A Dynamic Analysis of the Performance of Islamic Microfinance Institutions in OIC Countries-The Influence of Digitalization

a Mushtaq Ahmed, b Muhammad Sheharyar, c Faheem Arshad

a Hamdard University Pakistan & IBS, Universiti Utara Malaysia, Malaysia
b PhD Scholar, School of Economics, Finance and Banking, Universiti Utara Malaysia, Malaysia
c PhD Scholar, University Utara Malaysia, Malaysia

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ABSTRACT

The performance of microfinance institutions is debatable. Evidence shows that some microfinance institutions successfully achieve dual objectives, social and financial, while some fail to achieve them. Islamic microfinance institutions (IMFIs) are widely accepted in OIC countries as its products are based on Islamic principles, however its share is very small in the world. Therefore, this study aims to investigate the impact of macroeconomic, macro institutional factors and digitalization on the financial and social performance of Islamic microfinance institutions in OIC countries. Using panel data of 35 Islamic microfinance institutions from 2008 to 2019. The results found that macroeconomics and country-level institutional variables have mixed impact on the performance of Islamic microfinance institutions. In addition, digitization enhances the performance of (IMFIs). The study presents several policy recommendations for improvement in performance.

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Corresponding author’s email address: mushtaq_acca@yahoo.com

1. Introduction

Currently, 3114 MFIs from 103 countries are reported in a worldwide data-based microfinance network: MIX-Market Network. These microfinance providers are recognized as a growing and important niche within the market of financial services specifically for poor people. Regardless of the fact microfinance institution achieve enormous growth of 20% all around the world and mainly in South and East Asia and Africa, the current outreach of microfinance institutions seems below par and insufficient mostly in the countryside/rural areas. Furthermore, some MFIs are incapable of surviving in this industry because of ineffectiveness in their operational activities. Islamic microfinance has approximately 20% of microfinance institutions in OIC countries and in this regard, it is acknowledged that Islamic microfinance has more variety to achieve the same social and financial objectives. In addition, a large number of the Muslim population is concerned about their interest in Islamic microfinance products as these are based on Islamic principles (The...
World Bank, 2013). Islamic microfinance has transformed over the past ten years from a small market to a quickly expanding global industry. Despite its significance, the Islamic microfinance industry only represents less than 1% of worldwide microfinance outreach, therefore it has yet to achieve scale (GIF, 2022). Islamic finance scholars frequently argue that the need for and potential explanation for the success of Shariah-compliant microfinance stems from the religious beliefs of Islamic nations opposing conventional microfinance. However, there is no empirical evidence for this claim in the literature that is currently available on Islamic microfinance (Ashraf and Kabir, 2014). This gap in knowledge limits the ability to develop effective policies and initiatives to support the growth and development of the sector.

MFI success and performance have been inconsistent between nations. Some MFIs have been highly effective in covering their expenses and reaching out to more consumers, but others have not been as successful in reaching out to more people (Ahlin et al., 2011). The performance of microfinance institutions has been a key focus of many studies. Baluku et al. (2019) define the financial performance of MFIs as the capability of the organization to work efficiently in the management of its resources and attain objectives such as profitability and stability. The success of performance in microfinance institutions does not rather involve only the financial performance of MFIs, then also includes social performance such as outreach, which means, reaching the poor in terms of depth and breadth within the country (Ledgerwood, Earne & Nelson, 2013).

In this context, the existing literature for the evaluation of MFI’s performance can be fragmented into two categories. First, studies based on the evaluation of the significance and influence of microfinance assistance on the level of poverty of clientele, such studies are termed demand side or impact studies of microfinance as conducted by (Maitrot & Niño-Zarazúa, 2017; Awaworyi, 2019; Van et al, 2012; Bauchet & Morduch, 2011; Duvendack et al. 2011). These studies employed several estimating techniques to assess the influence of MFIs to achieve the institutional goals of reducing poverty.

Second, studies based on the evaluation of the financial and social performance of MFIs have been known as the supply side of microfinance. Studies in this field focus on both internal and external factors, including internal microfinance institution features (for example amount of total assets for size, number of years from commencement for age, and nature of organization), financial support resources, organizational governance features, profitability, and regularity standing together with external determinants such as cultural, traditional and spiritual diversity (Hartarska, 2005; Hartarska & Nadolnyak, 2007; Awaworyi et al., 2017). These models suggest that different internal and external factors affect the performance of microfinance in a country.

This second stream focuses the level of success of MFIs as external factors, such as GDP, unemployment, inflation, and percentage of domestic credit to describe in what manner the performance of macroeconomic factors affects the MFI performance. In addition, the institutional quality such as corruption, voice and accountability, regulatory quality, rule of law, political stability, and government effectiveness are often used in the study of microfinance institutions at the country-level domain (Awaworyi et al., 2018; Janda & Zetek, 2013; Imai et al., 2012; Ahlin et al., 2011; Gonzalez, 2007; Weiss & Montgomery, 2005; Tucker & Miles, 2004; Patten & Johnston, 2001).

Microfinance institutions often face high operating costs, including administrative expenses, staff salaries, and loan loss provisions. These high costs can limit the ability of microfinance
institutions to reach low-income individuals and communities and provide affordable financial services. Previous studies have shown that high operating costs can limit the sustainability of microfinance institutions and reduce their ability to provide affordable financial services to low-income individuals and communities (Armendariz & Morduch, 2010). This can limit their ability to provide effective financial services and reach those who are most in need. Digitalization can influence MFI’s performance by reducing costs and improving its financial performance. The upholding of financial soundness without the help of donors with sizeable outreach is a big challenge for this sector. Evidence shows that ICT or digitalization has a noteworthy impact in cutting operational expenses, enhancing the marketing of microfinance products, expanding outreach and overall filling the lacunae of financial inclusion. (Das & Laha, 2021; Yadav et al., 2022).

Islamic microfinance, which focuses on providing financial services to low-income individuals and communities under the principles of Islamic finance, has been identified as a promising area for digitalization. Despite the growth of Islamic finance and microfinance in recent years, the adoption of digitalization in the Islamic microfinance sector has been slow (Ali Devi and Bustomi 2020). This has resulted in limited access to financial services for many low-income individuals and communities, especially in rural areas. Furthermore, there is a lack of research that specifically addresses the digitalization of Islamic microfinance and its impact on the accessibility and sustainability of financial services. The use of digital technology in the Islamic finance sector is guided by the principles of Maqasid Al-Shariah, which seeks to promote the common good and prevent harm (Iqbal and Mirakhor, 2013). Digitalization can play a crucial role in facilitating access to financial services for low-income individuals and communities.

This study concentrates on performance of Islamic microfinance institutions in OIC on the following important basis. First, high demand for Islamic microfinance products in these regions (Ashraf and Kabir 2014), second, a large number of poor people are lived in OIC members countries with an inclination towards Islamic principle-based products (Karim et al. 2008; The World Bank, 2013) and third high share of digitalization in the world (Statista 2020). The integration of technology in the Islamic finance sector has brought about innovative solutions that cater to the needs of the unbanked and underbanked population.

2. Literature Review

2.1 Underpinning Theory

This study is based on two separate but interconnected theories to measure the performance of microfinance institutions. The opening underpinning theory is about the market failure theory, a concept that was developed in the 20th century, supported and contributed by many prominent macroeconomists and welfarist of Keynesian schools of thought, named, Arthur C. Pigou, Francis Bator, William Baumol, and Paul A. Samuelson. In unsophisticated words: market failure is the failure of a system or market to reach the optimal level of allocative efficiency. The hypothesis emphasizes that under this assumption market failure is materialized when consumer demand is more than the cost of supplying these goods and services due to an incomplete market. For instance, this type of market failure mostly occurs when the farmer and small businesses face hardship in securing loans and financial services from the financial institution. In respect of the statement, this hypothesis can make a basis for the existence and performance of microfinance institutions. As in developing countries, many people live in the zenith of extreme poverty. As affirmed by Hermes and Lensink (2007) that most poor people can establish their businesses for their livelihood but remain stopped from official financial services because of a deficiency of adequate surety and collaterals and
thus, have no access to credit. In addition, these poor people are less attracted to the formal financial system because of the high cost attached to providing the loan (Perera, 2010). Thus, these deprived people, to overcome financial constraints, turn to the informal sector such as moneylenders, and bear a high rate of interest for borrowing loans (Barr, 2004). That is why, this market failure created by the formal banking system, provides a ground where microfinance institutions perform their services to meet social and financial objectives by offering a different form of financial facilities to unbanked, deprived people (Vanroose & D’Espallier, 2009).

The second theory is known as the microfinance performance theory mostly followed in the assessment of performance in business organizations. This theory proposes that in order to know how much the microfinance institution is successful or failed in achieving their dual objectives, their performance must be scrutinized on some key indicators. These indicators are divided into two main groups concerning social and financial performance. Many authors define performance from a different perspective such as social performance or donation to a charity (Coffey & Wang, 1998) but Heffernan and Flood (2000) define it as company profit. The principal intention of all these studies is to enhance the performance of the organization by using different scope of evaluation.

Microfinance success or failure is not experienced evenly across the world; therefore, studies focus the evaluation of microfinance performance on the way an MFI is organized internally and termed as institutional-specific characteristics which include organizational structures, management techniques, and system of governance. However, Ahlin et al. (2011) and Vanroose and D’Espallier (2009) state besides internal factors, the evaluation of an MFI cannot be accurate and clear without the consideration of the macroeconomic environment where an MFI operates and therefore the value of the macroeconomic atmosphere cannot be ignored. Furthermore, the performance of microfinance institutions in the context of macroeconomic and institutional environments is essential in obtaining the dual objective of the institutions (Sainz-Fernandez et al., 2015). Therefore, this study integrated the above theories to evaluate the impact of macroeconomics and macro-institutional factors and digitalization on performances of Islamic microfinance institutions.

2.2 Inflation and Microfinance Performance

Many economists state inflation as the continuous increase in the price of goods and services in the market during a period. Theoretically, inflation hinders the MFI lending mission. Unanticipated inflation lowers real rates of return for an MFI and increases the number of payments due to interest rates. Similarly, inflation also affects an MFI’s expense to funds, the lender’s incentives for the delay, and the rate of defaults. Scholars like Akerlof et al. (1996) and Rondan, Chavez (2004), Ahlin et al. (2011), Forkusam (2017) and Dholakia, (2020) analyze the effect of inflation in the same manner and explain that a low level of inflation increases the cost of investment and leads to the reallocation of resources. Because, high inflation rates aggravate the resistance on financial markets, by reducing the real yields to savings. Furthermore, restricts investment levels, lowering investment efficiency and hence lessening economic growth. Inflation has a consistently, significantly negative relationship with MFI performance (whether social or financial performance), the results are parallel to the formal banking sector as found by (Boyd et al., 2001).

Scholars including Hartarska and Nadolnyak (2007), Bibi et al. (2018) estimates the double-bottom performances of MIF with macroeconomics variable together with country-level regulatory factors by using data from 114 MFIs from 62 countries. The study uses operation self-sufficiency to investigate the financial performance. The author found that the inflation coefficient has a positive
and significant impact and justifies the estimation on the ground that during inflationary pressure, MFIs develop certain sufficient safeguards to overcome this pressure. The study results are supported by the study of Demirguc-Kunt and Huizinga (1999). However, Awaworyi et al. (2018), Assefa et al. (2013) and Hermes & Lensink, (2011) found that there is no significant effect of inflation on all measures of outreach, however, a significant negative relationship between loan loss rate and positive relation with MFIs yields. Ashim and Ranjula (2014) results show that inflation has a significantly negative relationship with average loan size (depth of outreach) and is insignificant with the number of female borrowers (Breadth of outreach). However, financial performance, measured by FSS and ROA, inflation correlation is significantly positive. Huybens and Smith (1998) conducted the study, and the results posit that the fall in the inflation rates reduced microfinance institutions' revenues, reduced profitability, and then lead to MFI's bankruptcy.

2.3 Private Credit to GDP and Microfinance Performance

Private credit to GDP is the ratio of domestic private credit to the GDP of a country. It is arguably the most common measure of financial development in the finance and growth literature, and it is used as a proxy of the overall financial depth of the country in which the financial institutions operate. Private credit as a percentage of GDP is recognized as the main function of banks and MFIs because it signifies an important financial service provided in developing countries. Thus, a higher level of private credit to GDP shows a high level of financial inclusion. The arguments to maintain the relationship between financial sector development, measured by domestic private to GDP, and the performance of microfinance institutions are based on two theoretical concepts. According to the first concept, microfinance performance and financial development are substitutes for each other. This narrative is supported by market failure theory in which the formal sector is not able to solve the problem of the poor people and therefore allocation of resources is not at the optimal level, which means at the Pareto optimal level. Moreover, the need of microfinance innovations such as group lending in contract, etc., are required to solve the lending constraint to benefit deprived people and reaches more clients, which are believed very risky by banks. (Hallett & Richter, 2004, Demirgüç-Kunt, 2008, Holmstrom & Tirole, 1997; Armendariz & Morduch, 2000, Hermes et al. (2011). The second concept supports the spillover effect of financial development on microfinance performance and therefore, exists a complementary relationship between them. In this situation, MFI funds will be resourced and reinforced from the formal banking system, and hence MFI can provide loans to deprived people (Porteous and Isern, 2005, Ferdousi, 2013). This aforesaid foundation was tested empirically by some scholars, like, Vanroose (2008), and Ahlin and Lin (2006) find that domestic credit has a negative relationship with both measures of microfinance performance. However, Imai et al. (2011) claim that macroeconomic and financial factors development measured by GDP per capita, and share of domestic credit to GDP respectively, have positive influences on profitability, operating expense, and portfolio quality of MFIs. The researcher has found a substantial relationship between financial sector development and microfinance performance. However, the nature of the relationship is unclear with respect to prior and needs further research with a new instrument and methodology to clarify this uncertainty. On this basis of above studies, this study develop hypothesis in relation with macroeconomics environment.

H1: Macroeconomic variables have a significant impact on the social and financial performance of MFIs.

2.4 Macro-institutional Quality and Microfinance Performance

The quality of the country-level institution environment where microfinance institutions exist is a matter of evaluation (Chikalipah, 2017). A weak quality of the institutional environment, such as
lack of customer protection, weak rule of law, corruption in government bureaucracy, an abundance of loan borrowing and loan delinquencies, enormous procedural administration difficulties, fraudulent crime, etc. altogether create an unfavorable business environment for the growth and performance of microfinance industry (Barry & Tacneng, 2014; Schicks, 2013; Ayittey, 2012; Giné & Karlan, 2014). Fisman and Svensson (2007), it is imperative to see how both macroeconomic and country-level institutional factors impact the performance of microfinance. Therefore, he suggests the notion that higher corruption hinders the process of growth of small and medium-sized enterprises throughout the world. Ahlin and Lin (2006) and Fisman and Svensson (2007) on the other hand, opine that corruption may affect lower wages and push more households towards self-employment, and may lead to fostering MFIs borrowers’ growth. So, they suggested that an environment, characterized by high institutional quality is not conducive to microfinance institutions. However, Imai et al., (2011) results show that countries with better institutional quality such as control of corruption, rule of law, and political stability significantly promote efficiency and MFI leverage. Similarly, the measure of stability, accountability and government effectiveness all are significantly associated with the higher operating cost and interest rate components of self-sufficiency set off each other (Ahlin et al.,2011). Therefore, this study tries to find the relationship under the hypothesis.

**H2:** Macro-institutional variables have a significant impact on the social and financial performance of MFIs.

### 2.4 Digitalization and Microfinance performance

MFI needs to decrease the cost of operation, expand outreach potential, improving transparency and efficiency. The pragmatic and feasible solution to achieving these objectives is the adaptation of innovative methods such as digitalization in their operation (Labie & Mersland, 2011). Mobile technology benefits MFIs and borrowers. In their survey-based study, Pytkowska and Korynski (2017) note that digital solutions have helped MFIs in several business procedures. Digital technologies helped financial institutions improve their service delivery and reduce costs (Ivatury, 2009; Lee et al., 2011). Operating costs are a significant factor in the microfinance sector when determining an MFI's lending rate (Dorfleitner et al., 2013). Furthermore, the findings of Dorfleitner and Braun (2019) show that there is an inverse correlation between the adoption of mobile financial services and operational expenditures, the MFI's supply of mobile financial services is favorably correlated with social performance as shown by average loan size. This shows that social missions and digitization may work together. Furthermore, existing studies emphasize the beneficial connection between the use of digital technologies and the administrative skills of financial organizations (Moro & Quirici, 2014; Mora & Prior, 2018). Therefore, including digital solutions in the company model appears to be a potential approach to handle the challenges associated with costs, degree of profitability.

**H3:** Digitalization has a significant impact on the social and financial performance of MFIs.

### 3. Methodology

MFI's performance depends on how well the two objectives are being achieved in terms of social objective and financial objectives. Thus, social objective refers to the inclusion of those people who were excluded in financial access to the formal banking system. While financial objective refers to the sustainability of microfinance institutions in providing financial services. Therefore, these objectives are vital for the success of MFIs (Vishwakarma, 2015; Hartaska, 2005; Hartaska & Nadolnyak, 2007).
3.1 Sources of Data
The data on MFIs derives from the MIX Market (Microfinance Information exchange) (mixmarket.org), an electronic web-based platform for the exchange of data and standards covering MFIs with the main objective to enhance and maintain clarity in the microfinance institution during data collection and analysis. Data related to external governance was taken from the WGI by Kaufmann et al. (2009) that are produced and collected by The World Bank and based on a large extent of a survey taken from citizens and experts in development. The study obtained a final and balanced panel sampling that had 420 observations. These observations represented 35 Islamic microfinance institutions annually for the period from 2008 to 2019.

3.2 Conceptional Framework
With the help of the above theoretical foundation, this study built the following conceptual frameworks.

3.3 The Estimation Model
The objective of the study is to look at how macroeconomic, macro-institutional factors and digitalization affect the performance of Islamic and conventional microfinance institutions. Based on the work of Ahlin et al. (2011) and Awaworyi et al. (2018), the study uses the pooled OLS method for baseline estimation and two-step system GMM to overcome the problem of endogeneity associated with the OLS method.

\[
\text{PERFORMANCE} = \beta_0 + \beta_1 \text{MACROECONOMIC} + \beta_2 \text{MACROINSTITUTIONAL} \\
+ \beta_3 \text{DIGITALIZATION} + \beta_4 \text{SIZE} + \epsilon_{it}
\]

Where PERFORMANCE shows the social and financial performance of Islamic and conventional microfinance institutes in OIC member countries. Furthermore, social performance is measured by the average number of active borrowers and average gross loan size. While the financial performance is measured by operational self-sufficiency and loan loss rate. MACROECONOMIC is a set of explanatory variables that includes some dimensions of macroeconomic indicators, MACROINSTITUTIONAL is a set of explanatory variables including six country-level institutional quality indicators, DIGITALIZATION shows the number of mobile phone
users and SIZE is the institutional-specific controllable variable measured by log value of total assets of each microfinance institution.

3.4 Description of Variables

This study focuses on two dimensions of MFI performance: financial sustainability-or profitability and outreach. The data of these dependent variables derive from MIX Market. Financial sustainability is measured by operational self-sufficiency and is calculated as the total financial revenue divided by financial expense plus net loan loss expense plus operating expense. Whereas outreach is measured as 1) the number of borrowers or the number of active borrowers to measure the breadth of outreach. 2)Average gross loan size measures the outreach depth calculated as the ratio of AGLS to the number of active borrowers. Macroeconomic variables consist of inflation and domestic private credit to GDP. The macro-institutional variable consists of two dimensions from WGI developed six dimensions to measure external governance scoring from -2.5 to +2.5, a higher positive value shows better external governance.

4. Estimation Results

For empirical analysis, the study uses Pooled OLS and a two-step system GMM to investigate the impacts of macroeconomic, macro-institution quality, and digitalization on the performance of Islamic microfinance institutions in OIC member countries. Furthermore, statistical assessments with a theoretical and conceptual discussion of the results are adopted to answer the research hypothesis. In addition to the empirical outcomes, the study incorporated the descriptive statistics of the variables used in the study as well as a diagnostic test for best-fit models.

Table 4.1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>Islamic Microfinance Institutions in OIC countries</td>
<td>420</td>
<td>18</td>
<td>10.112</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>OSS</td>
<td>Financial Revenue / (Financial expense + Loan loss provision expense + Operating expense)</td>
<td>420</td>
<td>115.962</td>
<td>70.027</td>
<td>-198.907</td>
<td>434.43</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer Price Inflation</td>
<td>420</td>
<td>138.578</td>
<td>110.308</td>
<td>77.91</td>
<td>1344.193</td>
</tr>
<tr>
<td>DCPS</td>
<td>Domestic Credit to Private Sector (% GDP)</td>
<td>420</td>
<td>25.144</td>
<td>21.078</td>
<td>2.682</td>
<td>109.713</td>
</tr>
<tr>
<td>GE</td>
<td>Index: Government Efficiency (-2.5 to 2.5; WGI)</td>
<td>420</td>
<td>-0.807</td>
<td>0.55</td>
<td>-2.279</td>
<td>0.236</td>
</tr>
<tr>
<td>RoL</td>
<td>Index: Rule of Law (-2.5 to 2.5; WGI)</td>
<td>420</td>
<td>-0.871</td>
<td>0.561</td>
<td>-2.092</td>
<td>0.464</td>
</tr>
<tr>
<td>ITU</td>
<td>Number of Mobile users in 1000 individuals.</td>
<td>420</td>
<td>28.575</td>
<td>24.944</td>
<td>1</td>
<td>100.165</td>
</tr>
<tr>
<td>Log TA</td>
<td>Log (Total Assets)</td>
<td>418</td>
<td>16.121</td>
<td>1.879</td>
<td>10.774</td>
<td>19.733</td>
</tr>
<tr>
<td>LogANAB</td>
<td>Log (in year-end Number of Active Borrowers)</td>
<td>418</td>
<td>9.5</td>
<td>1.806</td>
<td>4.956</td>
<td>13.784</td>
</tr>
<tr>
<td>LogAGLS</td>
<td>Log (Average gross loan portfolio / Average number of active borrowers)</td>
<td>418</td>
<td>6.28</td>
<td>1.116</td>
<td>3.765</td>
<td>8.862</td>
</tr>
</tbody>
</table>

Note: AGLS = Average Gross Loan Size; ANAB = Average Number of Active Borrowers; OSS (%) = Operational Self-Sufficiency (%); LTA = Log Value of Total Assets; CPI = Consumer Price Index; DCPS= Rate of Domestic Credit to Private; GE = Government Efficiency (Index); RoL = Rule of Law; ITU = Number of Mobile users out of hundred Individual
The consumer price index (CPI) is a measure of a country's inflation, ranging from a minimum of 77.91 to a maximum of 1344.19 with a mean of 138.57 and a standard deviation of 110.30. The domestic credit to the private sector (DCPS) has a mean value of 25.143 % of GDP and its standard deviation is 21.07 % for all the countries. The maximum value of DCPS of 109.71 % and the minimum value of 2.682 %.

The government efficiency (GE) has a mean value of -0.81 points and its standard deviation is 0.55 points for all the countries. The maximum value of GE 0.24 points is reported whereas, the minimum value is -2.27 points. The value of rules of law (RoL) ranges from a minimum of -2.092 points to a maximum of 0.464 points with a mean of -0.871 and a standard deviation of 0.561. The internet user per hundred people (ITU) has a mean value of 28.57 per person for all the samples and its standard deviation is 24.94. The maximum value of the internet is 100 users while the minimum value of 1 user per hundred people.

The log value of total assets (TA) ranges from a minimum of 10.774 to a maximum of 19.733 with a mean of 16.121 million and a standard deviation of 1.879. The log value of the number of active borrowers (ANAB) has a mean value is 9.5 and a standard deviation is 1.806. The maximum value is 13.784, however, the minimum value is 4.956. The log average gross loan size (LAGLS) has a mean value of 6.28 its standard deviation is 1.116. The maximum value of the LAGLS of 8.862 while, the minimum value of 3.765 million.

### Table 4.2: Matrix of correlations and Variance inflation factor

<table>
<thead>
<tr>
<th>Variables</th>
<th>VIF</th>
<th>CPI</th>
<th>DCPS</th>
<th>GE</th>
<th>RoL</th>
<th>ITU</th>
<th>LTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI</td>
<td>1.163</td>
<td>-0.148</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCPS</td>
<td>2.321</td>
<td>-0.148</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE</td>
<td>6.491</td>
<td>-0.281</td>
<td>0.674</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RoL</td>
<td>6.169</td>
<td>-0.139</td>
<td>0.684</td>
<td>0.883</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITU</td>
<td>1.55</td>
<td>-0.007</td>
<td>0.456</td>
<td>0.211</td>
<td>0.396</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>LTA</td>
<td>1.078</td>
<td>0.104</td>
<td>0.127</td>
<td>-0.048</td>
<td>0.041</td>
<td>0.178</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: CPI = Consumer Price Index; DCPS= Rate of Domestic Credit to Private Sectors (%); GE = Government Efficiency (Index); RoL = Rule of Law; ITU = Number of Mobile users out of hundred Individual; LTA = Log Value of Total Assets

The table shows that each explained variable follows the benchmark of less than 0.8% correlation as well as all VIF values are within the threshold level of 10.

### Table 4.3: Estimation Results-Pooled OLS

<table>
<thead>
<tr>
<th></th>
<th>LAGLS</th>
<th></th>
<th>LANAB</th>
<th></th>
<th>OSS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>Sig</td>
<td>p-value</td>
<td>Coef.</td>
<td>Sig</td>
<td>p-value</td>
</tr>
<tr>
<td>CPI</td>
<td>-0.001</td>
<td>**</td>
<td>0.025</td>
<td>CPI</td>
<td>0.001</td>
<td>***</td>
</tr>
<tr>
<td>DCPS</td>
<td>-0.015</td>
<td>***</td>
<td>0.000</td>
<td>DCPS</td>
<td>0.018</td>
<td>***</td>
</tr>
<tr>
<td>GE</td>
<td>0.262</td>
<td>0.185</td>
<td></td>
<td>GE</td>
<td>-0.129</td>
<td>0.543</td>
</tr>
<tr>
<td>RoL</td>
<td>0.054</td>
<td>0.774</td>
<td></td>
<td>RoL</td>
<td>-0.034</td>
<td>0.865</td>
</tr>
<tr>
<td>ITU</td>
<td>0.027</td>
<td>***</td>
<td>0.000</td>
<td>ITU</td>
<td>-0.027</td>
<td>***</td>
</tr>
<tr>
<td>LTA</td>
<td>0.152</td>
<td>***</td>
<td>0.000</td>
<td>LTA</td>
<td>0.791</td>
<td>***</td>
</tr>
<tr>
<td>Constant</td>
<td>3.844</td>
<td>***</td>
<td>0.000</td>
<td>Constant</td>
<td>-3.23</td>
<td>***</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.397</td>
<td>No.of obs</td>
<td>418</td>
<td>R-squared</td>
<td>0.737</td>
<td>No.of obs</td>
</tr>
<tr>
<td>F-test</td>
<td>45.06</td>
<td>Prob&gt;F</td>
<td>0.000</td>
<td>F-test</td>
<td>191.748</td>
<td>Prob&gt;F</td>
</tr>
</tbody>
</table>

*** p<.01, ** p<.05, * p<.1
Table 4.3 shows the estimation results of three models which are used to answer the research hypothesis of the study. The coefficient of the CPI is negatively significant with LAGLS while positively significant with LANAB and OSS with mostly similar magnitude and degree of significance of the coefficient. The significant negative magnitude with LAGLS indicates high inflation hampers the outreach of microfinance institutions to the poorest of the poor. This result is supported by Ahlin et al. (2011) as well as Martins and Winkler (2013) conventions that inflation has a bad impact on the lending objective of MIFs for social performance. The result of LANAB indicates that as inflation increase the supply of microcredit also increase and the services of microfinance institution reach many poor applicants during high inflation. In the line with this statement, Vanroose and D’Espallier (2009) advocate that MFI are more lucrative and have higher outreach levels in countries that do not hurt by high inflation rates. In addition to this Cull and Morduch (2018) found that inflation was associated with a higher percentage of outreach. The significant positive magnitude of OSS indicates that in high inflation the revenue over cost increases as most of the unbanked people can get financial assistance from IMFIs during high as a lender of last resort. The coefficient of DCPS as a proxy of financial sector development shows a negatively significant correlation with LAGLS, positively significant with LANAB and insignificant with OSS. Studies related to financial sector development indicate both positive and negative impacts of financial sector development on the performance of microfinance institutions. Here, the result of this study supports both rivalry and the positive spillover effect of formal financial sector development as reported in the studies of Hassan et al. (2011). The result of CPI and DCPS justify the first hypothesis that macroeconomic variables, the CPI and DCPS have a significant impact on both the social and financial performance of IMFIs. The coefficient of GE shows a positively significant correlation with OSS. The result poses boosting effect of GE on operational self-sufficiency. This result is justified by the finding of Imai et al. (2011) as a country with better institutional quality promotes efficiency and MFI leverage. The coefficient of RoL shows a negatively significant relationship with OSS. The negative magnitude indicates that a higher level of RoL by the government produce a negative impact on the operational performance of microfinance institution especially in Islamic institution this is due to the informal nature of the financial institution. It has been observed that microfinance institution is an informal organization by nature, therefore, increase in RoL hinders the way of doing operation of microfinance institutions. Ahlin et al. (2011) derive an interesting conclusion from the estimation that control of corruption act as a barrier to MFI endeavors. The coefficient ITU shows a positively significant relationship with AGLS. The positive magnitude of the coefficient indicates that an increase in the use of digitalization increases the average gross loan size implying that the size of the loan reduces from a larger amount to a smaller amount which leads to greater penetration of loans in society. In addition, a greater number of poor people are benefitted from the smaller size of the loan and hence it helps in achieving the social objective of microfinance. This result supports the statement of the United Nations (2016) that financial inclusion is a sustainable provision that brings the poor into the formal economy with the help of affordable financial services and also with CGAP (2015) that with the help of digital finance small size of the loan is provided to the excluded and underserved population. However, the coefficient is negatively significant with the average number of active borrowers, a measure of the outreach breadth of microfinance institutions. The result may be explained by the argument that Islamic microfinance customers are less aware of mobile services provided by institutions. Furthermore, there is an insignificant relationship between digitalization with OSS. The coefficient of LTA shows a positively significant relationship in all three models of the data sets. These results are consistent with Chandler (1962), Kipesha and Zhang (2013) and Ahlin et al. (2011) that firm size has a significant impact on the performance of microfinance institutions pertinent to its efficiency, outreach, sustainability as well earning capacity of the institution.
Table 4.4: Estimation Results—System GMM

<table>
<thead>
<tr>
<th>LAGLS</th>
<th>Coef.</th>
<th>Sig</th>
<th>p-value</th>
<th>LANAB</th>
<th>Coef.</th>
<th>Sig</th>
<th>p-value</th>
<th>OSS</th>
<th>Coef.</th>
<th>Sig</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lag AGLS</td>
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<td>0.772</td>
<td></td>
<td>Lag ANAB</td>
<td>-0.04</td>
<td>*</td>
<td></td>
<td>Lag OSS</td>
<td>-0.199</td>
<td>0.238</td>
<td></td>
</tr>
<tr>
<td>CPI</td>
<td>0.003</td>
<td>0.799</td>
<td></td>
<td>CPI</td>
<td>-0.001</td>
<td>*</td>
<td></td>
<td>CPI</td>
<td>0.122</td>
<td>***</td>
<td>0.009</td>
</tr>
<tr>
<td>DCPS</td>
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<td>***</td>
<td>0.000</td>
<td>DCPS</td>
<td>0.014</td>
<td>***</td>
<td>0.000</td>
<td>DCPS</td>
<td>-0.224</td>
<td>0.668</td>
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</tr>
<tr>
<td>GE</td>
<td>0.401</td>
<td>0.313</td>
<td></td>
<td>GE</td>
<td>-0.839</td>
<td>***</td>
<td>0.000</td>
<td>GE</td>
<td>30.942</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td>RoL</td>
<td>0.547</td>
<td>0.105</td>
<td></td>
<td>RoL</td>
<td>0.902</td>
<td>***</td>
<td>0.000</td>
<td>RoL</td>
<td>12.849</td>
<td>0.851</td>
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<tr>
<td>ITU</td>
<td>0.036</td>
<td>***</td>
<td>0.000</td>
<td>ITU</td>
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<td>***</td>
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<td>ITU</td>
<td>0.094</td>
<td>0.691</td>
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</tr>
<tr>
<td>LTA</td>
<td>0.265</td>
<td>***</td>
<td>0.000</td>
<td>LTA</td>
<td>0.669</td>
<td>***</td>
<td>0.000</td>
<td>LTA</td>
<td>6.445</td>
<td>**</td>
<td>0.044</td>
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</table>

<table>
<thead>
<tr>
<th>Sargan-test</th>
<th>Sargan-test</th>
<th>Sargan-test</th>
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</thead>
<tbody>
<tr>
<td>chi2(360) = 11.2699</td>
<td>Prob &gt; chi2 = 1.0000</td>
<td>chi2(360) = 11.95656</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Arellano-Bond-test</th>
<th>Arellano-Bond-test</th>
<th>Arellano-Bond-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>z</td>
<td>Prob</td>
<td>AR(1)</td>
</tr>
<tr>
<td>AR(2)</td>
<td>-0.105</td>
<td>0.917</td>
</tr>
</tbody>
</table>

Number of obs 406 Number of obs 406 Number of obs 406

*** p<.01, ** p<.05, * p<.1

Reverse causation is not a likely problem in this study because, intuitively, the success of performance MFI variables are unlikely to affect the country-level variables used in this study. As a result, reverse causation does not generate worries about endogeneity. However, if unobservable factors are correlated with dimensions of MFI performance and macroeconomic variables, endogeneity may be a problem. As a consequence, the study used generalized method of moments (GMM) approach to guarantee that our findings are robust to endogeneity. The technique is based on data heteroscedasticity and has been extensively used in the papers for robustness checks (Awaworyi et al., 2019; Belfield and Kelly 2012; Emran and Shilpi 2012; Mishra and Smyth 2015). The study follows Arellano and Bond (1991) and use the lagged levels of the explanatory factors as tools to handle endogeneity. We adopted the GMM-SYS and conducted regressions using the two-step estimator consistent with (Roodman 2006; Blundell and Bond 1998), based on reasoning pointing to the efficacy of system GMM (GMM-SYS) over first difference GMM (GMM-DIFF). The coefficient of the lag dependent variable is only negatively significant in LANAB indicates this variable is also influenced with own previous values while the lag dependent variable of LAGLS and OSS is insignificant. CPI is negatively significant with LANAB, this result is otherwise as shown in Pooled OLS and insignificant with LAGLS and OSS. The coefficient of DCPS as a proxy of financial sector development shows similar correlation as in Pooled OLS. The coefficient of GE shows a negatively significant correlation with LANAB and insignificant with LAGLS and OSS. The coefficient RoL shows a positively significant correlation with LANAB and insignificant with LAGLS and OSS. These results
of institutional quality are similar in direction with the Pooled OLS estimation together with some deviation in degree of significance. The coefficient ITU shows a similar result as comes out in Pooled OLS indicate the importance of digitalization in IMFIS activities. The coefficient of LTA shows a positively significant relationship in all three models of the data sets and is justified by previous estimation.

5. Conclusion

The results show that the coefficient of the consumer price index (CPI) is positively significant with average number of active borrowers, the increase in inflation does not impede the expansion of microfinance outreach because the need for the fund is more in high inflation in developing countries, and monetary return becomes lucrative to lending institutions. It is concluded that the rise in inflation is not hinder the expansion of outreach of microfinance institutions. That is why many microfinance institutions are found in developing economies. In addition, the results show that (DCPS) as a proxy of financial sector development is negatively significant with LAGLS and positively significant with LANAB in Islamic microfinance institutions. The result concludes that financial sector development helps reach microfinance services to the poorest of the community. Financial sector development creates a spillover effect on microfinance institutions, enhancing the breadth and depth of outreach and, therefore, the poor benefit from microfinance services. These macroeconomic factors justify the first hypothesis of the study.

The GE shows negatively significant relationship with the average number of active borrowers and positively significant with OSS. The coefficient of RoL has a significant positive association with an average number of active borrowers. From this external governance perspective, GE and RoL and promote the breadth of outreach and OSS, which means microfinance performance flourishes in good external governance.

For LAGLS, the results show that the coefficient of digitalization has a positively correlation with a measure of outreach of microfinance institutions. The results conclude that the magnitude and high significance level indicate the importance of digitalization for expanding microfinance services for poor and unbanked people of a country. Furthermore, the inclusion of digitalization in microfinance leads to help in the achievement of MDGs of the United Nations goals. However, with LANAB result shows a negatively significant relation. In relation OSS, the result shows that digitalization (ITU) has a positively significant relationship with operational self-sufficiency which helps in reducing the cost of IMFIs of operation.

The main contribution of the study, the finding of country-level impact on IMFIs performance as well as study provides the solution to avoid mission drift by using the proxy of innovation such as digitalization.

6. Policy Implication

The result concludes that the consumer price index (CPI) significantly positively impacts the average number of active borrowers of the data set’s Islamic, conventional microfinance, and combined microfinance institutions. This implies that policymakers of both microfinance institutions can advertise products in their country to attract more borrowers for microfinance services. However, the consumer price index significantly negatively affects average gross loan size due to the decline in the customer’s purchasing power. To overcome high inflation pressure, the policy maker of Islamic microfinance institutions should adopt the strict and conservative method of providing
loans to borrowers to prevent the institution from bad debt provisions. The result of domestic credit to the private sector is significantly positive, with LANAB in Islamic microfinance. This result implies that with the development of the formal banking sector, the growth in conventional microfinance institution is also taken place, as both are supposed to be supportive of each other due to the spillover effect of the formal banking sector. In this line, the policymaker can receive additional funds from the banks. It is potentially insightful into the workings of microfinance to see how institutional outcomes affect an MFI’s operation. The governance indicator such as GE positively affects OSS which implies that improvement in the efficiency the operational self-sufficiency of Islamic microfinance institutions. The result of RoL has a significant favorable effect on the average number of active borrowers, a measure of outreach breadth. Microfinance performances flourish where the country is embraced with political stability. Digitalization has a positively significant relationship with the with average gross loan size. These results omen a good sign for policy maker to promote financial performance to meet some of the millennium development goals (MDGs). It also controls or prevents the mission drift phenomenon from the social objective of the microfinance institutions as well. Furthermore, digitalization has a positive relationship with operational self-sufficiency, indicating a healthy sign for operational activities.

7. Limitation

This study covers 2008-2019 years of data and focuses on two dimensions of social performance, breadth, and depth of outreach, measured traditionally, such as the average number of active borrowers and average loan portfolio size. In addition to social performance, financial performance is measured by operational self-sufficiency for Islamic microfinance institutions in OIC member countries. Some other variables can be used instead of this study. But this limitation may provide a new dimension that may be used in the future to evaluate the performance of the Islamic microfinance institution more robustly. Focusing further on performing comparison studies, comparing the performances of IMFIs in various locations is another intriguing area for future research or countries with different income levels as prescribed by the World Bank. This enables comparisons between the performance of IMFIs in regions with robust and effective microfinance sectors and those with underperforming microfinance sectors. Through these comparisons, poor performers of IMFIs may learn from successful IMFIs' experiences at both the IMFI and regional levels, as well as make conclusions about how to enhance and improve their performance by using some of the tactics used by successful IMFIs and regions. Finally, it is advised that rather than eradicating these IMFI types, future research should look into the possibility of a trade-off between MFI profitability and other outreach factors, such as the scope of outreach and cost to clients.

References


GIFF. (2022). Global Islamic Finance Forum


