

MICROFINANCE PERFORMANCE IN THE OIC MEMBER STATES – DOES REGULATION STATUS MATTER?

IFTEKHAR AHMED*

*Department of Accountancy and Finance
Otago Business School
University of Otago, New Zealand*

YUSNIDAH IBRAHIM

*School of Business and Social Sciences
Albukhary International University, Malaysia*

ABUL BASHAR BHUIYAN

*Faculty of Business and Accountancy
University of Selangor, Malaysia*

Despite the emerging concern of mission drift, microfinance institutions (MFIs) in various developing nations have been commercializing and transforming into regulated financial intermediaries. However, a hidden dread is still alive until it is disclosed that the regulated MFIs are actually performing better in both of their financial and social obligations. Hence, this study aims to investigate the effect of regulatory status on the performance of MFIs, using a panel dataset from the OIC member states containing 285 observation years for the period of 2011-2015. A robust estimation of OLS techniques to the general form of cross-sectional and temporal dependency were applied. The findings do not show any significant evidence that the regulatory status affects the profitability of MFIs. However, the result indicates that the regulated MFIs decrease their outreach to female clientele. The study additionally reveals that the interest rates accelerate the profitability, but it does not necessarily harm the outreach. Nevertheless, the study believes that ethical practices and fair pricing in MFIs must be contained so that the poor will not be exploited and MFIs can avoid mission drift.

Keywords: microfinance, OIC, outreach, profitability, regulation.

JEL Classification: G21, L25

1. Introduction

Microfinance Institutions (MFIs) are an alternative source of finance for the entrepreneurial poor in many developing economies. MFIs adopt a market approach to deliver loans to the poor in a sustainable manner (Kazemian et al., 2016). Many emerging countries have

*Corresponding author Email: iftekhhar.ahmed@otago.ac.nz/iftekhharhbs@gmail.com

witnessed a sustained and sharp growth of the microfinance industry (D'Espallier et al., 2017). This has gained a thriving attention from socially responsible and capita markets investors (Ibrahim et al., 2018). MFIs practice innovative lending methodologies; such as, individual and group-based lending of non-collateralized loans and charge market-based interest rate to reimburse the higher operating costs. Thus, the growing progress and veritable optimism of being integrated with the mainstream financial system reveals the need for regulation to construct a common ground in this industry (Christen et al., 2012). However, a question arises; does regulatory status affect the performance of MFIs? The question this study wishes to address.

Despite traditional financial intermediaries, which are subject to entry and follow specific regulations, MFIs can still operate being regulated or unregulated depending on their legal status. The global MFIs currently exist under various legal statuses; such as, bank, rural bank, non-bank financial institution, credit union and cooperative, non-governmental organizations (NGOs) and others (Kozubíková & Zoubková, 2016). On one hand, regulation is yet to be a form of entry restriction for many MFIs (Hartarska & Nadolnyak, 2007). On the other hand, being regulated and complying with associated supervision is notably costly (Cull et al., 2011). It can cost an MFI 5% of the total assets at the beginning and 1% or more in the following years (Christen et al., 2003). The microfinance sector is mostly unregulated or weakly regulated in many countries (Mersland et al., 2013). Hence, the self-interest of MFIs can only reinforce the transformation from unregulated to regulated MFIs.

The transformation is clearly visible in the microfinance industry. Because regulated MFIs are permitted to mobilize deposits and enhance loanable funds (Campion & White, 1999), thus over-dependence on subsidies declines. It is a chronic call that MFIs need to be prepared for an unexpected subsidy drought since the donors are declining (Armendáriz et al., 2011; Armendáriz & Morduch, 2010). Unregulated MFIs which are not allowed to perform deposits schemes and face scarcity of loanable funds usually borrow from various external financiers; such as, individual and institutional investors, formal financial intermediaries and government agencies (Ahmed et al., 2016). Therefore, exploring the impact of regulation status on microfinance performance is timely and important.

Regulatory and supervisory policies for financial institutions differ from country to country; for an instance, developed nations have well established financial, legal, and regulatory systems in comparison to developing or least developed economies (Demirgüç-Kunt et al., 2003). These systems eventually regulate the countries' banks, financial institutions and net interest margin. Relatively little cross-country evidence of the financial regulatory and supervisory systems in developing nations is available (Barth et al., 1998), whereby only a handful of studies have examined the issue rigorously in the microfinance industry. Moreover, researches underlining the impact of regulation on the performance of MFIs are numerable (Cull et al., 2011; Hartarska & Nadolnyak, 2007).

Financial institutions in the member states of the Organization of Islamic Cooperation (OIC) face quite a different prudential regulation and associated supervision due to diversity in law and order, legal enforcement, financial infrastructure, culture and norms, and religious faith (Mohieldin et al., 2011), so do the microfinance institutions. Despite the

regulation and legal enforcement of a nation, there is always an impact of religious beliefs on the customers' preference of choosing their options (Assadi, 2003; Guiso et al., 2003), even choosing financial institutions (Abou-Youssef et al., 2015; Ahmad et al., 2008). Thus, microfinance operations and their performance in the Muslim majority nations should be different than their counterparts. Therefore, the main objective of this study is to examine the influence of regulatory status on the performance of MFIs in the OIC member states.

Microfinance literature shows few studies have investigated the issue rigorously; such as, Hartarska and Nadolnyak (2007) and Cull et al. (2011). However, Hartarska and Nadolnyak (2007) concluded that their study was the first step to understand the issue and they recommended using specific regulatory intervention data in future research. For an instant; regulatory intervention due to implication or the practice of Sharia law in Muslim majority nations which is the context of this study. In addition, Cull et al. (2011) found intuitive results from an economic perspective, yet they left an open question that whether regulatory supervision for the betterment of MFIs' stability outweighs the declines in outreach. To the best of authors' knowledge, no study afterward took steps to continue the scholarly argument.

Therefore, key purpose of this research is to examine the role of regulation on the performance of MFIs. The principal contribution of this study is to shed light on this academic argument and try to answer above question that has emerged from existing literature. Apart from that, significance of the paper is controlling regulated MFIs in separated models despite adopting positive approach to analyze the issue. Moreover, the panel dataset used in this study containing cross-country information, macroeconomic factors and regional dummies, thus it will capture the country level impact and distinguish geographic performance of MFIs. Controlling these factors are important since research identified that institutional quality also affects economic growth (Di Vita, 2017; Dollar, 2016). Moreover, precise banking regulation is primitive demand and admittedly an indispensable piece of financial system for a nation (Caprio, 1997, 1998; Demirgüç-Kunt & Detragiache, 1998). Therefore, the findings of this study will guide to reform and improve regulatory and supervisory policies for MFIs in the OIC member states. Though the OIC is a very diverse in its own nature, yet one thing is common; the religion which is the major source of regulatory and policy transition in a Muslim majority nation.

The rest of the paper is organized as follows: Section II describes a review of the literature, research methodology has explained in Section III that includes; model specification, variables description and data collection method. Later Section IV discusses the empirical findings. At the end, Section V provides the concluding remarks, limitation, recommendation and implication of the study.

2. Literature Review

2.1. Regulation of Financial Institutions in Practice

Technically, studies that address the effects of regulation and supervision on the performance of financial institutions (FIs) are mostly on traditional banks and insurance

companies (Barth et al., 2004; Barth et al., 2013; Chortareas et al., 2012; Čihák et al., 2012; Psillaki & Mamatzakis, 2017; Triki et al., 2017). Despite all regulatory supervision, banking regulation can do more destruction than decent if it is not well structured (Schmidt, 2000). Likewise, Barth et al. (2004) found negative relation between regulation and bank performance, however, the institutional environment supportive of banks' private sector supervision observed to have a positive effect.

However, the global financial crisis in 2008 reignited the concern to strengthen regulatory supervision for FIs to safeguard global financial systems (Triki et al., 2017). Consequently, international communities have agreed on several numbers of reforms in the financial regulatory framework, among others the Basel committee on banking supervision's reform package or Basel III was the notable one (Basel Committee, 2010). Though practitioners believe that the global financial industry protected after regulatory reform, the view about the impact of regulation on the traditional banking sector derives from two extended dimensions; private interest view and public interest view (Triki et al., 2017).

The private interest view advocates that strict regulatory supervision is trend to lead to corruption in lending, the related authorities (government and politicians) utilize it to increase their own welfare and they abuse regulation as a shield and channel money to individual or group they prefer, resulting corporate misconduct and obstructing banking efficiency (Shleifer & Vishny, 2002; Taylor & Quintyn, 2002; Triki et al., 2017). On the contrary, the public interest view fosters the reverse thought and proposes that tight regulatory supervision of banks provides direct monitoring power that reduces chances of market failure, decreases corruption in lending, encourage competitions, enhance capital allocation efficiency, thus improves banking performance (Beck et al., 2006; Triki et al., 2017).

Banks' regulation implements several restrictions on banking operations and not every restriction facilitated the performance of banks. Tighter regulation on capital increase banks' efficiency (Barth et al., 2013; Psillaki & Mamatzakis, 2017), while greater regulatory stringency to banks' activities impedes efficient banking operations (Barth et al., 2013; Beck et al., 2006). The authors also revealed that strengthen regulatory supervision is favourable for banks' performance in a country where regulatory and supervisory authorities are independent (Barth et al., 2013). In the context of Africa, the impact of regulation and supervision on banks' performance depends on the size and risk level of the institutions; hence regulation should be adapted based on size and risk level of particular FIs (Triki et al., 2017). In addition, regulatory environment used to influence risk-taking attitude of banks that lead to uplift of the performance (Ly, 2015).

2.2. Regulation and MFIs' Performance

Despite practicing financial activities, MFI is far different from commercial financial institutions (CFIs) due to its dual missions, which are financial sustainability and outreach to the poor (Ibrahim et al., 2018; Vanroose & D'Espallier, 2013). Therefore, regulations of this form of socially responsible financial institutions would vary and need special

treatment, in some extent may require independent regulatory frameworks (Kirkpatrick & Maimbo, 2002). Practically, the regulating tendency of MFIs depends on diversified approaches with several dimensions; such as, the object of regulation, the optimal phase from beginning to regulate, and the type of legislation. From the perspective of legislation types, MFIs are either regulated by the existing banking laws or specialized laws should be constructed. However, a pragmatic approach has been adopted by a majority of the countries for the supervision of the industry. Hence, ample scope is still available to inquire the issue in the microfinance sector.

Regulation and supervision provide favorable outcomes in the market-based financial institutions compare to traditional bank-based counterpart (Ly, 2015), for an instant, microfinance institutions. Microfinance institution as a market-oriented financial intermediary requires an enormous amount of capital to meet its market demand (Ahmed et al., 2018). Receiving deposits is one of the methods that MFIs exercise to enhance its capital supply (Khachatryan et al., 2017). However, MFIs in every state do not allow taking deposits as regulatory policy does not permit to do so, resulting scarcity of capital, limited financial self-sufficiency and lower outreach performance (Ahmed et al., 2018; Hartarska & Nadolnyak, 2007). This is one of the key reasons of transformation from unregulated to regulated MFIs that allow them to collect deposits and enlarge their loanable funds (Campion & White, 1999).

Regulation for MFIs to deal with potential issues counts costs, thus it is substantial to examine the impact of regulation on MFIs' performance (Hartarska & Nadolnyak, 2007). A study on Ghana revealed that enforcing regulatory supervision was expensive than its potential impact that it may create on the financial system (Steel & Andah, 2008). However, this is not scenario in the Latin America. MFIs in this region took the first initiative of transformation (Ledgerwood & White, 2006) and established notable success story in accomplishing microfinance dual objectives simultaneously (Battilana & Dorado, 2010). Success story of few MFIs in Latin America is well reported, however, policy implication may not suitable depending these case may not appropriate since successful transformation depends on the accepting environment of the specific country (Cuevas, 1996).

Among two types of regulations; non-prudential and prudential, majority of MFIs encounter some form of non-prudential regulation (Cull et al., 2011). These regulations can include fraud prevention, ownership minimization, operations and formation, decreasing the rate of interest, transaction security, building credit information services, accounting and taxation matters (Christen et al., 2003). It is unusual to enforce prudential regulation unless to protect small depositors (Cull et al., 2011). Previous study focused chiefly on the relationship between regulatory supervision and the financial performance, considering outreach to the poor as a minor concern (Cull et al., 2011).

A study by Hartarska and Nadolnyak (2007) was aimed to identify the performance differences of regulated and unregulated MFIs using a positive approach. They used 114 MFIs' newly released data from 62 nations in an empirical model where performance was specified as a function of MFI-specific, regulatory, institutional, and macroeconomic variables. The research did not find any direct influence of regulatory involvement in the

microfinance performance in terms of operational self-reliance and reaching out to the poor. As a policy implication, the authors have asserted that transformation of MFIs from unregulated to regulated financial intermediaries might not drive to enhance financial and outreach results. However, evidence shows that MFIs are reaching more clients, by those collecting savings. As a result, the authors have concluded that MFIs might have indirect benefits, if being regulated is merely an option of permitting MFIs to mobilize deposits.

Cull et al. (2011) conducted a research to understand the implications of regulation on the profitability and outreach to female and small-scale borrowers in the microfinance industry. The study constructed a dataset on on-site supervision from 245 leading global MFIs and analyzed them using regression models. Using OLS estimates in the first model, the analysis found a negative effect of supervision on the profitability measure. However, employing treatment effects and instrumental variables regressions after controlling for the non-random assignment of supervision, the authors found that supervision is significantly associated with larger average loan sizes, thus the MFIs maintain their profit growth. However, they curtail the outreach to females and borrowers who are costly to reach. In addition, the findings also revealed that MFIs with a limited commercial tendency might curtail profitability, but comply with their outreach mission.

Regulated MFIs in the Central and Eastern Europe region showed lower return on assets compare to its counterparts and infirm evidence that outreach breadth may have any connection to the regulatory status (Hartarska, 2005). Using an endogenous equations approach, a different study also tried to quantify the nexus between regulation and MFIs' performance using binary regulation indicator variable, however, the authors did not find any significant effect of having regulatory status on the financial performance and outreach (Mersland & Strøm, 2009). Following Mersland and Strøm (2009), this study also employs binary variable for regulation to examine the relationship.

3. Methodology

3.1 Model Specification

The empirical model hypothesizes that several factors may influence MFIs' performance significantly; however, regulatory status does not have a strong significant impact on the performance. The purpose of this research, therefore, is to examine MFI performance and to understand whether the regulatory status affects the profitability and outreach of MFIs. Hence, the benchmark regressions are the way to understand the hypothesized relation. Microfinance specific variables and institutional characteristics, including MFI-size, MFI-experience, interest rates (proxies by yield), portfolio quality, and geographic presence have been specified by empirical research (Cull et al., 2007). In line with the existing literatures, the following empirical models have been developed to test the hypothesis. The empirical models for profitability measure are:

$$\text{OSS}_{it} = \alpha + \beta_1 \text{Regulated}_{it} + \beta_2 \text{Yield}_{it} + \beta_3 \text{PAR}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Experience}_{it} + \beta_6 \text{Inflation}_{it} + \beta_7 \text{GDP}_{it} + \beta_8 \text{Control}_{it} + \beta_9 \text{Region}_i + u_{it} \quad (1)$$

$$ROA_{it} = \alpha + \beta_1 \text{Regulated}_{it} + \beta_2 \text{Yield}_{it} + \beta_3 \text{PAR}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Experience}_{it} + \beta_6 \text{Inflation}_{it} + \beta_7 \text{GDP}_{it} + \beta_8 \text{Control}_{it} + \beta_9 \text{Region}_i + u_{it} \quad (2)$$

Where, OSS_{it} refers to the operational self-sufficiency ratio of microfinance institution i at time t . OSS measures how well an MFI is able to compensate its costs from its operating income. Moreover, ROA_{it} is the return of asset ratio of microfinance institution i at time t . ROA measures how well an MFI utilizes its total assets and operational revenues to bear costs or generate income. Both OSS and ROA are included in the models as a *proxy* for profitability. On the other hand, the empirical models for outreach measurements are:

$$ALSG_{it} = \alpha + \beta_1 \text{Regulated}_{it} + \beta_2 \text{Yield}_{it} + \beta_3 \text{PAR}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Experience}_{it} + \beta_6 \text{Inflation}_{it} + \beta_7 \text{GDP}_{it} + \beta_8 \text{Control}_{it} + \beta_9 \text{Region}_i + u_{it} \quad (3)$$

$$PFB_{it} = \alpha + \beta_1 \text{Regulated}_{it} + \beta_2 \text{Yield}_{it} + \beta_3 \text{PAR}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Experience}_{it} + \beta_6 \text{Inflation}_{it} + \beta_7 \text{GDP}_{it} + \beta_8 \text{Control}_{it} + \beta_9 \text{Region}_i + u_{it} \quad (4)$$

Where, $ALSG_{it}$ refers to the average loan size adjusted by GNI per capita ratio of microfinance institution i at time t . $ALSG$ measures how well an MFI is able to serve the poorest demography that eventually indicates MFIs' outreach to the ultra-poor. In addition, PFB_{it} is the percentage of female borrowers of microfinance institution i at time t . PFB represents the percentage of female borrowers who are currently served by MFIs. $ALSG$ is generally used as a proxy for depth of outreach, whereas, PFB is used to measure depth as well as breadth of outreach. Hence, this study includes both $ALSG$ and PFB in the models as a proxy for outreach in a wider view.

Regulated is a time consistent dummy variable used in the models to understand the effect of regulatory status on the profitability and outreach of MFIs. *Yield* refers to the nominal gross portfolio yield, a proxy measure of interest rates charged by the MFIs from its clients as explained in Table 1. *PAR* is portfolio at risk ratio >30 days. It is a widely used indicator for loan portfolio quality. The ratio has to be divided by the gross loan portfolio to calculate the portfolio risk below 30 days. *Size* is the natural logarithm of total assets. The purpose of using logarithmic value is to terminate possible heteroscedasticity (Ahmed et al., 2016; Quayes, 2012). *Experience* is the natural logarithm of total functioning years as an MFI, using the year of inception as the reference point. The macroeconomic indicators (*inflation* and *GDP*) refer to country contextual economic diversity that is included for controlling the estimates since the economic situation differs in the region.

Along with the institutional specific and macroeconomic variables, this research also includes two sets of four control variables at vector $Control_{it}$ that are theoretically or empirically associated with profitability and outreach measures in microfinance studies. Two profitability control variables are the operating expenses ratio (OE) and the financial expenses ratio (FE). *OE* refers to MFIs' administrative and personal expenses, but it does not consider the loan loss provision and financial expenses. *FE*, on the contrary, refers to the total interest expense the MFI incurs to fund its lending portfolio. The FE ratio can guide MFIs to determine the minimum interest rate that institutions need to charge in order

to cover its funding cost. Considering the differences in the MFI-size, both OE and FE are divided by the average periodic total assets.

Moreover, the two outreach control variables are borrower per staff member (BPSM) and cost per borrower (CPB). *BPSM* refers to the level of interaction and personal attention of microfinance personnel with clients, and loads of activities. According to Kar (2011), *BPSM* is an appropriate proxy to measure MFIs' productivity. In addition, *CPB* is an efficiency indicator and it measures the average expense to maintain an active borrower. Mersland and Strøm (2010) reveal that *CPB* has a significant relation with the average loan size, since one increase with the other. Hence, it also has a large impact on mission drift. Furthermore, the study also includes a set of time-invariant regional dummies, such as, SSA, EAP, EECA, MENA, and SA at vector $Region_i$ for each main region of the OIC member countries, with 'SA' as the omitted category. Regional dummies are employed to specify the MFIs' profitability and outreach in the different geographical locations. α and β are the vectors of parameters, while u is the usual error term.

Table 3 shows that the descriptive statistics and mean values stated in the table are generally within the expected range, however, a wide gap can still be seen between minimum and maximum values in some context. In addition, this study also has a suspicion on adequately fulfilling all of the basic assumptions of regression analysis, including non-influence of outliers and normality, independence of observations, and homoscedasticity of the residual distribution after considering almost every possible measure, such as, variable transformation and so on. However, these are the usual phenomena in such studies and there are several ways to resolve these issues and to strengthen the model against unruly data.

To address fully or partially unfulfilled fundamental assumptions, robust regression analysis provides a precise estimation than the ordinary least squares (Ibrahim et al., 2018). Therefore, as a check on robustness to possible unfulfilled assumptions, the Driscoll and Kraay (1998) or *DK* standard errors have been used in all estimations, that is robust to heteroscedasticity, autocorrelation, and the general form of cross sectional and temporal dependency (Driscoll & Kraay, 1998).

Despite Driscoll and Kraay (1998); Huber (1967), Eicker (1967), White (1980), and Newey and West (1987), all these covariance matrices estimating techniques are robust to certain violations of model assumptions in the regression, however the cross-sectional correlation is not considered in their methods (Eicker, 1967; Huber, 1967; Newey & West, 1987; White, 1980). Fortunately, Driscoll and Kraay propose a non-parametric covariance matrix estimator that produces heteroscedasticity and autocorrelation-consistent standard errors that are robust to general forms of spatial and temporal dependence (Hoechle, 2007). Ordinary least squares with robust clustered standard error, Huber-White standard errors, and Newey-West standard errors are also run, but all of them came up with mostly similar coefficients. Hence, robust estimations are only reported with *DK* standard errors.

3.2 Variables

The dependent variables in this investigation are the operational self-sufficiency (OSS), return on assets (ROA), average loan size adjusted by GNI per capita (ALSG) and

percentage of female borrowers (PFB). OSS is the widely used proxy for profitability of not-for-profit organizations, such as MFIs. Though there are studies that have used financial self-sufficiency as the indicators for profitability (Ahmed et al., 2016; Cull et al., 2011; Kar & Swain, 2014), however, the use of operational self-sufficiency is arguably wider because OSS does not include costs of own funds and donors’ preference toward this indicator (Ibrahim et al., 2018; Kar, 2011; Quayes, 2015).

The value of OSS is generated after dividing the operating income by the total of financial expense, operating expense, and loan-loss expense. Hence, the value equal to or greater than one implies that the institutions are able to cover all its administrative expenses and loan losses from its operating income. OSS and ROA will capture the profitability of MFIs. On the other hand, ALSG and PFB are the proxy for outreach of MFIs. These indicators are predominantly used in the microfinance literature to measure the depth of outreach (Kar, 2013; Hussain & Ahmed, 2020; Nurmakhanova et al., 2015). Table 1 briefly explains all variables employed in this study.

Table 1 Description of variables

Variables	Descriptions
OSS: Operational self-sufficiency	Financial Revenue / (Financial Expense + Impairment Losses on Loans + Operating Expense)
ROA: Return on asset	(Adjusted Net Operating Income - Taxes) / Adjusted Average Total Assets
ALSG: Average loan size/GNI per capita	Adjusted Average Loan Size per Borrower/GNI per Capita
PFB: Percentage of female borrowers	Number of active female borrowers/Adjusted Number of Active Borrowers
Yield: Nominal yield on gross portfolio	Adjusted Financial Revenue from Loan Portfolio / Adjusted Average Gross Loan Portfolio
PAR: Portfolio at risk, 30 days past due	Outstanding balance, portfolio overdue > 30 days + renegotiated portfolio / Adjusted Gross Loan Portfolio
Size	The natural logarithm of total assets in US\$
Experience	Years functioning as an MFI
Inflation: Rate of inflation	Annual change in average consumer prices
GDP: Rate of GDP growth	Annual growth in the total output of goods and services occurring within the territory of a given country
OE: Operating expenses / assets	Adjusted Operating Expense / Adjusted Average Total Assets
FE: Financial expenses / assets	Adjusted Financial Expense / Adjusted Average Total Assets
BPSM: Borrower per staff member	Adjusted Number of Active Borrowers / Number of Personnel
CPB: Cost per borrower	Adjusted Operating Expense / Adjusted Average Number of Active Borrowers
Regulated	A dummy that equals 1 if the MFI is regulated, 0 otherwise
SSA: Sub-Saharan Africa	A dummy that equals 1 if the MFI is in the Sub-Saharan Africa region, 0 otherwise

(Contd.)

Variables	Descriptions
EAP: East Asia and the Pacific	A dummy that equals 1 if the MFI is in the East Asia and the Pacific region, 0 otherwise
EECA: East Europe and Central Asia	A dummy that equals 1 if the MFI is in the East Europe and Central Asia region, 0 otherwise
MENA: Middle East and North Africa	A dummy that equals 1 if the MFI is in the Middle East and North Africa region, 0 otherwise
SA: South Asia	A dummy that equals 1 if the MFI is in the South Asia region, 0 otherwise

Source: Authors' and MIX's indicator definitions.

3.3 Data

This research constructs a cross-country unique panel dataset containing observations for the time span of 2011-2015 on 57 MFIs in 23 OIC member states. Individual MFI data were collected from the Microfinance Information Exchange (the *MIX market*), a not-for-profit private organization that intends to facilitate exchanging information in the microfinance sector. Apart from that, data related to regulation status were collected through a qualitative approach that includes observing each institution's website and rating report. Moreover, the country context data were retrieved from the World Bank databank and counter-checked with the data source at the International Monetary Fund (IMF). Table 2 describes the classification of selected OIC member countries and reports number of MFI has utilized.

Table 2 Classification of selected OIC member states and number of MFI utilized

Country	Income Group ¹	Least Developed Countries (LDCs) ²	Heavily Indebted Poor Countries (HIPC) ³	Human Development Category ⁴	Number of MFI utilized
Afghanistan	Low	✓	✓	Low	1
Azerbaijan	Upper Middle			High	6
Bangladesh	Lower Middle	✓		Medium	6
Burkina Faso	Low	✓	✓	Low	1
Cameroon	Lower Middle		✓	Low	2
Egypt	Lower Middle			Medium	4
Indonesia	Lower Middle			Medium	2
Jordan	Lower Middle			High	3
Kazakhstan	Upper Middle			High	3
Kyrgyzstan	Low Middle			Medium	5
Lebanon	Upper Middle			High	1
Morocco	Lower Middle			Medium	3
Mozambique	Low	✓	✓	Low	1
Niger	Low	✓	✓	Low	1

Country	Income Group ¹	Least Developed Countries (LDCs) ²	Heavily Indebted Poor Countries (HIPC)s ³	Human Development Category ⁴	Number of MFI utilized
Nigeria	Lower Middle			Low	1
Pakistan	Lower Middle			Medium	1
Palestine	Lower Middle			Medium	2
Senegal	Low	✓	✓	Low	3
Tajikistan	Low Middle			Medium	7
Togo	Low	✓	✓	Low	1
Tunisia	Lower Middle			High	1
Uganda	Low	✓	✓	Low	1
Uzbekistan	Low Middle			High	1
Afghanistan	Low	✓	✓	Low	1

Source: World Bank^{1,4}, UNCTAD², FAO³ and UNDP⁵.

The institutions were selected based on the global ranking of MFIs suggested by the leading supervisory committee. Rating assessment has been conducting by the third-party authority, thus using rated MFIs in the analysis is more immaculate. Additionally, previous studies have also relied on rated MFIs for quality of data (D'Espallier et al., 2011; Ibrahim et al., 2018; Hartarska & Mersland, 2012). There were neither many institutions that fitted within the list nor were all of them currently 5-diamonds rated. Therefore, this study further sorted the list based on the current diamond rating. Hence, MFIs with at least 3-diamonds have been selected for this sample. The data set used in the study, hence do not represent the whole microfinance industry in the OIC region. However, they collectively serve a large number of microfinance clients globally. A previous study found that the largest 30 MFIs account for about 90 per cent of microfinance clients served by top 234 organizations (Honohan, 2004). As a result, arguably, the MFIs' sample used in this study serves as the majority of the clients in the OIC region during the investigation period.

4. Empirical Results And Discussion

4.1 Descriptive Statistics

The minimum, maximum, and standard deviation values of the major explanatory variables other than the regulatory status dummy indicate their extensively disproportionate distribution within the OIC microfinance industry. The descriptive statistics in Table 3 denotes that the mean value of operational self-sufficiency is above 1, suggesting that the OIC-MFIs are performing well in terms of generating cost-covering income. The summarized values of return on asset vary between (-0.18) to 0.18 and the mean value of 4 percent clearly indicates that the return on assets of a majority of the sampled MFIs is on the low end.

Average loan size adjusted by GNI per capita ratio ranges within 0.03 to 4.29 and the mean value of 70 percent simply shows that most of the selected MFIs are serving

the lower order of the poor demography. The summarized values of the percentage of female borrowers vary between 1 percent and 100 percent which suggests that the referred sampled MFIs are quite disproportionately distributed and the mean value of a little over 59 percent indicates that the female borrower's proportion is not satisfactory in representing the outreach to female clients and women empowerment. The summary statistics also show that over 82 percent of the sampled MFIs are regulated by either banking or specialized supervisory laws.

The yield rate is between (-0.06) to 0.66 that refers to a disproportionately distributed sample. The average 32 percent nominal yield is indeed on the high side. The PAR ratio ranges between (-0.04) to 0.98 and the mean value of 5 percent clearly asserts that the sampled MFIs have a relatively better loan portfolio quality. In addition, the mean value of the Size variable indicates that almost 18 percent of the sampled MFIs own fixed assets. Hence, a remarkable number of the MFIs' assets is current and intangible in nature. The average operating years as an MFI in the sample are a little over 17.5 years. Therefore, arguably, most of the sampled MFIs are relatively experienced, i.e., the newest MFI in the sample is 5 years and the oldest was established 65 years ago. Moreover, an average of 5.41 percent inflation rate and 4.61 percent GDP growth rate reflect the relatively stable economic situations for the microfinance operations in countries where the sampled MFIs are located.

Table 3 Descriptive statistics

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
OSS	285	1.22	0.27	0.59	2.63
ROA	285	0.04	0.05	-0.18	0.18
ALSG	285	0.70	0.86	0.03	4.29
PFB	285	0.59	0.27	0.01	1.00
Yield	285	0.32	0.12	-0.06	0.66
PAR	285	0.05	0.10	-0.04	0.98
Size	285	17.71	1.40	14.23	21.24
Maturity	285	17.72	10.22	5	65
Inflation	285	5.41	3.77	-3.75	18.69
GDP	285	4.61	2.67	-4.15	14.43
OE	285	0.15	0.07	-0.01	0.45
FE	285	0.05	0.03	-0.01	0.14
BPSM	285	134.43	115.05	11.17	1001.50
CPB	285	183.61	161.05	-98.74	1029.91
Regulated	285	0.82	0.38	0	1
SSA	285	0.19	0.40	0	1
EAP	285	0.04	0.18	0	1
EECA	285	0.39	0.49	0	1
MENA	285	0.25	0.43	0	1
SA	285	0.14	0.35	0	1

Table 4 Pearson correlation between independent variables

Variables	Yield	PAR	Size	Experience	Inflation	GDP	OE	FE	BPSM	CPB	Regulated	SSA	EAP	EECA	MENA	SA
Yield	1															
PAR	-0.3009*	1														
Size	-0.2848*	0.1289*	1													
Experience	-0.3834*	0.2717*	0.1408*	1												
Inflation	0.2788*	-0.1427*	-0.0704	-0.1929*	1											
GDP	-0.0046	-0.012	0.0487	-0.0567	0.2296*	1										
OE	0.7873*	-0.2628*	-0.2453*	-0.3382*	0.0658	0.0108	1									
FE	0.3211*	-0.1486*	0.0605	-0.3266*	0.2919*	0.1377*	0.0804	1								
BPSM	0.1	-0.2147*	-0.0907	0.3008*	-0.1372*	-0.2428*	0.074	-0.2568*	1							
CPB	-0.0365	0.0953	-0.0075	-0.3130*	-0.2311*	0.001	0.1311*	0.0394	-0.7540*	1						
Regulated	-0.1626*	0.0524	0.2266*	-0.0998	-0.0448	0.2313*	-0.1385*	0.2751*	-0.1798*	0.1006	1					
SSA	-0.0948	0.2989*	-0.0463	0.1249*	-0.2739*	0.0894	0.1431*	-0.3525*	0.1568*	-0.0033	0.1087	1				
EAP	0.0342	-0.0255	-0.1256*	-0.002	0.0176	0.0639	-0.0282	0.1649*	-0.0025	-0.1154	-0.1627*	-0.0933	1			
EECA	0.1773*	-0.1219*	-0.0709	-0.5089*	0.1960*	0.074	0.0686	0.5357*	-0.5258*	0.5228*	0.3657*	-0.3877*	-0.1512*	1		
MENA	0.0103	-0.1068	-0.0226	0.2012*	-0.1438*	-0.3471*	0.0442	-0.4168*	0.2960*	-0.0817	-0.5941*	-0.2790*	-0.1088	-0.4524*	1	
SA	-0.1717*	-0.0229	0.2465*	0.3230*	0.2053*	0.1910*	-0.2984*	0.0789	0.1933*	-0.5642*	0.1864*	-0.1976*	-0.0771	-0.3203*	-0.2306*	1

* indicates correlation is significant at the 5% level.

The operating expense ratio ranges between (-0.01) to 0.45 and the mean value of 15 percent, reflecting that the sampled institutions have relatively high expenditure to operate their services. On the other hand, the summarized values of financial expenses vary within (-0.01) to 0.14 with the mean of 5 percent, which simply indicates that the sampled MFIs have lower total interest expenses. Furthermore, the average mean of borrower per staff member ratio indicates that each personnel in the sampled MFIs is responsible for nearly 134 borrowers which is quite a lot. However, this ratio in some institutions is beyond normal as shown in the maximum value. Besides, the summarized values of cost per borrower show that although a few MFIs attain cost efficiency as their expense per client is negative, some institutions' expenditure is still very high in this regard. Hence, the average mean of cost per borrower implies that the sampled MFIs spend about US\$ 184 to serve each of their clients which is relatively on the high end.

Apart from that, the summarized values of the regional dummies in the study sample are reasonably balanced across the regions with the possible exception of East Asia and the Pacific. The highest percentage, 38 percent of the MFIs are chosen from Eastern Europe and Central Asia and 25 percent of the institutions are retrieved from the Middle–East and Northern African region. Besides, 19 percent of the firms are extracted from the Sub-Saharan Africa, while MFIs from South Asia comprise 14 percent of the sample. Institutions from East Asia and Pacific share the lowest, only 4 percent of the study sample. Notably, the study considers regional dummies in the empirical estimations to justify the profitability and outreach of MFIs in different geographic contexts.

Table 4 presents the correlations test results between the explanatory predictors. As per the table, many correlations are at a significant level; however, all are less than 0.8. Therefore, no multicollinearity issues have arisen in the models (Kennedy, 2008). Apart from that, the variation inflation factor (VIF) has also observed for all the independent variables and found all VIF values are less than 10, thus the study rules out any problems of multicollinearity (Hair et al., 2010).

4.2 Regression Analysis

Profitability: The empirical models developed earlier have regressed and results from the profitability estimations are presented in Table 5. The findings reveal that as hypothesized, the regulatory status has no significant influence on the institution's profitability. However, a positive association is revealed from the estimation of model 2. This evidence indicates that MFIs can attain financial sustainability whether they are regulated by any authority or free from regulation. Hence, both regulated and unregulated MFIs may earn a positive profit over their loan loss, expense, and other administrative cost. Although a negative relation between regulated MFIs and return on asset is reported in model 4, the coefficient seems very weak and insignificant to be of concern.

The yield or return from loan granted significantly influences both operational self-sufficiency and return on asset. The coefficient implies a logical point that charging high interest rates can increase profitability; however, it may harm other performance, for instance, the social objective. Besides, charging a high interest rate is also not an ethical

Table 5 Profitability estimations of OIC-MFIs

Variables	OSS (1)	OSS (2)	ROA (3)	ROA (4)
Regulated		0.014 (0.083)		-0.003 (0.012)
Yield	2.150*** (0.287)	2.157*** (0.274)	0.394*** (0.053)	0.393*** (0.050)
PAR	-0.553* (0.233)	-0.550* (0.222)	-0.111* (0.043)	-0.111* (0.043)
Size	0.001 (0.011)	0.000 (0.011)	0.001 (0.002)	0.001 (0.002)
Experience	0.128** (0.036)	0.128** (0.037)	0.027** (0.008)	0.027** (0.008)
Inflation	0.008* (0.003)	0.008* (0.004)	0.001 (0.001)	0.001 (0.001)
GDP	-0.002 (0.002)	-0.002 (0.002)	-0.000 (0.001)	-0.000 (0.000)
OE	-3.293*** (0.446)	-3.295*** (0.446)	-0.575** (0.156)	-0.575** (0.154)
FE	-3.728** (0.843)	-3.741** (0.825)	-0.267 (0.161)	-0.264 (0.161)
SSA	-0.157 (0.092)	-0.156 (0.092)	-0.015 (0.016)	-0.015 (0.016)
EAP	-0.003 (0.084)	0.004 (0.097)	0.009 (0.013)	0.008 (0.014)
EECA	0.083 (0.074)	0.082 (0.074)	0.019 (0.014)	0.019 (0.014)
MENA	-0.010 (0.071)	-0.003 (0.088)	0.017 (0.012)	0.015 (0.012)
Constant	0.886** (0.226)	0.881** (0.231)	-0.084 (0.048)	-0.083 (0.048)
R-squared	0.567	0.567	0.570	0.570
Observations	285.000	285.000	285.000	285.000

Note: All estimations have analysed using robust OLS techniques to the general form of cross-sectional and temporal dependency. Size and experience are in natural logarithmic form. Standard Errors are given in the parentheses. Statistically significant at the level where * p<0.10; ** p<0.05 and *** p<0.01.

practice and it may drift MFIs from its original mission of poverty alleviation. Similarly, portfolio at risk is found to be significant across operational self-sufficiency and return on asset, but in a negative manner. Size of MFI is found not to be significantly associated either with operational self-sufficiency or return on asset. However, the experience of MFIs shows significant and positive influence across operational self-sufficiency and return on assets. Evidences indicate that MFIs with more market experience tend to achieve better profitability.

Among the country context variables, the inflation rate has statistically significant effects on operational self-sufficiency, but has no statistically significant effect on return on asset. Conversely, the results found that GDP growth rate has no significant influence on profitability. In addition, results show both operating expenses and financial expenses have significant negative impact on operational self-sufficiency. However, only operating expenses have a significant negative association with the return on asset. Both of these coefficients suggest that profitability can also be achieved by cost efficiency rather than always charging a high interest rate.

Outreach: Findings from the outreach estimations are reported in Table 6. Evidences reveal that, as expected, the regulatory status has no significant effect on the average loan size adjusted by GNI per capita. However, a positive insignificant coefficient was identified from model 6. MFIs should lower their average loan size through outreach to true microfinance clients, the ultra-poor. However, a positive association with the average loan size indicates that regulated MFIs serve wealthier clients among the poor with a larger loan size. Some MFIs may do this to stay in a comfort zone, avoid risk, comply with the stakeholder's decision, and secure profit for investors. Whatever the case, if this phenomenon takes place as found from evidences here, MFIs may drift from their promise of poverty alleviation by creating an impact in the lives of the poorest.

In addition, regulated MFIs are negatively related to the percentage of female borrowers. The coefficient generated from model 8 implies that regulated MFIs are not completely reaching the women clients. This significant negative coefficient also indicates that the regulated MFIs tend to serve some portions of the loan to the male counterpart; however, women are more vulnerable and financially excluded in the society. Percentage of female borrowers is a major proxy in examining the MFIs' outreach to the ultra-poor, serving the poorest portion among the poor. Evidences of this study, however, reflect a scenario where regulated MFIs shift from serving the poorest to the better-off clients. This paradigm of regulated MFIs ignites the concern of mission drift.

The interest rate proxy yield has significant negative relation to the average loan size adjusted by GNI per capita. Charging a high interest rate does not always harm the outreach as the evidence found in this study implies that MFIs may earn more from interest charged and invest that earning to reach the lowest strata of the poor. This coefficient also provides a relief from the mission drift concern. Conversely, the relation between the interest rate charged and the percentage of female borrowers is found to be statistically insignificant. The portfolio at risk ratio is found to be negatively significant across average loan size adjusted by GNI per capita and percentage of female borrowers.

Table 6: Outreach estimations of OIC-MFIs

Variables	ALSG (5)	ALSG (6)	PFB (7)	PFB (8)
Regulated		0.192 (0.162)		-0.154* (0.063)
Yield	-2.234** (0.539)	-2.153** (0.558)	0.314 (0.150)	0.249 (0.153)
PAR	-1.248* (0.542)	-1.238* (0.538)	-0.386** (0.111)	-0.394** (0.111)
Size	0.015 (0.039)	0.006 (0.035)	-0.006 (0.009)	0.000 (0.011)
Experience	-0.035 (0.135)	-0.032 (0.136)	0.010 (0.047)	0.007 (0.051)
Inflation	0.033** (0.010)	0.036** (0.010)	0.004 (0.004)	0.002 (0.005)
GDP	0.033* (0.013)	0.031* (0.013)	0.001 (0.004)	0.003 (0.005)
BPSM	-0.692*** (0.123)	-0.702*** (0.128)	0.021 (0.057)	0.029 (0.057)
CPB	0.191 (0.121)	0.192 (0.118)	-0.170** (0.052)	-0.170** (0.049)
SSA	0.394 (0.277)	0.408 (0.279)	0.116 (0.104)	0.105 (0.100)
EAP	-0.437 (0.333)	-0.361 (0.312)	0.053 (0.070)	-0.007 (0.080)
EECA	-0.286 (0.387)	-0.309 (0.380)	-0.037 (0.110)	-0.019 (0.105)
MENA	-0.144 (0.273)	-0.045 (0.304)	0.023 (0.109)	-0.056 (0.113)
Constant	3.338** (0.976)	3.316** (1.022)	1.272* (0.516)	1.290* (0.505)
R-squared	0.714	0.718	0.646	0.670
Observations	283.000	283.000	283.000	283.000

Note: All estimations have analysed using robust OLS techniques to the general form of cross-sectional and temporal dependency. Size and experience are in natural logarithmic form. Standard Errors are given in the parentheses. Statistically significant at the level where * p<0.10; ** p<0.05 and *** p<0.01.

MFI-size has no significant relation either with an average loan size adjusted by GNI per capita or percentage of female borrowers. The coefficient implies that both large and small MFIs are able to reach out to the ultra-poor in a common ground. A similar relation is also witnessed between MFI-experience with an average loan size adjusted by GNI per capita and percentage of female borrowers. The coefficients of these institutional factors indicate that regardless of being newly established or being experienced with long-term existence, any MFI can serve the lowest strata of the poor by sticking to their mission.

Evidences of country context variables show that both the inflation rate and GDP growth rate have significant positive effects on average loan size adjusted by GNI per capita. Conversely, none of the country context variables have any significant relation with the percentage of female borrowers. In addition, results show a significant negative relationship between borrower per staff member and average loan size adjusted by GNI per capita. The evidence indicates that MFIs with a large number of personnel per client served may lower their average loan size. A similar significant coefficient is also reported for the relationship between cost per borrower and percentage of female borrowers. This result reveals that MFIs may lower their service to women clients when cost per borrower increases, thus, they shift to serve better-off clients.

The regional dummies are included in both the profitability and outreach estimations to explore additional empirical evidence for strong diversification in MFIs' geographic performance. However, the coefficients enumerated in Tables 4 and 5 are not statistically significant. Hence, these dummies seem to be unable to identify reportable evidences across estimations.

5. Conclusion

The study has aimed to expose the influence of regulatory status on the performance of microfinance institutions in the OIC member states. The evidences found in the analysis are as expected, that the regulation has no strong influence on the profitability and outreach indicators, except that it curtails the outreach to female clients. Our evidences from the association between regulation and profitability underline the findings of Hartarska and Nadolnyak (2007); however, Cull et al. (2011) found that regulated MFIs tend to have better profitability.

On the other hand, evidences from the study by Cull et al. (2007) support our findings on the regulatory status impact on the outreach to women clients, but it does not comply with the results of Hartarska and Nadolnyak (2007). Moreover, charging a higher interest rate also promotes an institution's profitability as found in this research. Similar evidences were also reported by Kar and Swain (2014). This study also reveals that a higher interest rate charged may lower the average loan size adjusted by GNI per capita and this evidence supports the findings of Kar (2013).

In addition, the study found no significant impact of MFI-size with the institution's profitability and outreach. In contrast, Cull et al. (2007) found a positive association between the size and profitability, but Kar and Swain (2014) identified negative impacts of the MFI-size on the institution's profitability. Furthermore, there are strong evidences

reported that more market experience is better for profitability and this result supports the findings of Cull et al. (2007). The authors also found similar convincing evidences about the outreach that is not the case in this study.

This study found that only the inflation rate has a significant impact on operational self-sufficiency. On the other hand, average loan size adjusted by GNI per capita may be facilitated by both inflation rate and GDP growth rate. In addition, the results show that portfolio quality, operating expenses, and financial expenses negatively affect the profitability. The portfolio quality also negatively influences the outreach. Results can be summarized as a risky portfolio neither facilitates the profitability nor the outreach. Similarly, MFIs need to manage their cost efficiency in order to be profitable. The results reveal that MFIs may lower their average loan size by GNI per capita by employing a large number of personnel. MFIs need to limit their cost per borrower to avoid serving better-off clients.

Regulation has a wider impact on microfinance performance. Hence, the practical implication is that the findings of this study can assist government authorities to improve the country's regulatory and supervisory framework for financial institutions, particularly for microfinance institutions. The Islamic Development Bank (IsDB), as a development agency for Islamic nations can customize their poverty alleviation projects based on the findings of this study. Since the study reveals that the regulatory status reducing outreach to female borrowers, thus current supervisory body need to revisit the framework and make applicable reforms.

Without empirically examine, which MFIs (regulated or unregulated) perform better in their dual objectives, it is tough to make conclusion in favour or opposite of enforcing regulation for MFIs. After Hartarska and Nadolnyak (2007) and Cull et al. (2011), this is the third such study that primly investigates the issue precisely and contributes on continuous academic argument whether regulated MFIs outperform compare to unregulated MFIs. The findings of this research are consistent with the results of Cull et al. (2011), but contradict with Hartarska and Nadolnyak (2007). All these studies have utilized data from several geographic regions, hence regional or country specific study on this topic might disclose new knowledge.

Notably these results are intuitive from an economic perspective; yet a major limitation of this study is the portion of regulated and unregulated MFIs' data captured in the dataset. The study used a very high volume of regulated MFIs in the sample compared to its counterpart. Hence, it would not be sufficient to make an adequate conclusion in this regard. In addition, our study did not consider the lending techniques and legal status of microfinance institutions; we recommend using those indicators in future research.

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