compute the DEA efficiency score for three inputs and two outputs according to its convenient returns to scale assumption.

Formally, Simar and Wilson (2002) establish the following test:

**Test**

$$H_0: T \text{ is globally CRS}$$
$$H_A: T \text{ is VRS}$$

For this test the null hypothesis is the production set exhibits CRS and the alternative hypothesis is that it shows VRS.

By construction  $\hat{\xi}_{1n}^{crs} \leq 1$ , the null hypothesis is rejected when  $\hat{\xi}_{1n}^{crs}$  is significantly less than 1. The critical value (for deciding if the test statistic is significantly less than 1) can be derived from bootstrapping (Simar and Wilson, 2002).

If  $H_0$  is rejected, then we have to perform another test with a less restrictive, non increasing return to scale (NIRS) versus VRS. The test is similar to the first test and the decision will be made based on the critical value from the bootstrapping.

With three inputs and two outputs as defined above, we obtain for this test (with 2000 replications) a  $p$ -value  $> 0,05$  (Appendix A.) for the five years under study (2005-2010), hence we cannot reject the null hypothesis of CRS.

## 4. Financial performance of MFI

As we said before, our sample of Arab MFI is divided in two categories or groups: conventional and Islamic microfinance institutions. We focus our analysis on their efficiency for the period 2005-2010. First, we compute the input-oriented CRS DEA in order to identify the most efficient Microfinance institutions in the MENA region.

### 4.1 DEA efficiency scores

We use a sample of Islamic and conventional MFI over the period 2005 to 2010 to assess whether there are significant differences between conventional and Islamic MFI. For the first step, we compute the input-oriented CRS DEA estimates.

**Table4: of the CRS input oriented DEA scores for Islamic and Conventional MFI**

Institution Type	Mean	Std, Dev,	Min	Max
2005				
Islamic	88%	14%	66%	100%
Conventional	85%	17%	40%	100%
2006				
Islamic	86%	16%	61%	100%
Conventional	82%	19%	38%	100%
2007				
Islamic	78%	20%	54%	100%
Conventional	80%	22%	11%	100%
2008				
Islamic	70%	27%	14%	100%
Conventional	79%	20%	24%	100%
2009				
Islamic	72%	24%	25%	100%
Conventional	81%	17%	46%	100%
2010				
Islamic	77%	21%	36%	100%
Conventional	77%	20%	27%	100%

Source: Authors' calculations

Average results by institution type (Islamic vs. Conventional) are presented in table 4. The mean efficiency for the DEA scores for the year 2005 for Islamic and Conventional MFI is respectively 0.88 and 0.85, this implies that the mean potential for input savings among MFIs is respectively equal to 0.12 and 0.15. For individual years, we can observe fluctuations in the average efficiency for the period under study. These fluctuations are more visible from the following figure.

**Figure3. Evolution of the efficiency for Islamic and conventional MFI period (2005-2010)**

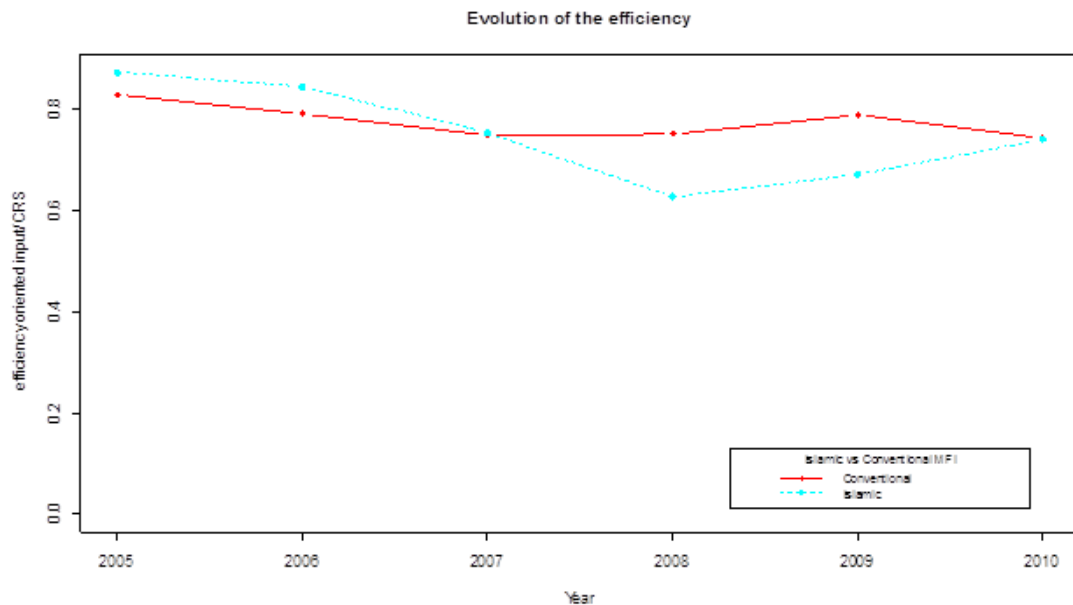


Figure3 displays the geometric mean of the efficiency of the Islamic and conventional MFI for the period under study.

From the analysis of this figure, we can note that there is a significant difference in the average efficiency for the two groups. On average, DEA estimators reveal that Islamic MFI appear to be more efficient than conventional institutions for the first sub-period 2005-2007. The technical efficiency of the Islamic MFI has steadily declined after 2005. For the second sub-period 2007-2010, conventional institutions seem to outperform. For this sub-period, the average efficiency of Conventional microfinance is evolving inversely to the average efficiency of Islamic MFI. The change in the average performance begins in 2007 when the Global Financial Crisis started. Many Observers have pointed to the higher efficiency and stability of Islamic banks during the period of crisis, but there are no studies that have investigated the case of MFI comparing to their Islamic counterpart. Our results give evidence, contrary to expectations, of the superior performance of conventional MFI during the crisis. Performance of these institutions is also more stable in the time. We have to keep in mind however that the majority of the MFI from the MENA region are NGO and not commercial banks. We have also to remind that most Islamic microfinance institutions offer both conventional and Islamic products, except the case of Sudan and Iran where only Islamic products are permitted. But not all institutions provide separate sets of financial statements which make difficult to compute quantitative indicators. This empirical evidence requires therefore careful interpretation.

Figure3 shows the existence of difference between the average efficiency of Islamic and Conventional MFI for the period under study; however it will be interesting to empirically confirm this difference. In other words, we are interested in testing whether there are significant differences between efficiencies of the two groups. One of the drawbacks of DEA is that it is classified as a non statistical or deterministic approach that does not easily allow genuine hypothesis testing (Bogetoft and Otto, 2011). However, considerable progress has been made over the last years in respect to the use of statistical models. Bogetoft and Otto(2011), have exposed in their book situations for which it is interesting to perform hypothesis tests and construct confidence intervals based on DEA models and the ways to carry them. According to these authors, there is generally three major ways to conduct these tests which are: non-parametric tests, parametric tests and the bootstrap approach that has become popular with the development of effective computer programs. For the latter, Simar and Wilson (2002) adapt the testing procedure based on bootstrapping described above to the problem of testing returns to scale. The tests presented by Bogetoft and Otto (2011) are based on asymptotic statistical theory. Even if relying on asymptotic theory means that the theoretical properties are only established for large simple, simulation studies based on moderate size (50 firms or more) suggest that they can be used quite generally (Bogetoft and Otto, 2011).

**4.2 Test of group differences**

If the set of  $K$  firm or DMU is divided into two groups  $K_1$  and  $K_2$  firms, with  $K = K_1 + K_2$ , we have to test:

$$H_0: g_1 = g_2 \text{ against } H_1: g_1 \neq g_2$$

With  $g_1$  and  $g_2$ , the density of the distribution of the efficiencies respectively in group 1 and group 2.

According to Bogetoft and Otto (2011), the distribution of  $t(F)$  and  $t(\emptyset)$  is the true efficiency are asymptotically the same if  $t(\emptyset)$  is exponentially distributed, a chi-square distribution with 2 degrees of freedom, then  $\sum_{k=1}^K t(F^k)$  is asymptotically *Chi – square* distributed with  $2K$  degrees of freedom.

Under the null hypothesis, the two groups have the same distribution of efficiency, the alternative is that the distribution of efficiency is different, and the ratio is

$$T_{EX} = \frac{\sum_{k \in K_1} t(F^k)/K_1}{\sum_{k \in K_2} t(F^k)/K_2}$$

$T_{EX}$  is the ratio of two asymptotically Chi-square distribution and is therefore asymptotically distributed as a Fisher distribution with  $2K_1$  and  $2K_2$  degrees of freedom.  $T_{EX}$  can be greater or less than 1, then it is a two-sided test.

Assuming that true efficiency is  $\emptyset = 1 + \epsilon$  where  $\epsilon$  is exponential distributed, then we should simply use  $t(F) = F - 1$

Such that

$$T_{EX} = \frac{\sum_{k \in K_1} t(F^k - 1)/K_1}{\sum_{k \in K_2} t(F^k - 1)/K_2}$$

If  $T_{EX}$  is greater than the 95% quantile in the distribution F, the null hypothesis is rejected.

If  $t(\emptyset)$  has a half normal distribution, then  $t(\emptyset)^2$  is chi-square distributed. And therefore,  $\sum_{k=1}^K t(F^k)^2$  is asymptotically chi-square with  $K$  degrees of freedom, the test statistic is:

$$T_{HN} = \frac{\sum_{k \in K_1} t(F^k)^2 / K_1}{\sum_{k \in K_2} t(F^k)^2 / K_2}$$

If there is no priori assumptions about the distribution of  $\phi_1$  and  $\phi_2$  Bogetoft and Otto (2011) suggest two non parametric tests: Kolmogorov-Smirnov test and Kruskal-Wallis test.

#### 4.3 Results of the Test for group differences

We want to test data from a group of MFI to determine if efficiency depends on the fact that the institution is Islamic or conventional. Then, group 1 is comprised of Islamic MFI, whereas group 2 is comprised of conventional MFI. We have calculated the  $T_{EX}$  and  $T_{HN}$  defined above and we will evaluate whether the efficiency of the two groups is identical or not.

The calculated value of the  $T_{EX}$  is equal to 1.183, and as the 97.5% upper critical value (the size of the test is 5%) in the F distribution is 1.315; we cannot reject the hypothesis that the distribution of efficiency is equal for the two groups.

The  $T_{HN}$  is equal to 1.335, and as the 97.5% upper critical value (the size of the test is 5%) in the F distribution is 1.463; we cannot reject the hypothesis that the distribution is equal for the two groups. The result of Kolmogorov-Sirmonov test support ( $p$ - values respectively equal to 0.497) the same findings.

Figure 4: box plot

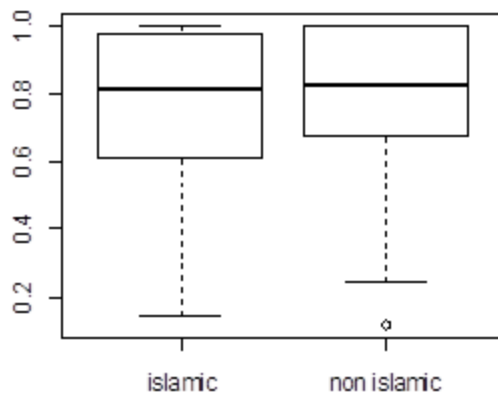
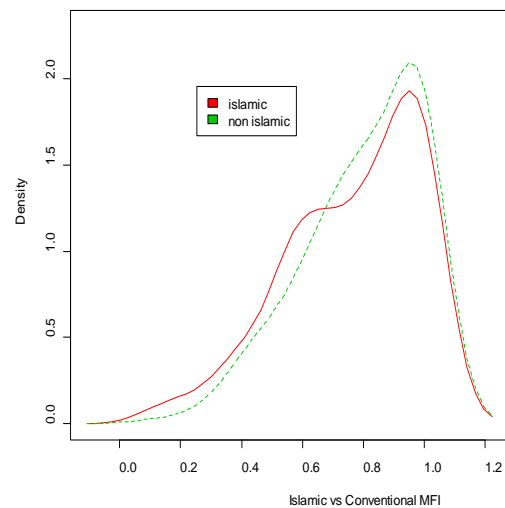


Figure 5: Density plot



Based in the box plot and densities in figure 4 and 5, it does look that the two groups have approximately the same density but the mass differ slightly. It seems that group1 of Islamic MFI has a tiny steeper mass than group2. We have to note that circle in the bottom of the box plot figure indicates that there is an outlier in the first group (conventional MFI).The test we have applied shows also that there is no significant difference. The average input efficiency is the same for the two groups of MFI. We can conclude therefore that the religion and more specifically the use of Islamic products do not affect the efficiency of MFI.

#### 5. Conclusion

In this study we deal with the emerging Islamic microfinance sector in MENA region, specifically how they compare with conventional institutions in terms of technical efficiency.

By using a non parametric DEA model for the period 2005-2010, our study shows no significant differences in the efficiency of the two groups. We can conclude therefore that the religion and more specifically the use of Sharia-compliant products does not affect the efficiency of MFI in the MENA region.

Nowadays Islamic finance is gaining considerable attention from regulators, financial service providers as well as other financial inclusion stakeholders. It has registered in the last few years a four-fold growth in the number of poor clients estimated to 1.28 million and has doubled in the number of providers. Nevertheless, it's still a nascent sector and many efforts must be done to build sustainable business models with a broad range of different products to meet the needs of Muslim poor people.

### Terms

*Sharia* : (Arabic: شريعة) is the moral code and religious law of Islam. Sharia deals with many topics addressed by secular law, including crime, politics, and economics, as well as personal matters such as hygiene, diet, prayer, and fasting. Though interpretations of sharia vary between cultures, in its strictest definition it is considered the infallible law of God—as opposed to the human interpretation of the laws.

There are two primary sources of sharia law: the precepts set forth in the Quran, and the example set by the Islamic prophet Muhammad in the Sunnah. Where it has official status, sharia is interpreted by Islamic judges (qadis) with varying responsibilities for the religious leaders (imams). For questions not directly addressed in the primary sources, the application of sharia is extended through consensus of the religious scholars (ulama) thought to embody the consensus of the Muslim Community (ijma). Islamic jurisprudence will also sometimes incorporate analogies from the Quran and Sunnah through qiyas, though Shia jurists prefer reasoning ('aql) to analogy. <http://en.wikipedia.org/wiki/Sharia> (Accessed 9 April 2013)

*Zakah* is the third of the five basic pillars of Islamic faith. Rules of Sharia are fairly clear and elaborate in defining the nature of who are liable to pay *zakah* and who can benefit from *zakah*. The first and foremost category of potential beneficiaries is the poor and the destitute. *Zakah* is a levy normally at the rate of 2.5% charged on certain types of wealth such as business wealth, personal income etc. Only the Muslims who own the wealth beyond the minimum limit are charged *zakah*.

On others terms, it is a compulsory levy imposed on the Muslims so as to take surplus money or wealth from the comparatively well-to do members of the Muslim society and give it to the destitute and needy. In Islam, all resources belong to God and the wealth is held by human beings only in trust. *Zakah* is also a part of a social system of Islam as the poor has certain rights in the wealth of the rich. *Zakah* has been variously described by scholars as a tool of redistribution of income and as a mechanism of poverty alleviation which helps closing the gap between the poor and the rich (AbdulRahim, 2007).

The word *waqf* in Arabic literally means “confinement and prohibition” or causing a thing to stop and stand still. In Islamic legal terminology, *waqf* is defined as protecting an asset in order to cease the usage and will be exploited and benefited for the purpose of charity (Ahmed, 2002).

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**Appendix A:** Tests of returns to scale: *p-values*

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<i>p-value</i>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
	0.189	0.132	0.080	0.113	0.075	0.094

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Source: Author's elaboration