Palacký University Olomouc
University of Clermont Auvergne
University of Pavia

MASTER THESIS

Mission Drift in the Middle East & North Africa: The Effect of the Financial Sustainability of Microfinance Institutions on their Depth of Outreach to the Poor

Patrick C.J. Ferrity

Supervisors:
Prof. Fouzi Mourji (University of Hassan II Casablanca)
Mgr. Martin Schlossarek, Ph.D (Palacký University Olomouc)

GLODEP 2020

Mission Drift in the Middle East & North Africa: The Effect of the Financial Sustainability of Microfinance Institutions on their Depth of Outreach to the Poor

Submitted by

Patrick C.J. Ferrity

Erasmus Mundus Joint Master's Degree in International Development Studies
(GLODEP 2018-2020)

Supervised by

Fouzi Mourji
Professor of Econometrics
University of Hassan II Casablanca

&

Mgr. Martin Schlossarek, Ph.D
Assistant Lecturer
Faculty of Science
Palacký University Olomouc

Date of Submission: 7 May 2020

GLODEP 2020

Declaration

I, Patrick C.J. Ferrity, hereby declare that this Master thesis entitled “Mission Drift in the Middle East & North Africa: The Effect of Financial Sustainability on the Depth of Outreach of Microfinance Institutions” was carried out by me for the Erasmus Mundus Joint Master’s degree in International Development Studies under the guidance and supervision of Professor Fouzi Mourji, University of Hassan II Casablanca/LASAARE (Laboratoire de Statistique Appliquée à l'Analyse et la Recherche en Économie), and Mgr. Martin Schlossarek, Ph.D, Palacký University Olomouc. I confirm that the work contained herein is my own, except where explicitly stated otherwise in the text through reference, citation or acknowledgement. This work has not been published as of and from before this date, and has not been submitted for any other degree or qualification except as specified.

Signature:

Date: June 7th, 2020

UNIVERZITA PALACKÉHO V OLOMOUCI

Přírodovědecká fakulta

Akademický rok: 2019/2020

ZADÁNÍ DIPLOMOVÉ PRÁCE

(projektu, uměleckého díla, uměleckého výkonu)

Jméno a příjmení:	**Patrick Christopher FERRITY**
Osobní číslo:	**R180104**
Studijní program:	**N1301 Geography**
Studijní obor:	**International Development Studies**
Téma práce:	**Microfinance Services & Development**
Zadávající katedra:	**Katedra rozvojových a environmentálních studií**

Zásady pro vypracování

An analysis of microfinance services and the use of targeting tools in order to expand the depth and breadth of MFI services to the most poor. This research will focus in particular on the use of microinsurance as an MFI service. Furthermore, this research will also take into account the evolution of loan amounts, activity size, gender of the client, the sector of activity and the use of individual loans or guaranty group solidarity. Finally, this research will analyze data at the level of branches and study their viability according to different variables, such as staff, services provided, regions, and rural – urban comparison.

Rozsah pracovní zprávy:	
Rozsah grafických prací:	
Forma zpracování diplomové práce:	**tištěná**
Jazyk zpracování:	**Angličtina**

Seznam doporučené literatury:

Fletschner, D. & amp; Kenney, L. (2014). Rural women? S access to financial services: credit, savings, and insurance. In *Gender in Agriculture* (pp. 187-208). Springer, Dordrecht.

Greeley, M. (2003). Part I: Microfinance and Poverty 1. Poverty Reduction and Microfinance?Assessing Performance.

Littlefield, E., Morduch, J., & Hashemi, S. (2003). Is microfinance an effective strategy to reach the millennium development goals?. *Focus note*, *24*(2003), 1-11.

Maleika, M., & Kuriakose, A. T. (2008). Microinsurance: extending pro-poor risk management through the social fund platform.

Mourji, F. (2000). Impact Study of the Zakoura Microcredit Program. *Microstart, UNCDF, New York, USA*.

Schreiner, M. (2002). Aspects of outreach: A framework for discussion of the social benefits of microfinance. *Journal of international development*, *14*(5), 591-603.

Simanowitz, A. (2003). *Appraising the poverty outreach of microfinance: A review of the cgap poverty assessment tool (PAT)* (No. 1762-2016-141571).

Simanowitz, A. (2003). Microfinance, poverty and social performance.

Weber, O. & Ahmad, A. (2014). Empowerment through microfinance: The relationship between the loan cycle and the level of empowerment. *World Development* , *62* , 75-87.

Vedoucí diplomové práce: **Mgr. Martin Schlossarek, Ph.D.**
Katedra rozvojových a environmentálních studií

Datum zadání diplomové práce: **3. února 2020**
Termín odevzdání diplomové práce: **22. května 2020**

L.S.

doc. RNDr. Martin Kubala, Ph.D.
děkan

doc. RNDr. Pavel Nováček, CSc.
vedoucí katedry

V Olomouci dne 3. února 2020

Acknowledgments

C. S. Lewis *"Nothing that you have not given away will ever truly be yours."*

I would like to dedicate this work to my family, my mother and father, Oonagh and Patrick Sr., to my sisters, Catherine and Sara, to my younger brother Ben, and to my brothers-in-law, Nicholas and Omar. I love you all to the moon and back. I would also like to thank my friends that I have been blessed to meet over the years, in particular to those within GLODEP, thank you for two incredible years together. You were always there for me through the good times and bad times, and it is an honour to call you all friends.

I would like to express my thanks to my co-supervisors. Professor Fouzi Mourji, thank you for your guidance and support, and for being a mentor to me these past months, both professionally and academically. I greatly appreciate the opportunity to work for LASAARE and have learnt a great deal. It was through your classes in Clermont Auvergne University that inspired my passion for microfinance in the developing world. I have nothing but the utmost respect for your achievements and I will cherish our time together.
I would also like to thank Dr. Martin Schlossarek, another pioneer of microfinance, who also played a big part in inspiring this research. Thank you for the advice and assistance you provided me with for the qualitative part of this research.

To Dr. Meriem Oudmane, of Hassan II University, Casablanca, thank you for your assistance with the quantitative methods of this research, for always being available when I needed you, and for the kindness and patience you have always shown me.

Finally, I would like to thank Erasmus Mundus Joint Master's Degree GLODEP Consortium, for the tireless work, effort and time you have put into this programme, I only hope that we have done you proud.

My sincerest gratitude to all of you,

Patrick

Abstract

The objective of this study is to analyse mission drift among microfinance institutions (MFIs) in the Middle East and North Africa (MENA). Mission drift occurs when MFIs focus more on financial sustainability (financial objective) instead of depth of outreach to poor borrowers (social objective). This study uses a panel dataset, representing a sample of 52 MFIs from 10 countries across the region, from 2008-2017. It implements fixed and random effects estimations on two dynamic models. Findings of this study show that the provision of larger loans to the poor (evidence of mission drift) in the MENA region is strongly associated with better financial self-sustainability and efficiency, especially considering higher portfolio quality, but this comes with higher costs per borrower and lower profits. In addition, shows that MFIs with a higher percentage of female borrowers generally are more operationally self-sustainable and efficient, requiring fewer employees to produce a given number of borrowers. Therefore, this study reveals conflicting evidence as to whether MFIs in the region experience mission drift. Future policy efforts should prioritize technological advances to increase outreach, enabling regulations that allow a variety of types of MFIs to exist, and the diversification products (savings, micro-insurance, Islamic, etc).

Keywords: Microfinance; Poverty Alleviation; Financial Sustainability; Depth of Outreach; Middle East & North Africa; Financial Inclusion

CHAPTER I: INTRODUCTION

1. Introduction.....1
    1.1. Background: Microfinance & Poverty
    1.2. Policy Context: Financial Exclusion and Microfinance in the Middle East & North Africa
    1.3. Purpose of Study
    1.4. Significance of the Study
    1.5. Scope, Assumptions, and Limitations of the Study
    1.6. Outline of Chapters

CHAPTER II: LITERATURE REVIEW

2. Literature Review……10
    2.1. Review of the Theoretical Literature
        2.1.1. Conceptual Framework for Microfinance
        2.1.2. The Double Bottom Line: A Win-Win Proposition
        2.1.3. The Meaning & Concept of Outreach in Microfinance
        2.1.4. Female Empowerment & Microfinance
        2.1.5. MFI Path to Financial Sustainability
        2.1.6. The Commercialisation & Regulation of Microfinance
        2.1.7. Welfarist vs. Institutionalist Approaches
    2.2. Review of the Empirical Literature
        2.2.1. Review of Cross-Country Studies on Mission Drift
        2.2.2. Review of MENA Studies on Mission Drift
    2.3. Existing Literature Gap
    2.4. Review of the Methodologies Adopted in the Literature
        2.4.1. Studies on the Identification of Determinants of Mission Drift
        2.4.2. Studies Based on Fixed & Random Effects Estimations

CHAPTER III: METHODOLOGY

3. Methodology……27
    3.1. Analytical Framework for Mission Drift
    3.2. Description of the Data
        3.2.1. Source of Data & Sample Design
        3.2.2. Selection of Dependent & Independent Variables
    3.3. Econometric Framework
        3.3.1. Implementation of Models using Panel Data
        3.3.2. Implementation of the Pooled OLS Regressions
        3.3.3. Implementation of Fixed Effects Estimations
        3.3.4. Implementation of Random Effects Estimations
        3.3.5. Econometric Modelling for the Study
        3.3.6. Key Assumptions
        3.3.7. Limitations of the Study
    3.4. Stata Implementation

CHAPTER IV: RESULTS & DISCUSSION

4. Results & Discussion…….41
   4.1. Descriptive Statistics
   4.2. Random Effects Estimation Results (Model 1)
   4.3. Fixed Effects Estimation Results (Model 2)
   4.4. Robustness Checks

CHAPTER V: CONCLUSIONS & RECOMMENDATIONS

5. Conclusions & Recommendations.....51
   5.1. Conclusions
   5.2. Recommendations

REFERENCES…….54
FIGURES……...……..64

Figure 1: Number of Poor by Region, 1990–2030
Figure 2: Share of poor people in the world by region or country, 2015
Figure 3: Extreme poverty rates at $1.90 (2011 PPP) line across regions in 2011 and 2015, (%)
Figure 4: Extreme poverty rates and absolute number of extreme poor at $1.90 (2011 PPP) line in MENA
Figure 5: Youth Unemployment Rates by Country (MENA)
Figure 6: Conceptual Framework of Microfinance
Figure 7: Analytical Framework for Mission Drift
Figure 8: Distribution of Average Loan per Borrower for each MFI (Model 1), 2008-2017
Figure 9: Distribution of Percentage of Female Borrowers for each MFI (Model 2), 2008-2017
Figure 10: Histograms comparing the distribution of the dependent variables: LNBB & FMPWR
Figure 11: Fixed Effects Model 1 (Average Loan per Borrower) - Heterogeneity Across MFIs (or entities)
Figure 12: Fixed Effects Model 1 (Average Loan per Borrower) - Heterogeneity Across Years
Figure 13: Fixed Effects Model 2 (Percentage of Female Borrowers) - Heterogeneity across MFIs (or entities)
Figure 14: Fixed Effects Model 2 (Percentage of Female Borrowers) - Heterogeneity Across Years

APPENDICES…….74

Appendix 1: Pooled OLS Regression – Model 1 (Average Loan per Borower)
Appendix 2: Fixed Effects Estimation – Model 1 (Average Loan per Borower)

Appendix 3: Random Effects Estimation – Model 1 (Average Loan per Borower)
Appendix 4: Hausman Test – Model 1 (Average Loan per Borrower)
Appendix 5: Testing for Random Effects with Breusch-Pagan Lagrange Multiplier (LM) – Model 1
Appendix 6: Random Effects Estimation – Model 1 (Average Loan per Borrower) - Robust
Appendix 7: Pooled OLS Regression – Model 2 (Percentage of Female Borrowers)
Appendix 8: Fixed Effects Estimation – Model 2 (Percentage of Female Borrowers)
Appendix 9: Random Effects Estimation – Model 2 (Percentage of Female Borrowers)
Appendix 10: Hausman Test – Model 2 (Percentage of Female Borrowers)
Appendix 11: Test for Time-Fixed Effects – Model 2 (Percentage of Female Borrowers)
Appendix 12: Wald test for Time-Fixed Effects – Model 2 (Percentage of Female Borrowers)
Appendix 13: Modified Wald Test for Groupwise Heteroskedasticity in Fixed Effect Regression – Model 2
Appendix 14: Fixed Effects Estimation – Model 2 (Percentage of Female Borrowers) with Robust/Clustered Standard Errors
Appendix 15: Fixed Effects Estimation – Model 2 (Percentage of Female Borrowers), Logs of the Lagged Explanatory Variables

LIST OF TABLES

Table 1: Summary of the Major Cross-Country & Regional Empirical Literature on Mission Drift……22
Table 2: Evidence of Relationship between Explanatory Variables and the Dependent Variables (Average Loan per Borrower & Percentage of Female Borrowers).31
Table 3: Description of Dependent & Explanatory Variables……..34
Table 4: Summary statistics of the dependent variable, average loan per borrower, at the MFI level…….43
Table 5: Summary statistics of the dependent variable, percentage of female borrowers, at the MFI level……...43
Table 6: Descriptive Statistics for the Explanatory Variables (Detailed)…….45

LIST OF ABBREVIATIONS

2SLS: Two-Stage Least Squares
ACBR: Number of Active Borrowers
BRWRST: Borrowers per Staff Member
CGAP: Consultative Group to Assist the Poor
CTBR: Cost per Borrower
DTEQ: Debt-to-Equity Ratio
EC3SLS: Error Component Three Stage Least Squares
FAO: Food and Agriculture Organization
FE: Fixed Effects
FE3SLS: Three Stage Least Squares with Fixed Effects
FGLS: Feasible Generalized Least Squares
FINCA: Foundation for International Community Assistance
FMPWR: Percentage of Female Borrowers
GLS: Generalized Least Squares
GMM: Generalized Method of Moments
GRLN: Gross Loan Portfolio
HSBC: Hongkong and Shanghai Banking Corporation
IID: Independent and Identically Distributed
LASAARE: Laboratoire de Statistique Appliquée à l'Analyse et la Recherche en Économie:
LM: Breusch-Pagan Lagrange Multiplier
LNBB: Average Loan Size per Borrower
LNLR: Loan Loss Reserve Ratio
MENA: Middle East and North Africa
MFI: Microfinance Institution
MIX: Microfinance Information Exchange
NBFI: Non-bank Financial Institution
NGO: Non-Governmental Organisation
OLS: Ordinary Least Squares
OPEXAS: Operating Expense / Assets Ratio
OPSS: Operational Self-Sustainability
PATR: Portfolio-at-Risk
PRFTMA: Profit Margin
RE: Random Effects
RTAS: Return on Assets
RTRE: Return on Equity
SDGs: Sustainable Development Goals
SEs: Standard Errors
SOI: Social Outreach Index
UN: United Nations
VIF: Variance Inflation Factor

CHAPTER I: INTRODUCTION

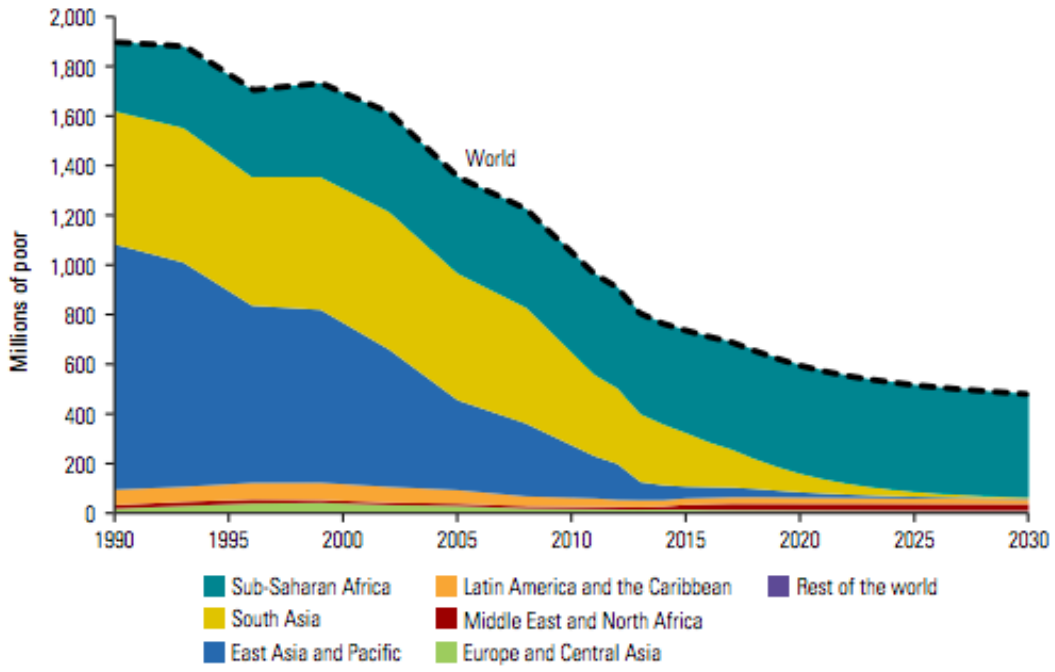
1. Introduction

This chapter explains the background to microfinance and poverty (Section 1.1), the policy context of financial exclusion in the Middle East and North Africa (Section 1.2), and the study's purpose (Section 1.3). Section 1.4 presents the existing literature gap and the significance of the study. Section 1.5 presents the scope, assumptions, and limitations, of the study. Section 1.6 provides an overview of subsequent chapters.

1.1. Background: Microfinance & Poverty

There have been valiant strides made worldwide over the last two decades to reduce extreme poverty (Figure 1). Those living in extreme poverty in the world (under $1.90/day) fell from 36% in 1990 to 10% in 2015 (World Bank, 2019). However, despite this progress, the World Bank still estimates that 40 million to 60 million people will fall into extreme poverty in 2020 (World Bank, 2020).

Figure 1: Number of Poor by Region, 1990–2030



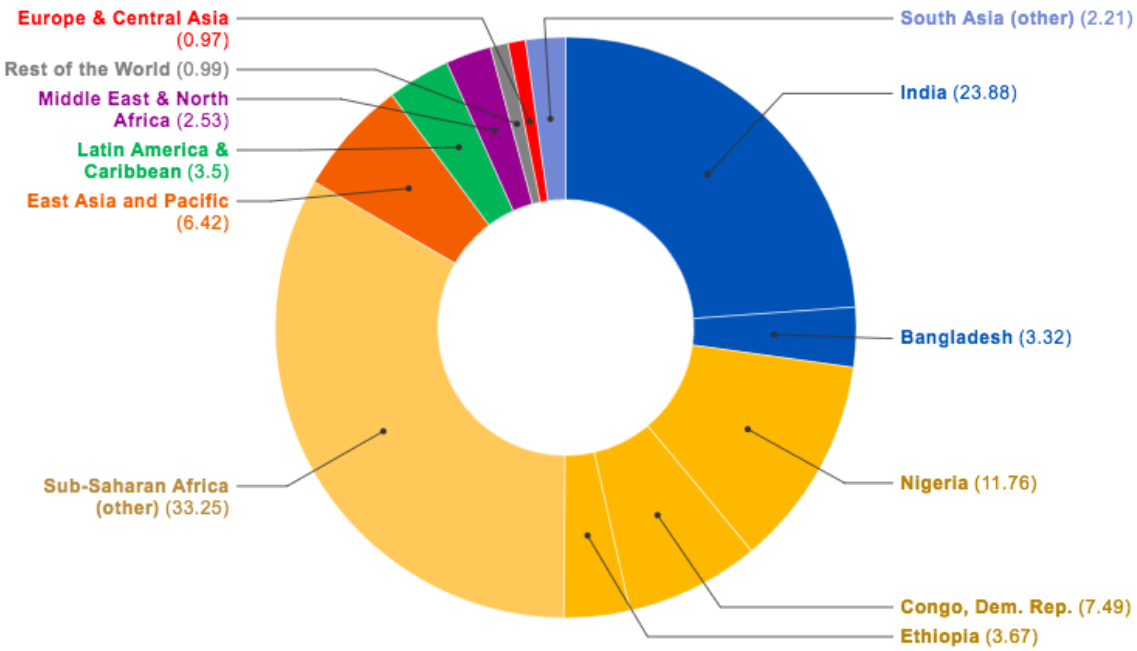
Source: PovcalNet, World Bank, as cited in (Roser & Ortiz-Ospina, 2013)

Furthermore, poverty is a complex and multidimensional concept, making it difficult to measure. Poverty can be characterized by multiple deprivations that the poor face on a daily

basis: low consumption, poor health, lack of access to education, inadequate living standards, a shortened lifespan, living in environmentally hazardous environments, the threat of violence and civil unrest, as well as disempowerment in numerous other domains (Ferreira, 2011).

This study believes a particular focus must be given to women when discussing poverty, as women occupy a vulnerable position in the developing world, and are more likely to live in poverty than men. Women often lack access to education and collateral, and generally work on small scales within the informal sector in order to generate income for the bare essentials, especially for food self-sufficiency (Hermes et al., 2011).

Figure 2: Share of poor people in the world by region or country, 2015



Source: PovcalNet as cited in (Donna Barne & Divyanshi Wadhwa, 2019)

In relation to poverty in the MENA region, the extreme poverty rate is relatively low compared to other regions in the world, with around 3% (Figure 2) of the world's poor inhabiting the region (Donna Barne & Divyanshi Wadhwa, 2019). Despite this, a large proportion of the region's population still live in vulnerable circumstances, leaving them at risk to external shocks. Furthermore, MENA is the only region in the world where the extreme poverty rate increased between 2011 and 2015 (Figures 3 and 4), from 2.7% in 2011 to 5% in 2015, doubling the number of the extremely poor to a staggering 18.6 million (Aziz

Atamanov & Sharad Tandon, 2018). It may not be surprising that conflicts and instability in the region, particularly those conflicts persisting in Syria, Yemen and Iraq, remain one of the main drivers of poverty for MENA.

Figure 3: Extreme poverty rates at $1.90 (2011 PPP) line across regions in 2011 and 2015, (%)

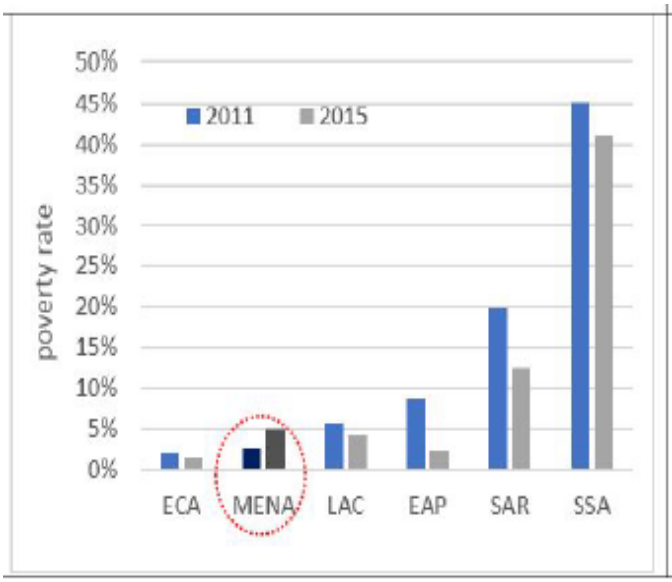
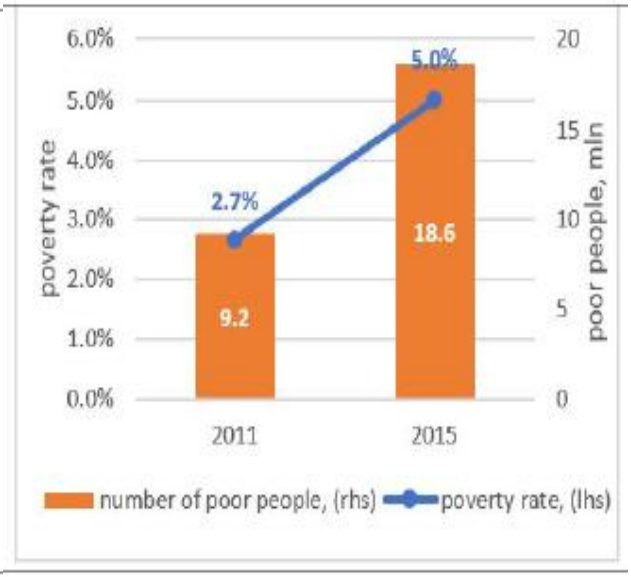


Figure 4: Extreme poverty rates and absolute number of extreme poor at $1.90 (2011 PPP) line in MENA



Source: World Bank as cited in (Aziz Atamanov & Sharad Tandon, 2018)

The contemporary movement of microfinance dates back to the 1970s with the foundation of the Grameen Bank by Professor Mohammad Yunus[1]. The basic premise of Yunus's idea is that access to credit is a basic human-right, through which the poor are able to engage in economic activities to escape poverty (Chamberlain, 2015). Moreover, contrary to a popular belief, the poor can post good repayment rates. Since 1976, the Grameen bank reported $6 billion has been lent, with a repayment rate of 98% (Ina Kota, 2007). The Grameen 'model' has been copied in more than 40 countries and is the most widely cited development success story in the world (Hulme, 2008).

There does not exist an archetypal form of an MFI and these diverse institutions vary considerably in relation to their mission, legal status[2], lending methodologies[3], and the

[1] 2006 Nobel Peace Prize Laureates
[2] NGO, credit unions, commercial banks, cooperatives, nonbank financial institution (NBFI), etc.
[3] Solidarity group lending vs. Individual lending

objectives they pursue[4] (Ben Abdelkader & Mansouri, 2019). In a way, MFIs can be seen as lying somewhere along a continuum, where at one end there is the traditional business (purely financial bottom line) and at the other end – traditional social service (purely social bottom line)(Woller et al., 1999). MFIs have become to be known as the "banks for the poor" and their success can be attributed to the non-traditional methods that they use to hedge against default risk – joint liability, personal guarantees, or social pressure (Bassem, 2012).

Microfinance can also be a useful tool for the implementation of the United Nations (UN) 2030 Agenda for Sustainable Development. While the Sustainable Development Goals (SDGs) do not target financial inclusion specifically, microfinance could prove to be the catalyst for global and inclusive development, providing the most vulnerable in the world with access to services in health, education, food security, energy and housing, to name but a few (Perron, 2016).

1.2. Policy Context: Financial Exclusion and Microfinance in the Middle East & North Africa

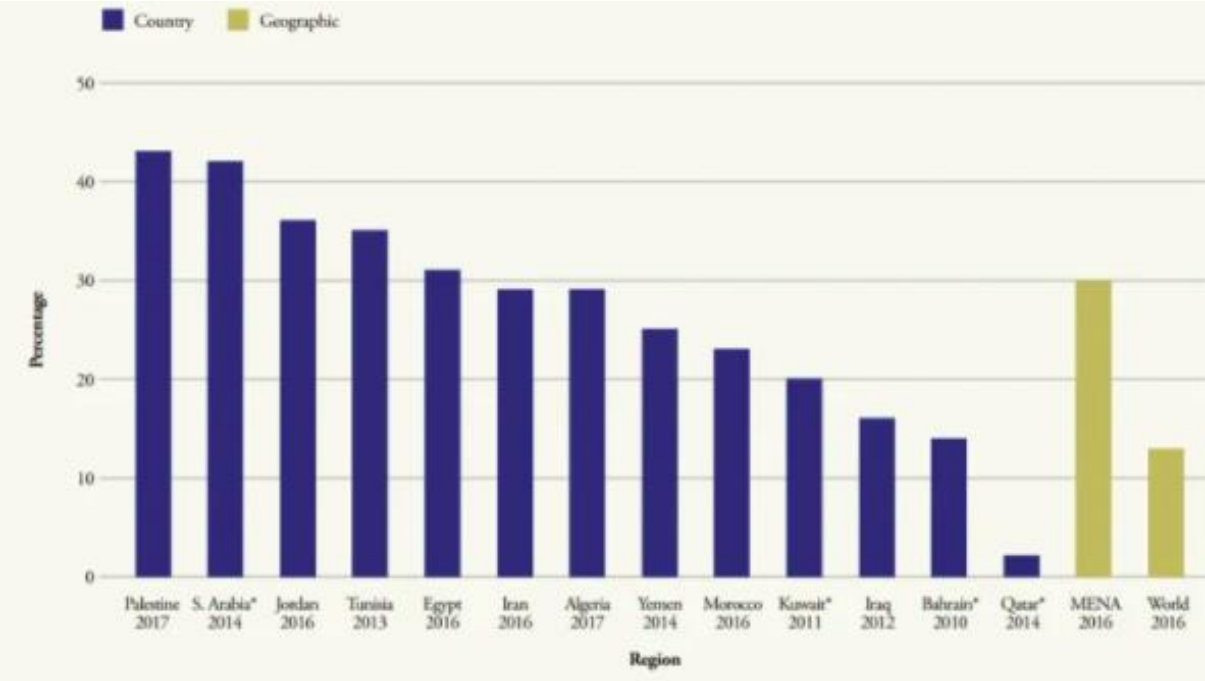
The MENA region lags behind the rest of the world when it comes to financial inclusion. According to 2014 Findex figures, excluding the Gulf countries, the region reports the highest percentage of financially excluded adults, with 80% of the population (200 million people) not having access to a bank account, and 95% not having access to credit (Chehade, 2016). In particular, the women and young people of the region feel the full-burden of financial exclusion, with only 13% of women having a traditional bank account (versus 23% of men), and only 2% of young adults (aged 15-24) having a savings account in 2011 (MicroWorld, 2013), compared to 9.4 percent in Sub-Saharan Africa (McConaghy, 2020).

The microfinance sector in the MENA region is currently the least developed microfinance market worldwide in terms of number of MFIs and loan portfolio (Chamberlain, 2015). According to reports by the World Bank and CGAP, MFIs in MENA are currently reaching approximately 3 million borrowers, with a loan portfolio of over $2 billion — far below the market potential estimated at 56 million borrowers (Bolze, 2017).

[4] Social vs. Financial objectives

The region is characterized by a high population growth rate of nearly 2 percent[5] and by having one of the youngest populations in the world[6]. It also has one of the highest unemployment rates in the world, especially for women and young people. Youth unemployment rates (Figure 5) in the region have been the highest in the world for over 25 years, reaching 30 percent in 2017 (Kabbani, 2019). Three out of four working-age women don't participate in the labour force and constitute 80 to 90 percent of MENA's inactive population (McConaghy, 2020).

Figure 5: Youth Unemployment Rates by Country (MENA)



Source: ILOSTAT Database, as cited in (Kabbani, 2019)

MENA is also a region plagued by conflict, with recent events in both Syria and Yemen, forcing many to flee to neighbouring states. In 2011, the Arab Spring erupted, particularly in Tunisia and Egypt, with demands for social, economic and political reform. It was thought the Arab Spring would create a fertile environment for microfinance which could address the very high unemployment rates in the region, in particular high youth unemployment (Ben Abdelkader & Mansouri, 2019). However, microfinance providers are struggling to operate in an environment so politically and economically unstable.

[5] World Bank Open Data
[6] Median age (MENA region): 26.8 years old

There are numerous reasons for the limited outreach of microfinance in the MENA region, including lack of enabling regulations, weak supervision and poor risk management, that has been exacerbated by political conflict and social upheavals (Chamberlain, 2015). The microfinance sector of the region is dominated by NGOs and government-run programs, which limits their ability to grow and to diversify product range[7] (Chehade, 2016). Additionally, MFIs lack the ability to accept deposits in many of the region's markets[8], which provide an alternative to commercial funding (MIX et al., 2010). Finally, many of the countries in the region lack the necessary financial infrastructure and there are low levels of financial literacy among potential beneficiaries (Akhtar & Pearce, 2010).

1.3. Purpose of Study

This study explains the relationship between the financial sustainability of microfinance institutions and their depth of outreach to the poor in the Middle East and North Africa. Applying dynamic, fixed and random effects estimations, it aims to quantify whether MFIs in the MENA region experience mission drift, when MFIs migrate from their social objective of providing financial services to the poor, towards their financial objective of financial viability. In particular, this study analyses whether the depth of outreach (measured by average loan size per borrower and the percentage of female borrowers) is explained by a specific set of determinants associated with financial sustainability (a focus on operational self-sustainability).

The study will analyse MFI mission drift in the MENA region at MFI and regional levels. In particular, it includes measures of financial performance, client structure, productivity and efficiency, risk and liquidity, revenue, and financing structure. Finally, it intends to identify a specific set of determinants that are most associated with mission drift of MFIs away from their social objective of outreach to the poor. More precisely, it aims to answer the following research questions:-

Main Research Question: What is the relationship between the financial sustainability of microfinance institutions and their depth of outreach to the poor in the Middle East and North Africa?

[7] Limited savings products, insurance, etc.
[8] Syria and Yemen have introduced new laws permitting the establishment of deposit- taking MFIs

Sub-research Questions:

i. What are the implications of financially sustained, scaling up of microfinance services that leads to concerns surrounding mission drift?
ii. What is the average level of outreach determinants at the MFI and regional levels?
iii. What are the specific determinants of financial sustainability that most explain changes in the depth of outreach?
iv. What are the consequences of the process of commercialisation on the depth of outreach in the MENA region?

1.4. Significance of the Study

Adair & Berguiga (2014) conducted a similar study for the MENA region using panel data from 1998-2011. However, this study does not incorporate recent data relating to the microfinance sector in the region. It only uses one measure of depth of outreach as a dependent variable (Social Outreach Index[9]), which limits analysis of other groups associated with depth of outreach. Finally, It uses a limited range of variables relating to risk and liquidity, revenue and expense, financing structure.

The present study extends the previous study by adopting more recent data from 2008-2017. It also includes the percentage of female borrowers as a proxy for depth of outreach and a dependent variable in its own right in the second dynamic model. Finally, it incorporates an extensive set of determinants of financial sustainability, in particular, additional variables that reflect financial performance (return on equity) revenue and expenses (profit margin and operating expenses), risk and liquidity (loan loss rate), and financing structure (debt-to-equity ratio).

The findings of this are expected to be informative for the national financial inclusion strategies of MENA countries, as well as for the Arab Monetary Fund, which since 2012 has been mandated to support such efforts through a dedicated task force. It seeks to provide specific policy recommendations towards ensuring that MFIs in MENA provide equitable outreach of their services to the financially excluded (in particular the poor and women).

[9] Gap between the poverty line ($2 per day per capita) and the average loan per borrower, both according to GNI per capita

1.5. Scope, Assumptions, and Limitations of the Study

This study uses panel data to create two dynamic, quantitative models that investigate the relationship between the depth of outreach and financial sustainability of 52 microfinance institutions in 10 countries[10] of the MENA region from 2008 to 2017. It does not take into account the effects of the lending methodology (due to data availability), maturity or charter status (vast majority are NGOs) of MFIs. Furthermore, it is an analysis at MFI and regional levels.

Data from MIX is self-reported by MFIs, therefore there could be issues surrounding accuracy. Furthermore, only MFIs that have been subjected to audit and received a rating of 3 diamonds or above, were included in this study, which reduced the sample size. It uses an unbalanced panel dataset in order to incorporate as much data as possible into the models and avoid bias in data construction. Difficulties were encountered throughout this research in relation to the quality and availability of data for the region. This study was also limited by the outbreak of the COVID-19 pandemic[11]. Moreover, as the research progressed, the topic was further refined.

Additionally, in relation to outreach variables, this study aims to study the effect of financial sustainability only on measures of depth of outreach and not breadth of outreach. However, a measure for breadth and size (number of active borrowers), was included in the original models, pre-estimation. Moreover, it does not include all possible sets of determinants for both the depth of outreach and the financial sustainability of MFIs due to unavailability and incompleteness of data, as detailed in Chapter III.

1.6. Outline of Chapters

Subsequent chapters are outlined as follows. Chapter II reviews existing theoretical and empirical literature in order to develop the methodological approaches for this study. Chapter III elaborates on the methodology that has been adopted for this study. Chapter IV presents and discusses the main results and findings from this research. Chapter V provides concluding remarks and recommendations.

[10] Egypt, Iraq, Jordan, Lebanon, Morocco, Sudan, Syria, Tunisia, West Bank and Gaza, and Yemen
[11] Limited access to valuable client information and resources from LASAARE

CHAPTER II: LITERATURE REVIEW

2. Literature Review

This chapter presents a theoretical (Section 2.1) and empirical (Section 2.2) review of the relevant literature related to this study.

Section 2.1 offers a theoretical overview of the concepts, causes, and determinants of mission drift within the microfinance sector. It also highlights the conceptual framework, created by the author, which guides the analytical proceedings of this study. Succeeding sub-sections present a theoretical account of the relationship between financial sustainability of microfinance institutions and their outreach to the poor, in particular some of the determinants used for analysing an MFI's dual objectives (social and financial).

Section 2.2 presents a review of empirical studies, including both panel and cross-sectional studies, relating to mission drift, and offers a comparative overview of methodologies adopted in recent empirical literature. Studies include those conducted at regional and cross-country levels. Section 2.3 discusses the rationale behind the methodology used in this study. Section 2.4 concludes the chapter with a brief explanation of the existing literature gap.

2.1. Review of the Theoretical Literature

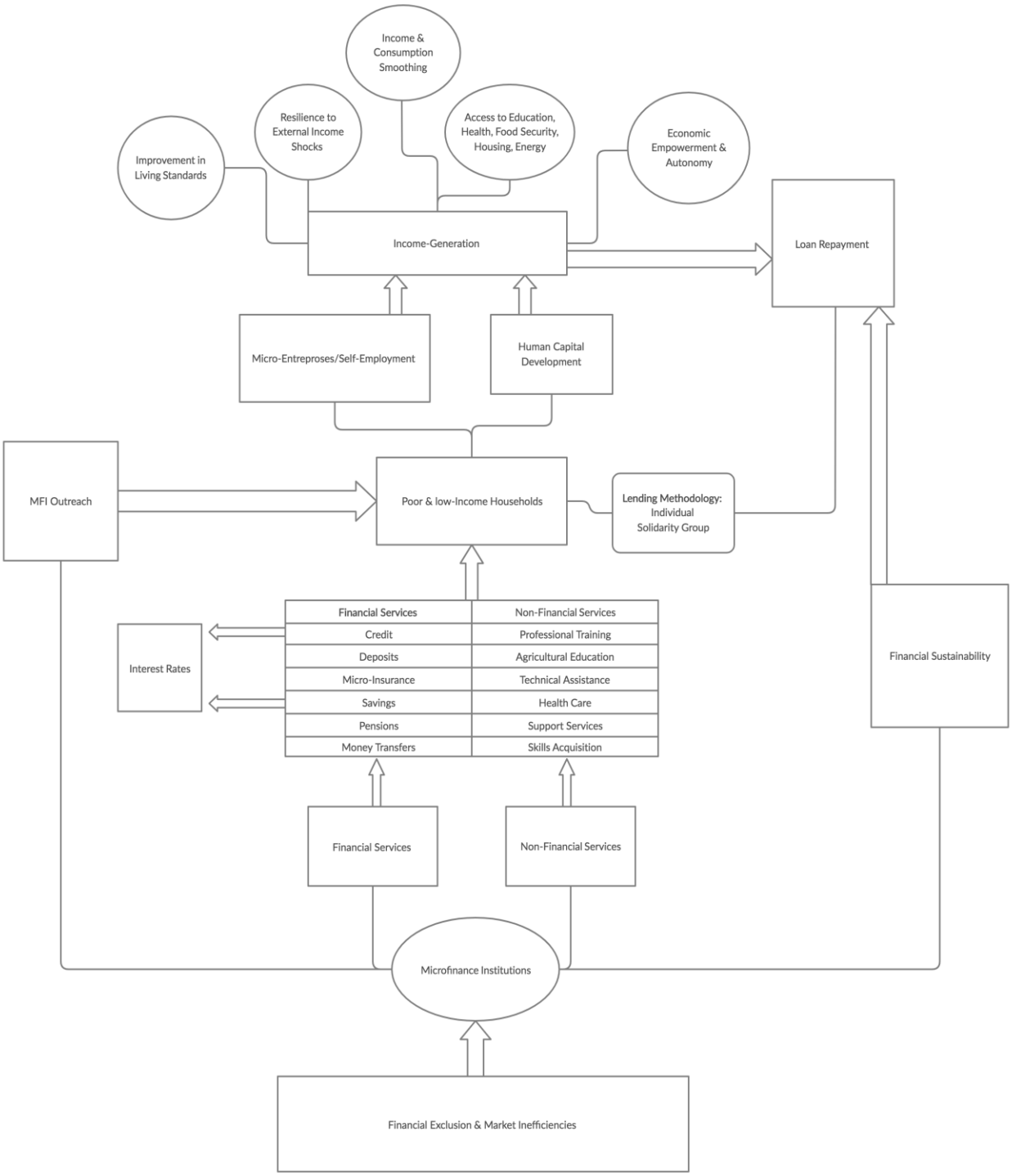
2.1.1. Conceptual Framework of Microfinance

It is through microfinance, that we attempt to improve not only the efficiency of financial markets, but also their fairness (Cull et al., 2011). Microfinance aims to correct market failures caused by financial exclusion through expansion of outreach to the poor, empowering people through providing them with access to capital and giving them autonomy over their own economic decisions (Cull et al., 2009). This section presents a conceptual framework for microfinance (Figure 1), designed by the author and provided on page 19.

Originally, the microfinance sector consisted mainly of microcredit. However, due to its success as a development tool, it now includes the provision of a range of financial services, including credit, deposits, savings, micro-insurance, pensions, money transfers and other services to poor and low-income households, that have been excluded from the traditional banking sector due to their socio-economic profile (Marakkath, 2014).

Microfinance clients are generally considered by the mainstream financial sector as higher risk. These clients usually lack any collateral or assets, do not possess official documentation, and are often illiterate (Food and Agriculture Organization of the United Nations (FAO), 2019). Typical profiles of microfinance clients are: rural and urban micro-entrepreneurs engageing in productive, self-employed activities for income generation, usually to smooth consumption or mitigate against income shocks (J. K. Adjei et al., 2009). MFIs also provide a range of non-financial services to their beneficiaries with the aim of improving their overall well-being, including professional training, agricultural education, technical assistance, healthcare and many other services (Flores & Serres, 2009).

Figure 6: Conceptual Framework of Microfinance



Source: created by author

2.1.2. The Double Bottom Line: A Win-Win Proposition?

Microfinance institutions are unique as their performance is based on two broad objectives - financial sustainability and outreach. These objectives are known as an MFI's double bottom line (Tulchin, 2003). There is much debate whether there is inherently a trade-off between these objectives or whether they can be complementary. In other words is it possible for MFIs to (Wijesiri et al., 2017).:

i. Achieve unsubsidised, financial self-sufficiency by covering all operating costs?
ii. Extend financial services to a large number of people (breadth of outreach)?
iii. Give preference towards the lower income strata of the poor (depth of outreach)?

However, too great a focus on financial sustainability may cause MFIs to shift their focus away from providing financial services to the very poorest; through the enforcement of strict client selection, by which they would target clients that are "better-off" (nearer the poverty line) or those with entrepreneurial skills (J. K. A. Adjei, 2009). On the other hand, too great of a focus on the social objective of an MFI could lead to the institutions setting interest rates far below market rates, which would threaten the financial viability of the institution (Philippe Adair & Berguiga, 2015).

2.1.3. The Meaning and Concept of Outreach in Microfinance

Microfinance aims to improve the standard of living of the impoverished and spur economic activity by generating employment (Morgan, 2015). The availability of donations and subsidies is finite. The current microfinance loan portfolio is estimated at $25 billion worldwide. However, this represents only approximately 10 percent of the market demand (Epstein & Yuthas, 2010). Therefore, there currently exists a huge gap between potential demand for and supply of microfinance loans.

Outreach is an ability of MFIs to provide financial services to the poorest segments of the population and is classified by two dimensions: the depth and the breadth. It is a challenge to find accurate indicators for the depth dimension of outreach. Average loan size is widely used in the applied research as a proxy for depth of outreach (R. Mersland & Øystein Strøm, 2013; Roy Mersland & Strøm, 2010; Nawaz, 2010; Wagenaar, 2012). The assumption is that the smaller the average loan size, the deeper the outreach of an MFI to low income clients, as poorer clients generally take smaller loans (Gutiérrez-Goiria & Goitisolo, 2011). Likewise, an increase in the average loan is a common sign of "mission drift" (Saab, 2015). The use of

solely average loan size has received criticism in the existing literature due to the weakness associated with using an average value (Vanroose & D'Espallier, 2013a; Wagenaar, 2012), as well as other limitations.

Some studies use the adjusted variable (average loan size over GNI per capita) as a different proxy for outreach (Cull et al., 2011b; Kar, 2013; Mia & Lee, 2017; Quayes, 2012). Even though this proxy is not perfect, it has been widely used in the studies as a tool for capturing the true economic situation of borrowers and allows for cross-country analysis. Adair & Berguiga (2014) go one step further in measuring depth of outreach by creating a Social Outreach Index (Adair & Berguiga, 2010a; Arrassen, 2017; Bassem, 2012; Berguiga et al., 2017).

An alternative for depth of outreach is the percentage of female borrowers (Zerai & Rani, 2011), which is also used as a dependent variable in this study. Because fact women make up the majority of the world's poor, an increased focus on women will be accompanied by an overall increase in the depth of outreach (Ben Abdelkader & Mansouri, 2019). Furthermore, the literature indicates that MFIs which serve more women provide smaller loans. Other measures of depth of outreach have included the extent of lending to rural communities (where poverty is most concentrated) and lending through group loans (Roy Mersland & Strøm, 2010). However, these measures are not the focus of this study.

2.1.4. Female Empowerment & Microfinance

Microfinance is an effective tool for the empowerment of women. They can use this in order to create or grow their own businesses and strengthen their integration into the labour market (Lopatta et al., 2017). MFIs targeting women have often been credited with increased efficiency within the sector; a body of research shows that targeting women is associated with higher repayment rates (Bibi et al., 2018).

For women, microfinance is an empowering tool that gives them autonomy over their economic choices. Women face negative externalities from microfinance in the developing world; increased social tension, excessive debt burdens at family level and increased violence and intimidation against female borrowers (Rossel-Cambier, 2010). Women generally are the primary savers in households and therefore are in need of savings products that allow them to save for lifecycle needs; school fees, health emergencies, care for elderly family members, etc. (Frank et al., 2008).

2.1.5. MFI Path to Financial Sustainability

Simply defined, financial sustainability indicates that for survival and to add to their asset base, it is vital that revenue from the outstanding loan portfolio should be in excess of the cost of providing these services (Borbora & Kumar Sarma, 2011). Often the path to financial sustainability is misinterpreted as striving for profit maximization, without considering the budget constraint faced by MFIs (Roy & Pati, 2019).

Financial sustainability can be achieved through ensuring high repayment rates, sufficient interest revenue from loans, and that operating costs are contained as much as possible to guarantee the efficient use of resources (Kumar Kar, 2011). Risk management planning is essential within the sector, in order for MFIs to anticipate issues related to recovering outstanding loans, thereby preventing the risks associated with perverse contagion[12] among borrowers (Ayayi & Sene, 2010a). MFIs that have managed to become financially sustainable tend to operate more efficiently. To take advantage of economies of scale, they may attempt to expand their loan portfolio by targeting clients nearer the poverty line (just above or below)(Mecha, 2017).

Although not a means to an end, financial sustainability can ensure that MFIs have increased access to financial resources from commercial funding, which ensures the expansion of their outreach to the poorest in society (Zerai & Rani, 2011). An estimated 2 billion adults remain unbanked globally (Demirguc-Kunt et al., 2015), and due to this unmet demand proponents of the financial sustainability paradigm believe in the rapid, sustainability-driven, scaling up of microfinance services (Kar, 2010).

A core foundation of financial sustainability is that donor funding is neither inexhaustible nor free (Greeley, 2003). MFIs should aim to eventually become independent of subsidies and donations, being able to use funds at the market price. Of course, the vast majority of MFIs that are now financially self-sufficient have relied on donations and government support when first beginning operations. However, subsidies should be used to assist MFIs in

[12] Numerous client defaults within an MFI's gross loan portfolio

becoming operational with the goal of self-sufficiency, not dependency[13]. In order to measure financial sustainability, MFIs will be required to maintain efficient financial accounts and follow recognized accounting practices that provide full transparency for income, expenses, loan recovery, and potential losses (Kereta, 2007).

2.1.6. The Commercialisation & Regulation of the Microfinance

Microfinancing started as a subsidy-dependent tool for poverty alleviation. As the microfinance sector has matured and donor funding has reduced, the pursuit of commercialisation has been presented as a means of achieving the double bottom lines of MFIs (Al-Azzam, 2019). Commercialisation is a broad term that refers to application of market-based principles to the microfinance sector. It is associated with the progression of an MFI away from donor or subsidised funding, towards commercial sources of funding from private investors, such as debt and equity (Frank et al., 2008).

Through commercialisation, MFIs would be able to offer clients a more diversified range of non-credit products, like savings, and would benefit from improved management and governance structures. This would require greater transparency from MFIs through regulation by the relevant banking authorities, but would provide greater organisational stability (Wijesiri et al., 2015). Commercial banks, however, may be reluctant to lend funds to the microfinance sector due to the perception of MFIs as being high risk.

The main focus of for-profit MFIs is to maintain and enhance profits, reduce dependence on donations and subsidies, contain costs and maintain a low exposure to risk (Chakravarty & Pylypiv, 2015). MFIs with a higher proportion of private funds tend to have a lower overall number of portfolios at risk (Al-Azzam, 2019). Non-profit MFIs usually maintain significantly higher percentages of women borrowers (measure of depth of outreach) than for-profit. Regulation would permit MFIs to take advantage of client deposit mobilization, providing an alternative source to commercial funding (Frank et al., 2008). However, complying with regulations may be associated with higher costs for an MFI, for example, the high cost of skilled labour needed for the process (Cull et al., 2011). In response to these higher costs, there is the risk that MFIs increase their interest rates or loan sizes in order to

[13] On external subsidies and donations

maintain the same level of profitability, both of which could lead to the exclusion of poorer borrowers.

Recently a large number of MFIs (especially in Latin America) voluntarily agreed to be financially regulated, operating as profit-oriented financial institutions permitted to accept deposits (Quayes, 2012). For example, Mexico's Compartamos ("Let's Share") used a $6 million investment to transform itself into a billion-dollar company in less than a decade, expanding rapidly while charging very high interest rates to borrowers (Nawaz, 2010). Through scaling-up, MFIs can expand their services, leading to lower operating costs and an increase in their breadth of outreach (i.e. number of clients served)(Kar, 2010).

At the same time, a growing number of commercial banks and investors, seeing the success and potential profitability of MFIs, have become interested in financing and supporting the microfinance sector. Many commercial banks, for example HSBC and Deutsche Bank, downscaled their operations to microcredit programs, directly granting loans to the micro-entrepreneurs or acquiring shares in the MFIs (Bassem, 2012). This has resulted in emerging competition within the microfinance sector, with MFIs shifting their strategies more towards lowering costs and increasing operational efficiency (Aveh et al., 2013). This increased competition could result in mission drift, as poorer clients become less profitable, as well as other negative externalities (e.g. over-indebted clients, an increased cost per dollar of loans, and a decline in repayment rates)(Hossain et al., 2020).

2.1.7. Welfarist vs. Institutionalist Approaches

The competing perceptions of financial self-sufficiency and serving the poor have led to two different approaches, Welfarist and Institutionalist, which Jonathan Morduch refers to as the "microfinance schism" (Morduch, 2000). Within the microfinance sector there does not exist an established “ideal model” for MFI governance mechanisms.

The Welfarist approach (also known as the direct credit approach) prevailed in the 1980s and perceives microfinance as an effective tool for poverty alleviation and improving the lives of the poor (Bassem, 2012). They place greater weight on depth of outreach (in our case average loan size and percentage of female borrowers), as opposed to breadth of outreach (number of active borrowers)(Woller et al., 1999). Their objective is essentially to create self-employment opportunities for the poor that are economically active, especially women.

The most prominent examples of the Welfarist approach are the Grameen Banks in Bangladesh and the FINCA-style village banking programs in Latin America, Africa and Asia (Woller et al., 1999), whose focus is on outreach to the poor. When evaluating the effectiveness of microcredit programmes, Welfarists use household studies to estimate the living conditions of targeted populations. Measurement is through changes in the level of income, nutrition and education of the poor as well as their access to health care services and insurance (Bassem, 2012).

For Institutionalists (also known as the financial market approach), the primary objective of microfinance is financial deepening within the logic of the market. They believe in the creation of a separate system of "sustainable" financial intermediation for the majority of the population (Woller et al., 1999). Institutionalists promote competition and financial sustainability within the microfinance sector as the most efficient ways of maximising the breadth of outreach (Kar, 2010). They are usually firmly against MFIs depending on subsidies as a source of funding. They emphasize the basic economic principle of scarcity in the microfinance sector, in that MFIs have a limited amount of resources and an unlimited amount of demand from the world's financially excluded.

Institutionalists believe that the transformation from non-profit organizations into private, regulated MFIs is a "natural progression" for the microfinance sector (Tchakoute-Tchuigoua, 2010). This approach is supported by prominent international organisations, such as the World Bank, the United Nations, and the Consultative Group to Assist the Poorest (CGAP)(Bassem, 2012). When measuring the effectiveness of microfinance programmes, institutionalists use proxies and carry out "institutional studies". They are interested in market variables such as the number of poor people affected, financial self-sufficiency, profitability, quality of service, etc (Bassem, 2012).

2.2. Review of the Empirical Literature

This section relates to the empirical literature on mission drift, reviewing studies that analyse the relationship between the financial sustainability of MFIs and their depth outreach to the poor. Studies are arranged into the following two groups: cross-country and the MENA region as a whole. Table 1 provides a non-exhaustive list of recent studies that have analysed mission drift.

2.2.1. Review of Cross-Country Studies on Mission Drift

Cross-country studies show that mission drift, in the form of decreased outreach, occurs when MFIs increase their average loan size and serve a lower percentage of female borrowers (Cull et al., 2009, 2011; Lopatta et al., 2017; Wagenaar, 2012). MFIs that decide to go through the process of commercialization, attempt to enhance ratings and achieve scale (Epstein & Yuthas, 2010). Arrassen (2017) studied 120 Sub-Saharan African MFIs and found commercialisation weakens outreach without significantly improving self-sustainability and profitability.

Mission drift tends to occur in MFIs where poverty alleviation has never been the main focus (individual lenders, banks and mutual/cooperative)(Arrassen, 2017). Quayes (2012) found that not-for-profit MFIs have better outreach (more socially efficient)(Tchakoute-Tchuigoua, 2010), through lending smaller loan amounts to more borrowers, in particular women (Sheremenko et al., 2017). Smaller loans lead to lower earnings, reduced profitability, and higher costs per dollar lent in comparison to for-profit MFIs (Cull et al., 2009, 2011; Kar, 2013; R. Mersland & Øystein Strøm, 2013). However, dynamism in MFIs' cost reductions countervails the tendency for higher average loans (Roy Mersland & Strøm, 2010).

Hermes et al., (2011) found that MFIs with more women borrowers and lower average loan sizes are less efficient, but through striving for cost-efficiency MFIs can avail of spillover effects, which could contribute to higher poverty reduction for poorer clients (preferably women) at the macro level (Armendáriz & Szafarz, 2011). Bibi et al., 2018 found that South Asian MFIs are more financially efficient on average than socially efficient.

Wijesiri et al., (2017) found that MFI size matters, as larger MFIs tend to have higher financial and social efficiency, which is attributed to the presence of higher-scale economies, as larger loan portfolios significantly reduce delivery costs (Kar, 2013). Furthermore, increasing the borrowers per loan officer ratio could be a promising way of reducing costs, especially in group-based delivery models (Kumar Kar, 2011). Mia & Ben Soltane (2016) in their study of 50 South Asian MFIs, found that these institutions suffer from inexperience in cost cutting delivery methods and that a higher return on assests can enhance MFIs' productivity.

Sheremenko et al., 2017, in their study of Eastern European and Central Asian MFIs,

found large MFIs are characterised by reduced outreach. High growth rates in the number of active borrowers can also negatively affect social performance (Dorfleitner et al., 2017) leading to an increase in loan write-offs and an increase in the total risk of portfolios (Chakravarty & Pylypiv, 2015). Vanroose & D'Espallier (2013) results confirm a negative relation between a country's financial sector development and MFI outreach and financial performance. MFIs reach more clients and are more profitable in countries where access to the traditional financial system is low (Vanroose & D'Espallier, 2013). This competition may push MFIs down the market to poorer clients and making mission drift less likely.

A high quality credit portfolio is instrumental in the financial sustainability of MFIs (Ayayi & Sene, 2010). A high write-off ratio (Dorfleitner et al., 2017) and increased level of portfolio risk reduces efficiency (Bos & Millone, 2015) and can cause MFIs to switch to better-off clients for better repayment rates (Dorfleitner et al., 2017; Kar, 2013). Ghosh & Van Tassel (2008) found the most effective microfinance institutions optimally shift their lending portfolio away from the poorest clients to better-off clients. MFIs can use this larger budget to achieve a larger reduction in poverty, as well as reaping the benefits of economies of scale, lower risk, and profit-oriented investments (Bos & Millone, 2015). However, Nawaz (2010) believes that lending to well-off clients with larger loan sizes cannot guarantee profitability, because it ultimately leads to an increase in administrative costs, as larger loans require more individual attention and supervision (Kar, 2013).

MFIs with a higher fraction of subsidies (Dorfleitner et al., 2017) are less prone to social failure, reaching poorer borrowers with lower interest rates, however this has an adverse effect on financial sustainability, in particular, return on assets (RTAS) declines (Al-Azzam, 2019). Chakravarty & Pylypiv (2015) found that MFIs with a higher proportion of private donor funds to public subsidies have lower rates of portfolios at risk, fewer delinquent loans, and that their overall portfolios are less risky. Nawaz (2010) also found that raising the interest rates charged on loans leads to improved financial performance, by lowering subsidy dependence and improving sustainability. Hossain et al., 2020 found that competition has an adverse effect on MFIs' economic sustainability undermining their breadth of outreach, but enhancing their depth of outreach.

2.2.2. Review of MENA Studies on Mission Drift

In the MENA region, Berguiga et al., 2017 stated that MFIs, whether Islamic or conventional, face a financial vs. social performance trade-off. However, Ben Abdelkader & Mansouri (2019) show that Arab MFIs have the ability to combine social and financial performance and remain solid in times of crisis. Adair & Berguiga (2014) found financial performance is strongly determined by portfolio quality whereas the exclusive targeting of women is the primary determinant of social performance. In the short run, MFIs seek to decrease their depth of outreach in order to secure payback.

Bassem (2012) found when MFIs strive for better financial performance, by reducing their portfolio-at-risk, they tend to deviate from the most disadvantaged populations and that MFI size has a negative impact on their ability to serve female borrowers. Saab (2015) found that interest rate spread highly affects the microfinance sector in the MENA region and could lead to a mission drift if the change is unfavourable, i.e. if the interest rate is too high for poorer clients to pay back.

Adair & Berguiga (2015) show that most MFIs in the MENA region are profitable while applying a high interest rate that borrowers would be able to bear. The rise in inflation has a negative effect upon the level of lending rates; hence, MFIs must often increase their rates to avoid deterioration of the loan portfolio.

2.3. Existing Literature Gap

Despite success stories and some cases of severe crisis, little research has been devoted so far to the microfinance industry in the MENA region, and it has been largely ignored by past research, despite the lack of performance analysis (Adair & Berguiga, 2014; Bassem, 2012; Ben Abdelkader & Mansouri, 2019). Therefore, this study seeks to provide richer insights and results into the subject of mission drift in the MENA region. It uses panel data, as opposed to cross-sectional data (Cull et al., 2011b; Quayes, 2012; Sheremenko et al., 2017), as more data is available for consecutive years, and the determinants of financial sustainability and their variation on the depth of outreach can be measured over time, which is vital for a phenomenon like mission drift.

This study incorporates panel data, through two dynamic estimation techniques. It uses more recent data where possible, covering the period 2008-2017, as opposed to older studies (

Adair & Berguiga, 2014; Berguiga et al., 2017; Saab, 2015), the most recent of which analyses mission drift in the MENA region only up until 2015.

Few existing studies incorporate both average loan size and percentage of female borrowers as dependent variables. This will provide this study with a more in-depth analysis in relation to depth of outreach (Cull et al., 2011; Nawaz, 2010; Rossel-Cambier, 2010). This study incorporates an extensive set of determinants for financial sustainability including measures for financial performance, client structure, revenue and expenses, productivity and efficiency, risk and liquidity, and financing structure. In particular, and in contrast to the majority of existing literature, it includes, loan loss rate (Kar, 2010; Quayes, 2012), profit margin (R. Mersland & Øystein Strøm, 2013; Roy & Pati, 2019; Singh & Padhi, 2019), operating expense/assets ratio (Hossain et al., 2020; Kar, 2010) and debt-to-equity ratio (Quayes, 2012; Roy & Pati, 2019; Sheremenko et al., 2017).

This study analyses mission drift at the MFI-level using MIX Market data. MIX Market data is self-reported by MFIs and it is possible that this may lead to bias towards larger and more commercially oriented MFIs (Vanroose & D'Espallier, 2013).

Table 1: Summary of the Major Cross-Country & Regional Empirical Literature on Mission Drift

Authors	**Cross Section or Time Series**	**Cross-Country/Region**	**Time-Frame**	**Dependent Variable (s) for Depth of Outreach**	**Methodology**
Bassem (2012)	Time Series	MENA	2008-2010	SOI[14]; FMPWR	Generalized Least Squares (GLS)
Adair & Berguiga (2014)	Time Series	MENA	1998-2011	SOI	Three Stage Least Squares with Fixed Effects (FE3SLS); Error Component Three Stage Least Squares (EC3SLS)
Mersland &	Time Series	Cross-	1998-2008	LNBB	Fixed Effects

[14] Developed by Berguiga & Adair (2014)

Øystein Strøm (2010)		Country (74 countries)			Method; Generalized Least Squares (GLS); Generalized Method of Moments (GMM)
Hossain, Galbreath, Hasan, Randøy (2020)	Time Series	Cross-Country (59 countries)	2005-2014	log(LNBB)	Random Effects GLS Model
Berguiga, Said, Philippe Adair (2017)	Time Series	MENA	2004-2015	SOI	Feasible Generalized Least Squares
Quayes (2012)	Cross-Sectional	Cross-Country (83 countries)	2006	LNBB/GNI per capita	Three-Stage Least Squares
Rossel-Cambier (2010)	Cross-Sectional	Latin America and the Caribbean	2006	LNBB/GNI per capita; FMPWR	Ordinary Least Squares
Nawaz (2010)	Time Series	179 MFIs worldwide	2005-2006	LNBB; FMPWR	Random Effects Model
Cull, Demirguc-Kunt, Morduch (2011)	Cross-Sectional	67 developing countries	2003-2004	LNBB/GNI per capita	OLS; Logit Model; Three-Stage Least Squares Method
Vanroose & D'Espallier (2013)	Time Series	Cross-Country	1997-2006	LNBB/GDP per capita	Random Effects Estimation
Arrassen (2017)	Time Series	Sub-Saharan Africa	2000–2009	LNBB/GNI per capita; FMPWR; SOI	Random Effects Method
Mersland & Strøm (2013)	Time Series	73 countries	1998-2008	LNBB	General Method of Moments (GMM)

Sheremenko, Escalante, Florkowski (2017)	Cross-Sectional	Eastern Europe and Central Asia	2007-2008	log(LNBB)	OLS; 2-Stage Least Squares (2SLS); Recursive Model Estimation
Wagenaar (2012)	Time Series	102 countries	1996-2010	LNBB; FMPWR	Fixed Effects Model

2.4. Review of the Methodologies Adopted in the Literature

Section 2.3.1 provides a review of studies relating to the identification of determinants of mission drift. Section 2.3.2 reviews the different methodologies adopted by the empirical studies.

2.4.1. Studies on the Identification of Determinants of Mission Drift

Table 1 presents a non-exhaustive list of a similar studies that have identified the determinants of financial sustainability regionally (including MENA) and across countries. Below, this section of the study discusses some of the observations from the literature relating to determinants of financial sustainability.

As discussed previously, the majority of the studies incorporate average loan per borrower into the dependent variable as a measure of the depth of outreach. Some studies go further and include the percentage of female borrowers as another proxy for depth of outreach. Furthermore, the determinants of financial sustainability and their association with depth of outreach are very much contextual, varying across MFIs, countries, and regions (as clearly seen from Table 1). The vast majority of studies in the existing literature use either fixed or random effects estimations. We ultimately use fixed and random effects for the final models, as opposed to pooled OLS, because we are observing the same sample of MFIs through time (2008-2017). For the pooled OLS estimations, standard errors (SEs) are clustered due to the panel data structure of the dataset. With the pooled OLS regression all individual specific effects are ignored.

2.4.2. Studies Based on Fixed & Random Effects Estimations

The fixed and random effects estimations are two competing approaches, that both control for unaccounted effects, however they require different assumptions (Dieleman & Templin, 2014). Random effects estimations are commonly used in research relating to health, while

other disciplines prefer the fixed effects estimation. Most of the studies reviewed from the empirical studies use fixed or random effects models in order to analyse the relationship between the financial sustainability of MFIs and their depth of outreach to the poor over time. These studies take place regionally and across countries. Table 1 presents a list of the types of quantitative methods used by leading studies in the field of mission drift in the microfinance sector. Subsequently, this section will present some observations in relation to fixed and random effects models presented in Table 1.

Fixed effects estimations control all time-invariant or idiosyncratic differences between MFIs (Torres-Reyna, 2007). The estimation is used to remove individual MFI heterogeneity, due to the fact the fixed effects are assumed constant over the observed time frame (2008-2017)(Allison, 2009). As a result, the estimated coefficients of fixed effects models cannot be biased because of omitted time-invariant characteristics (legal status, etc.)(Torres-Reyna, 2007). In practice, the fixed effects estimation will subtract averages of individual MFIs from annual observations, and then we will perform a regression on these transformed variables (Mersland & Strøm, 2010). The unobserved effects are contained within the fixed effect, or time invariant, error terms (Mersland & Strøm, 2010).

Random effects estimations assume that there are between-MFI differences in the dependent variables and that this should be reflected in the model of this study. In line with multivariate modelling, the random effects estimation allows us to incorporate both time-varying and time invariant predictors of variation in the dependent variables (Allison, 2009). The random effects estimation is performed by assuming that the fixed effect error is part of the error term (Roy Mersland & Strøm, 2010), and can be used to isolate the effect of fixed-time factors such as MFI legal status and geographic location (as suggested by the Hausman test results)(Vanroose & D'Espallier, 2013b).

The random effects model has a number of advantages, making it popular in performance studies. First, the RE estimation reduces the potential for omitted variable bias, by taking into account all the unobserved MFI-specific residual variations in MFI performance under the term $\mu(it)$ (Stock & Watson, 2007). Second, RE estimations are better suited than fixed effects estimations, to tackle the time-invariant nature of some of the covariates (Vanroose & D'Espallier, 2013). Finally, random effects estimations allow us to make inferences beyond

the sample used in the panel data model. This study uses a Generalized least squares (GLS) estimation for the random effects estimation.

The Hausman test is applied to each model separately to determine whether fixed effect models or random effect models are superior (Nawaz, 2010). A modified Wald statistic for groupwise heteroskedasticity is applied in the case that a fixed effects estimation is found to be more appropriate by the Hausman test. The Breusch–Pagan test is applied for the random effect estimation in order to decide between a random effects regression or a simple OLS regression.

CHAPTER III: METHODOLOGY

3. Methodology

Section 3.1 discusses the analytical framework adopted in the present study. Section 3.2 provides a description of the data, followed by the procedure that was adopted in the selection of variables. Section 3.3 presents the econometric framework used for the analytical strategy applied in this study.

3.1. Analytical Framework for Mission Drift

Mission drift occurs when MFIs migrate from their original social objective (poverty alleviation). Instead of focusing on the provision of financial services to improve the welfare of poor and low-income clients, MFIs go through the process of scaling-up their operations. The ultimate aim is to compete with the commercial banking sector and achieve greater financial sustainability. The social mission of MFIs is complex and requires a multifaceted approach. MFIs are often faced with the competing demands, not only from the clients that they serve, but also donors, board members, and a range of other stakeholders (Epstein & Yuthas, 2010). The analytical framework, designed by the author, is presented, on the proceeding page (Figure 2):

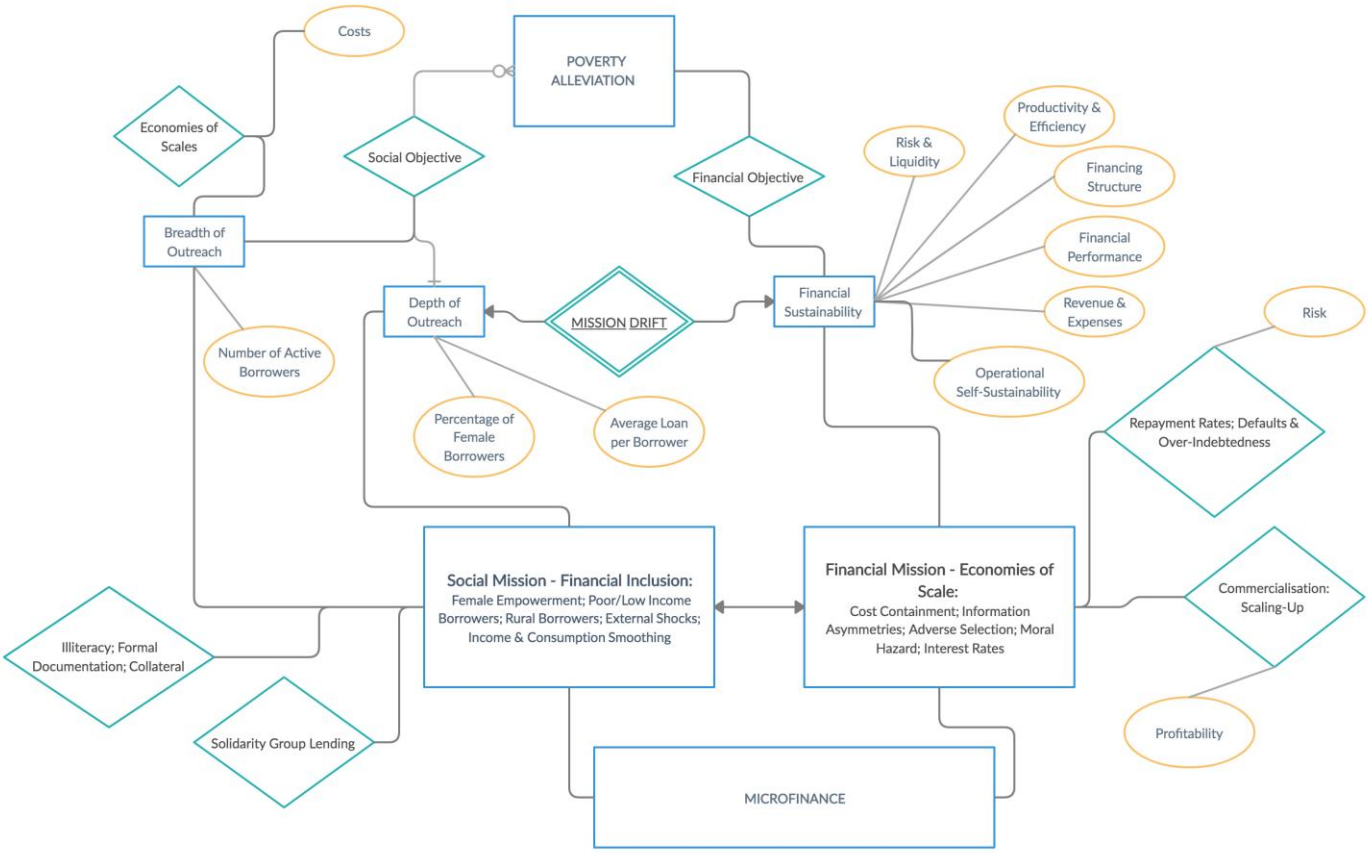
At a practical level, with the aim of cost containment and increasing profitability, mission drift takes the form of MFIs targeting clients that are nearer the poverty line (wealthier or less risky clients), geographically concentrated (e.g. urban), or are involved in highly profitable activities with a short production cycle (Bassem, 2012). At the client-level, evidence of mission drift can be seen through high drop-out rates and increasing indebtedness among clients (Epstein & Yuthas, 2010). Increasing outreach to the poor requires the administration of a larger amount of small loans. This could result in a higher cost per unit of loan and may hinder an MFIs opportunity to take advantage of economies of scale (Quayes, 2012).

Greater outreach could also be seen as leading to higher transaction costs, associated with obtaining the necessary information on client creditworthiness (information asymmetries), as MFIs may need to employ stricter loan-screening procedures (Kereta, 2007). They may also be exposed to greater risk of default or late repayments. Poorer clients may be more susceptible to, and less capable of dealing with, economic shocks as they generally invest in activities that have a lower rate of return (Quayes, 2012). Furthermore, poorer clients may

require greater levels of support from MFIs, due to issues surrounding illiteracy, access to formal documentation, and inexperience with the borrowing process (Gutiérrez-Goiria & Goitisolo, 2011).

The debate surrounding mission drift and MFIs should not be an “either-or " situation. Rather it should focus on the degrees to which MFIs experince mission drift and their strategies for resolving such trade-offs (Kar, 2010). Financial sustainability and outreach can be seen as complementary. As an MFIs client base increases, they can take advantage of economies of scale, reducing costs, and providing the foundation to become financially sustainable (Kereta, 2007).

Figure 7: Analytical Framework for Mission Drift



Financial sustainability can be the means to achieve greater outreach. Increased profitability of MFIs means that when donor subsidies are reduced or cease, their client base will not shrink. Therefore, they will not have to reduce their coverage of financial services to the poor in the future, which creates a sense of permanency for the institution (Borbora & Kumar

Sarma, 2011). Research shows that poor borrowers are much less inclined to default on their loans and generally exhibit high repayment rates, most likely due to the fact they have no other source of borrowing. This compensates for the higher costs associated with smaller loans, therefore depth of outreach could have a positive effect on financial sustainability of MFIs (Quayes, 2012).

3.2. Description of the Data

3.2.1. Source of Data & Sample Design

The data analysed in this study comes from Microfinance Information Exchange (MIX) database[15]. The MIX dataset was selected as it is the leading and most complete source of detailed, financial and social performance information on microfinance institutions at the regional, national and international levels (MIX et al., 2010). MIX's primary objective is to strengthen the microfinance sector by promoting transparency through the exchange of information across the world (Bassem, 2012).

The sample design for this study uses panel data and is a quantitative analysis composed of an unbalanced sample (certain years, the data category is not observed) of 52 microfinance institutions from the Middle East and North Africa region covering the period 2008 to 2017. MIX classifies MFIs within five diamond categories (from one to five diamonds) based on the reliability and quality of the information and the extent of disclosure. Every MFI included in the study has a disclosure level of 3 or higher.

The sample represents ten developing countries: Egypt, Iraq, Jordan, Lebanon, Morocco, Sudan, Syria, Tunisia, West Bank and Gaza, and Yemen[16]. The World Bank classifies each of the countries as either low-income or middle-income countries; with Yemen and Sudan belonging to the category of low-income countries[17].

[15] World Bank Open Data Catalog: https://datacatalog.worldbank.org/dataset/mix-market
[16] These were the only countires in the region, for which data was available.
[17] World Bank Country Income Classification: 2019-2020:

3.2.2. Selection of Dependent and Independent Variables

The average loan per borrower (LNBB) and the percentage of female borrowers (FMPWR) were selected as the dependent variables in this study. Average loan per borrower is the most widely used proxy for depth of outreach. The logic behind this variable is that the smaller the average loan size, the greater the depth of outreach (Hossain et al., 2020). This study selected average loan per borrower for the panel data estimations, as opposed to average loan per borrower/GNI per capita, because we are studying effects at the MFI-level (entity) and regional level. This study does not attempt to make cross-country comparisons for the two estimations. As women make up the majority of the world's poor, we use the percentage of female borrowers as an alternative proxy for depth of outreach, with the basic logic that the greater the share of female borrowers, the deeper the outreach of an MFI.

Independent variables selected for this study constituted determinants of financial performance, client structure, productivity and efficiency, risk and liquidity, financing structure, revenue and expenses. The selection of the independent variables proceeded through the following stages:

In the first stage, a large set of explanatory variables were drawn from existing literature on MFI mission drift, using a conceptual framework developed by the author. In the second stage, Pearson's Correlation Coefficient was performed to check if any independent variables were strongly correlated (>0.5) with each other. Some variables that showed strong correlation were excluded, whilst other strongly correlated variables of particular interest for the study, were kept for the next stage of analysis.

At the end of each model, a variance inflation factor (VIF) test was performed to check for multicollinearity. Any variable with VIF values greater than 10 were excluded from the final model. Furthermore, for the final model, any insignificant variables (at 10% significance level) were excluded, after again carefully consulting the existing theoretical and empirical literature. Lagged explanatory variables are used in this study in response to endogeneity concerns in the observational data (Bellemare et al., 2017).

The independent variables selected for the final models are presented in Table 2, along with the existing empirical evidence on their association with depth of outreach. In the sub-

sections below, I will briefly describe the key considerations relating to the inclusion and definition of these variables.

Table 2: Evidence of Relationship between Explanatory Variables and the Dependent Variables (Average Loan per Borrower & Percentage of Female Borrowers)

Independent Variable	**Empirical Evidence**
Financial Performance	
Operational Self-Sufficiency (OPSS)	(Nawaz, 2010); (Cull, Demirguc-Kunt, Morduch, 2011); (Roy & Pati, 2019); (Arrassen, 2017); (Sheremenko, Escalante, Florkowski, 2016); (Wagenaar, 2012); (Quayes, 2015)
Return on Assets (RTAS)	(Mia & Lee, 2017); (Hossain, Galbreath, Hasan et al., 2020); (Kar, 2013); (Berguiga, Said, Adair, 2017); (Nawaz, 2010); (Vanroose, D'Espallier, 2013); (Roy & Pati, 2019); (Strøm & Mersland, 2013)
Return on Equity (RTRE)	(Bassem, 2012); (Singh & Padhi, 2019)
Risk & Liquidity	
Portfolio-at-Risk, 30 Days (PATR)	(Mersland & Strøm, 2010); (Hossain, Galbreath, Hasan et al., 2020); (Roy & Pati, 2019); (Arrassen, 2017); (Sheremenko, Escalante, Florkowski, 2016)
Loan Loss Reserve Ratio (LNLR)	(Quayes, 2012); (Quayes, 2015)
Productivity & Efficiency	
Cost per Borrower (CTBR)	(Kar, 2013); (Adair & Berguiga, 2014); (Berguiga, Said, Adair, 2017); (Quayes, 2015)
Borrowers per Staff Member (BRWRST)	(Kar, 2011); (Singh & Padhi, 2019); (Nawaz, 2010); (Sheremenko, Escalante, Florkowski, 2016)
Financing Structure	
Debt-to-Equity ratio (DTEQ)	(Quayes, 2012)

Revenue & Expenses	
Profit Margin (PRFTMA)	(Adair & Berguiga, 2014); (Roy & Pati, 2019); (Hossain, Galbreath, Hasan et al., 2020); Mersland & Strøm, 2013)
Operating Expense/Assets (OPEXAS)	(Nawaz, 2010); (Hossain, Galbreath, Hasan et al., 2020); (Kar, 2010)

i. Financial Performance

The indicators selected to measure the overall financial performance/sustainability of MFIs are Operational Self-Sufficiency (OPSS), Return on Assets (RTAS), and Return on Equity (RTRE). These are the most common measures of MFI profitability. OPSS is a time-variant variable and is measured by Financial Revenue / (Financial Expense + Net Impairment Loss + Operating Expense)(MIX Market[18]). OPSS indicates the ability of an MFI to generate enough revenue to cover its total costs. Return on assets (RTAS) reflects an MFIs ability to use its assets productively to generate returns (Hossain et al., 2020). It is measured by (Net Operating Income - Taxes) / Average Total Assets (MIX Market[19]). Return on equity (RTRE) is measured as (Net Operating Income - Taxes) / Average Total Equity (MIX Market). Return on equity provides management with the rate of return on invested equity (Singh & Padhi, 2019).

An MFI is considered profitable if both its return on assets and return on equity are positive, and if it's OPSS is over 100% (Bassem, 2012). OPSS is seen as a better indicator for measuring MFI performance than RTAS or RTRE, as both RTAS and RTRE are generally self-reported and may be subject to manipulation by the accounting practices adopted by an MFI. Furthermore, RTAS may not include the value of donations, subsidies and inflation that MFIs should incorporate into this ratio (Kar, 2013).

ii. Risk & Liquidity

The variables that were selected to measure risk and liquidity are portfolio-at-risk, 30 days (PATR) and the loan loss rate (LNLR), both of which are expressed as percentages. Portfolio-at-risk, 30 days is a measure of an MFI's portfolio quality. PATR is defined as the fraction of the loan portfolio that is overdue past 30 days or more (Kar, 2010) and is a pessimistic

[18] Retrieved from **MIX Market Financial Performance Field Definitions**

estimate of the default risk in an MFI's loan portfolio (Singh & Padhi, 2019). Portfolio quality has been seen to have a strong influence on financial performance (Adair & Berguiga, 2010).

The loan-loss reserve ratio is defined as the loan-loss reserve as a fraction of loan portfolio and is used as an indicator of the anticipated loss from borrower defaults (Quayes, 2012). Therefore, LNLR should have an adverse effect on MFI financial performance. The loan loss reserve ratio is measured by (Write-offs - Value of Loans Recovered) / Average Gross Loan Portfolio (MIX Market). The link between the risk measures and social performance is ambiguous (Kar, 2013).

iii. Productivity & Efficiency

There is a lack of efficiency variables in the existing literature, needed to better understand cost drivers in MFIs (Roy Mersland & Strøm, 2010). Two measures have been chosen to measure the productivity and efficiency of MFIs. The first is the cost per borrower (CTBR), which is a proxy for cost-efficiency, and is measured as Operating Expense / Average Number of Active Borrowers (MIX Market). CTBR is the cost incurred by an MFI for each borrower to access loanable funds (Nawaz, 2010a). CTBR is generally presumed to be negatively associated with the financial performance of MFIs. We would expect CTBR to be positively related with depth of outreach (Kar, 2010).

The second measure is borrowers per staff member (BRWRST), a proxy for staff productivity, which is measured as number of Number of Active Borrowers / Number of Personnel (MIX Market). A higher ratio means that fewer employees are required to produce a given number of borrowers and is generally expected to be positively associated with financial self-sufficiency (Kar, 2010).

iv. Financing Structure

The debt to equity ratio (DTEQ) indicates the extent to which an MFI relies on debt financing and is an indicator of an MFI's leverage (Kar, 2010). DTEQ ratio is used as a standard measure to indicate the long-term financial health of an MFI. A larger level of equity is expected to have a positive effect on outreach and a negative impact on the financial performance of an MFI (Quayes, 2012).

v. Revenue & Expenses

The profit margin and the expenses/assets ratio are indicators of MFI revenues and expenses. Profit margin is an indicator of MFI revenue and profitability and is linked to the sustainability of MFIs (Roy & Pati, 2019). It is defined as Net Operating Income / Financial Revenue (MIX Market). By targeting poor clients, the profit margins of MFIs tend to decrease, with the relationship between financial sustainability and depth of outreach depending on the corporate governance of MFIs (Philippe Adair & Berguiga, 2014). The profit margin is likely to be positively associated with average loan size and OPSS (Roy & Pati, 2019). The operating expenses/assets ratio is expressed as Operating Expense / Average Total Assets (MIX Market). It is expected to have a negative influence on MFIs' performance (Hossain et al., 2020).

Table 3: Description of Dependent & Explanatory Variables[20]

Variable	Definition	Unit
Average Loan per Borrower (LNBB)	Loan portfolio divided by the number of credit clients	US$
Percentage of Female Borrowers (FMPWR)	Number of female borrowers divided by total number of active borrowers x 100	%
Operational Self-Sufficiency (OPSS)	Financial revenue divided by total expense that equals the sum of financial expense, loan-loss provision expense and operating expense.	%
Return on Assets (RTAS)	Net operating income – taxes/average total assets	%
Return on Equity (RTRE)	Net operating income, net of taxes/average total equity	%
Portfolio-at-Risk, 30 Days (PATR)	Portfolio at risk>30 days / loans portfolio	%
Cost per Borrower (CTBR)	Operating expenses / number of borrowers	US$
Borrowers per Staff Member (BRWRST)	Average number of active borrowers / average number of staff members/loan officers.	Number
Debt-to-Equity ratio (DTEQ)	Dividing total liabilities by total equity.	Ratio

[18] Table formulated by author using MIX Market data

Loan-Loss Reserve Ratio (LNLR)	Loan-loss reserve as a fraction of loan portfolio, is an indicator of anticipated loss from defaults	%
Profit Margin (PRFTMA)	Net operating income / operating revenue	%
Gross Loan Portfolio (GRLN)	All outstanding principals due for all outstanding client loans	US$
Operating Expense/Assets (OPEXAS)	Operating expenses to total assets	%
Number of Active Borrowers (ACBR)	The number of individuals who currently have an outstanding loan balance with the MFI or are primarily responsible for repaying any portion of the gross loan portfolio.	Number

3.3. Econometric Framework

The following sections present the implementation of the econometric models used in this study. Section 3.3.1 presents the theoretical implementation of the pooled OLS regression, fixed effects estimation and random effects estimation. The final section will present the final econometric models created for this study. The first model which uses a random effects estimation and the second model which uses fixed effects estimation.

3.3.1. Implementation of Models using Panel Data

This section shows the implementation of pooled ordinary least square, fixed effects and random effects estimations according to the procedures established by Baltagi (2005) and Cameron & Trivedi (2009). This study uses panel data which allows the inclusion of variables at different levels of analysis (MFI-level and regional levels) suitable for multilevel or hierarchical modeling. The first social performance model analyses depth of outreach, using average loan per borrower. The second social performance model will measure depth of outreach using the variable, percentage of female borrowers.

In the first stage of the methodology, a pooled OLS regression for each of the models is conducted to use for comparison purposes. In the second stage of the methodology, this study uses two estimation methods for each model: the fixed effects method (within) and random effects method (FGLS). Both of these methods take into account the heterogeneity of the data, but will differ regarding the nature of specific effects (Adair & Berguiga, 2014).

After both of the estimations have been performed, this study will use the Hausman specification test (1978) to capture the nature of these individual effects and help decide which of these two estimation methods – fixed or random – is appropriate for the data used in this study (Sevestre, 2002). If the probability test of the Hausman is over 5%, we will accept the null hypothesis, which is that the estimators of the two methods are convergent, but only the FGLS estimators are asymptotically efficient (Adair & Berguiga, 2014).

In the case where random effects are chosen by the Hausman test, we will use the Breusch-Pagan Lagrange multiplier (LM) is used, which helps to decide between random effects or a simple OLS regression. The null hypothesis for the LM test is that there is no significant variance (zero) across MFIs (i.e. no panel effect)(Torres-Reyna, 2007). A test for time-fixed effects is also performed in order to see if time-fixed effects are needed when running the fixed effects estimation. Finally, a Modified Wald test for groupwise heteroskedasticity is preformed in the fixed effect regression model.

For each of the panel data estimations, the explanatory variables are lagged variables (not the dependent variables), in response to endogeneity concerns in the observational data and to provide robust estimates for the effects of the explanatory variables. The current values of the dependent variables will be predicted based on both the current values and the lagged (past period) values of the explanatory variables..

The data used for the models is "strongly balanced", meaning each panel contains the same time points. Furthermore, "MFI" represents the entities or panels (i) and "Year" represents the time variable (t). The different models for the study are described below:

3.3.2. Implementation of the Pooled OLS Regressions

For the pooled OLS regression, we assume that the explanatory variables are non-stochastic and uncorrelated with the error term, therefore strictly exogenous (Gujarati et al., 2007) . The explanatory variables are assumed to be exogenous in nature and the error term is described as $\upsilon(it)$ rather than the term being decomposed into $\eta(i) + \xi(it)$. The pooled OLS regression method has been used in this study in order to analyse the depth of outreach of MFIs over the time period 2008-2017, through cross-sectionally arranging the data.

3.3.3. Implementation of Fixed Effects Estimations

Baltagi (2005) states that in the case of a fixed effect model, $\mu(i)$ are assumed to be fixed parameters that are to be estimated and $\chi(it)$ are assumed to be independently and identically distributed IID (0, $\sigma v2$). Furthermore, $\chi(it)$ are assumed to be independent of $\nu(it)$ for all *i* (MFI) and *t* (Year). Below, we present the general framework for an fixed effects model:

$$\gamma(it) = \alpha + \beta'\chi(it) + \mu(it) \qquad (1)$$

The error term can be decomposed as: $\mu(it) = \eta(it) + \nu(it)$

$\eta(it)$ represents the time invariant dimension of the model and accounts for any individual specific effect that is not taken into account within the panel regression model, while $\nu(it)$ indicates the remaining error term that varies over time, in addition to cross-sectionally (Baltagi, 2005).

With a fixed effects estimation we can account for both '*within* effects' and '*between* effects' estimations (Singh & Padhi, 2019). The within model is essentially found by subtracting the the time-averaged model away from the original model:

Time-Averaged Model (Cameron & Trivedi, 2009): $\overline{\gamma}(i) = \alpha(i) + \chi(i)\beta + \varepsilon(i)$

Original Model (Cameron & Trivedi, 2009): $\gamma(it) = \alpha(i) + \chi'(it)\beta$

Therefore, the within effects model is conceptualised: as: $\gamma(it) - \bar{\gamma}(i) = (\chi(it) - \bar{\chi}'(i))'\beta + (\varepsilon(it) - \bar{\epsilon}(it))$

We can see that the unobserved effect $\alpha(i)$ is removed, along with the time invariant regressors, due to the fact that: $\chi(it) - \bar{\chi}(i) = 0$ if $\chi(it) = \chi(i)$ for all t

The within effects estimator is considered a consistent estimator of the fixed effect model (Cameron & Trivedi, 2009). We use this within effects estimation to take into account the MFI-specific fixed effect, focusing on the time-series dimension of the dataset

(Singh & Padhi, 2019). The between effects estimation essentially shows us the means of MFIs over time, in order to analyse the cross-sectional nature of data (Singh & Padhi, 2019).

3.3.4. Implementation of Random Effects Estimations

By using random effects estimations, we are essentially combining features of both the within-effects estimation with the between-effects estimation. When using random effects estimations we presume that the error term $\mu(i)$ is presumed to be independent and identically distributed (IID) and $\mu(i)$ is assumed to be independent of $\nu(it)$ for all *i* and *t* (Baltagi, 2005)

.

Below we present the general framework for the random effects model:

$$\gamma(it) = \alpha + \beta'\chi(it) + \mu(it) \quad \text{where } \mu(it) = \mu(i) + \nu(it) \qquad (2)$$

$\mu(it)$ is essentially the between-MFI error and $\nu(it)$ is within-MFI error. The random effects estimations do not use dummy variables to capture the individual effect, rather it assumes that the individual effect is a random variable (Singh & Padhi, 2019). Despite the fact that both fixed and random adjust for unobservable MFI heterogeneity, in the fixed effects estimation, $\mu(i)$ is presumed to be fixed and requires estimating, while in the random effects model, we assume $\mu(i)$ to be random and is allowed to vary. We also assume $\mu(i)$ to be independent and identically distributed.

Therefore, the major difference between fixed and random effects estimations is that with random effects, variation across MFIs is assumed to be random with the explanatory variables included in the models. If we believe that there is some variation across MFIs that can have an effect on our dependent variables, it is better to use random effects.

3.3.5. Econometric Modelling for the Study

This study developed its econometric models for social performance based on the research of Adair and Berguiga (2014), who measured the social-financial performance nexus of MFIs. The econometric models presented in this study use strongly balanced panel data, with the variables average loan per borrower (LNBB) and percentage of female borrowers (FMPWR) as dependent variables. Both LNBB and FMPWR are measures of depth of outreach. The independent variables include indicators for financial performance, client structure,

productivity and efficiency, risk and liquidity, and financing structure which affect the outreach of MFIs. Many of the explanatory variables that are introduced control for the effect of the variable of interest: operational self-sustainability. The econometric models for this study are given below and a description of the variables is given in Table 3.

Model 1 ***(Depth 1)*****:** LNBB*(it)* = β0 + β1OPSS*(it-1)* + β2PATR*(it-1)* + β3CTBR*(it-1)* + β4PRFTMA*(it-1)* + β5OPEXAS*(it-1)* + $\mu(i) + \nu(it)$

Model 2 ***(Depth 2)*****:** FMPWR*(it)* = β0 + β1DTEQ*(it-1)* + β2OPEXAS*(it-1)* + β3BRWRST*(it-1)* + β4GRLN*(it-1)* + β5OPSS*(it-1)* + β6PATR*(it-1)* + β7RTAS*(it-1)* $+ \mu(it)$

3.3.6. Key Assumptions

According to (Torres-Reyna, 2007):

i. With the fixed effects estimation we assume that at the individual MFI level (entity), there may be something that impacts or causes bias in our dependent variables and therefore we must control for this. This is the basic logic behind the assumption that there is correlation between an MFI's error term and the dependent variable.

ii. With fixed effects estimations, time-invariant characteristics, being unique to each individual MFI, should not be correlated with other individual characteristics. Each MFI is different, therefore the MFI's error term and the constant (captures the individual characteristics) should not be correlated with other individual characteristics.

iii. With random effects estimations, in contrast to fixed effects estimations, variation across MFIs is assumed to be random and uncorrelated with the explanatory variables included in the model.

iv. Random effects estimations assume the MFI's error term is not correlated with the explanatory variables, therefore allowing time-invariant variables to have a role as explanatory variables .

3.3.7. Limitations of the Study

i. The panel data estimations are limited by time-frame (2008-2017) and by the quality and availability of data for the respective years chosen, which led to this study using

an unbalanced panel dataset. However the missing data is assumed random and it was deemed an advantage to use as large a sample as possible for the study.

ii. With the panel data estimations we are likely to face issues with serial autocorrelation within the panels from one time period to the next (Kar, 2013), as well as possible issues with multicollinearity and heteroskedasticity in relation to the variables used in the study.

iii. With the random effects estimation there is the problem of bias that partial pooling can introduce.

iv. With fixed effects estimations, the number of unknown parameters increases with the number of sample observations and we cannot estimate coefficients that vary over time (Hsiao, 2007).

3.4. Stata Implementation

To set Stata to deal with panel data the command ‘xtset’ is used. The command ‘pwcorr’ is used in order to pairwise correlation coefficients between the variables in the variable list. For the pooled OLS regression the command ‘regress’ is used, followed by ‘vce(cluster i)’. The command to run fixed/random effects is ‘xtreg’, followed by ‘fe’ and ‘re’ at the end of the regression, for fixed and random effects respectively. After both the fixed and random effects estimations are preformed, the command ‘estimates store’ is used to retain the regression results, in order to perform the Hausman test which is ‘hausman fixed random’. Breusch-Pagan Lagrange multiplier (LM) test is used for random effects, performed by “xttest0”. For fixed effect estimation, the command “xttest” is used in order to test for heteroskedasticity. The command ‘robust’ is used as a robust variance estimator and the command ‘vce (robust)’ controls for robust/clustered standard

CHAPTER IV: RESULTS & DISCUSSION

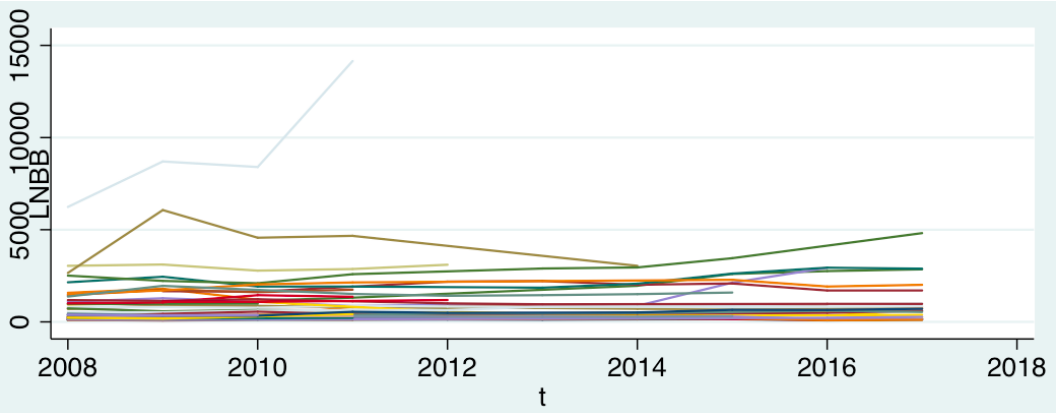
4. Results & Discussion

The first part of this chapter presents the descriptive statistics for the models, with a particular focus on the two dependent variables, average loan per borrower (LNBB) and percentage of female borrowers (FMPWR), and their variability over the time-frame of this study. Following on from this, a brief study of variables of interest from the summary statistics for the determinant variables is presented. The proceeding parts of this section discuss the econometric analysis of the study, in particular the results of the fixed effects and random effects estimations. The chapter concludes with a description of the robustness checks used in the study.

4.1. Descriptive Statistics

In Figure 1, it is apparent that the average loan size for the vast majority of MFIs in the MENA region is small (well over 90% are between $1000 and $5000). Table 4 shows that the average loan size for the region is just over $900, meaning that in general, MFIs are lending smaller amounts. Smaller average loans are associated with greater outreach to the poor, as the poor in general take smaller loans. Furthermore, Figure 1, shows that the majority of MFIs in the region have greater than 50% of their clients as female. As women make up the majority of the world's poor, MFIs in the MENA region perform well in relation to one aspect of depth of outreach. Table 5 shows the mean percentage of female borrowers is 62%, meaning that on average, MFIs in the region are mostly serving women borrowers.

Figure 8: Distribution of Average Loan per Borrower for each MFI (Model 1), 2008-2017



After this initial analysis of the dependent variables that represent depth of outreach, MFIs in the region seem to be comfortably meeting their social objective of reaching the poor. Figures 6 and 7 represent the change in average loan size and the percentage of female borrowers overtime for each MFI. Figures 8 and 9 represent the change in the determinant variables of overtime for each MFI in our sample. Figures 6 shows that the change in the average loan per borrower has been reasonably constant over the 10 year period. However, there is a growing trend that average loan size is increasing for many MFIs since 2016, which is a cause for concern, in realtion to mission drift.

Figure 9: Distribution of Percentage of Female Borrowers for each MFI (Model 2), 2008-2017

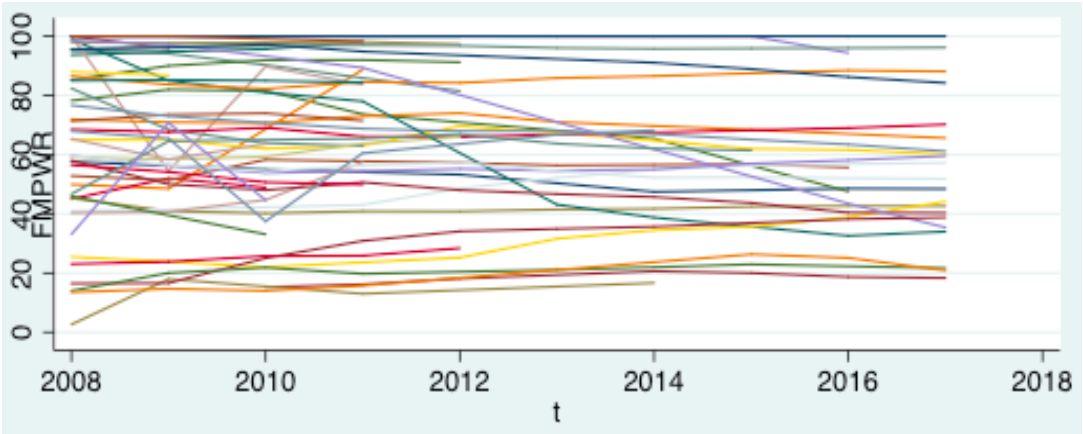


Figure 7, shows that there is a lot more variability in relation to the percentage of female borrowers being served by MFIs in the region. However, most MFIs borrowers are female in the region, and this trend is reasonably constant over the time-frame, except for a few outlier MFIs, that have significantly reduced their percentage of female borrowers.

Figure 10: Histograms comparing the distribution of the dependent variables: LNBB & FMPWR

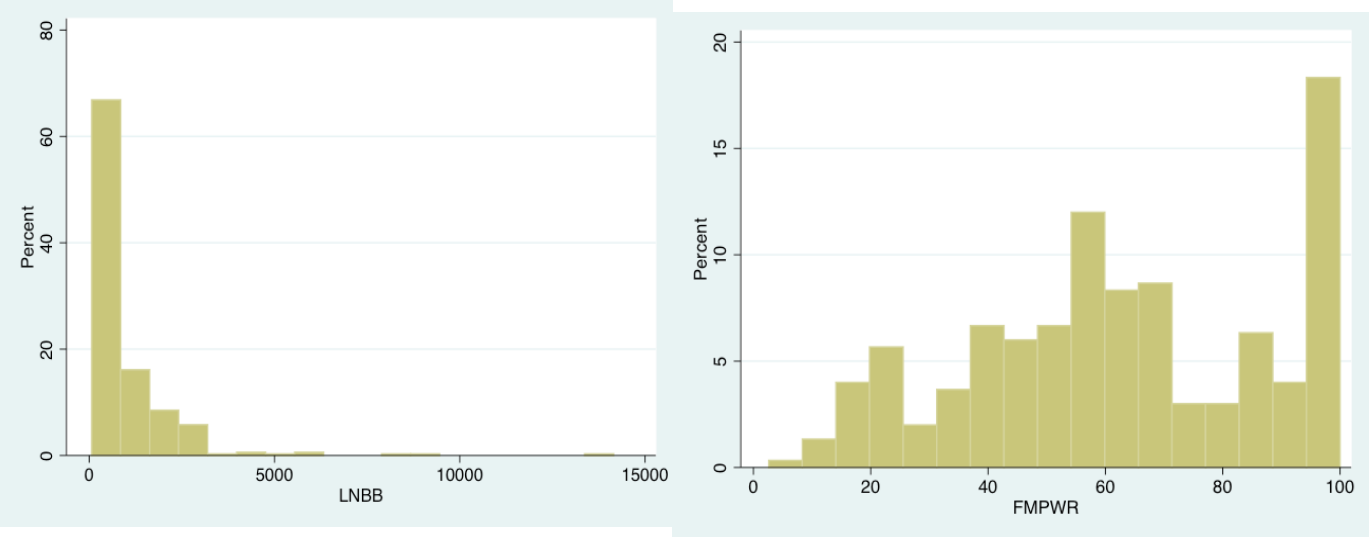


Table 4: Summary statistics of the dependent variable, average loan per borrower, at the MFI level

Variables	Obs	Mean	Std.Dev.	Min	Max	p1	p99	Skew.	Kurt.
LNBB	329	933.596	1329.962	65	14152	96	6235	4.885	38.844

Table 5: Summary statistics of the dependent variable, percentage of female borrowers, at the MFI level

Variables	Obs	Mean	Std.Dev.	Min	Max	p1	p99	Skew.	Kurt.
FMPWR	300	62.558	25.582	2.613	100	13.755	100	-.132	2.038

For the fixed effects model used in Model 1, Figure 10 and Figure 11 observe the heterogeneity (unobserved variables that do not change over time) of the dependent variable (average loan per borrower) across MFIs and years, respectively. Figures 10 and 11 show that MFIs in the region, minus a few outliers, are consistently providing smaller loans, thereby reaching clients from the poorest segments of the population. For the fixed effects estimation for Model 2, Figure 11 and Figure 12 observe the heterogeneity of the dependent variable (percentage of female borrowers), across MFIs and across years, respectively. Figure 11,

shows the heterogeneity of the percentage of female borrowers across MFIs is very scattered, but shows that the majority of MFIs still serve a large number of female clients.

However, there is cause for concern, that there are still many MFIs in the region that do provide services to a larger percentage of female borrowers. This variability in the percentage of female borrowers for MFIs in the region is again seen by Figure 7. Consistency among MFIs would be beneficial in order to actively promote depth of outreach, through attracting more female clients at the regional level. The mean number for the percentage of female borrowers has steadily declined over the last 10 years (Figure 14). Perhaps this is an indication that MFIs, are moving towards a trend of focusing less on female borrowers, which would have a negative effect on MFIs' depth of outreach.

Table 6 shows the descriptive statistics for the explanatory variables used in both the first estimation (random effects) and the second estimation (fixed effects). This study will proceed to highlight variables of interest to explain the financial health of MFIs in the MENA region. It is interesting to note that MFIs in the MENA region are on average operationally self-sustainable (144%), meaning they are comfortably able to cover their operating costs with their revenues. Furthermore, this is evidence that MFIs have a positive net income, which may show they rely less on donor subsidies, in order to compensate potential operational losses. In relation to profit margins, MFIs have an average level of profit (nearly 10%) for a small enterprise (Parker, 2019), however given their dual objectives, it may be possible to assume that 10% for an MFI is actually relatively high for institutions of this type.

Table 6: Descriptive Statistics for the Explanatory Variables (Detailed)

Variable	Obs	Mean	Std.Dev.	Min	Max
OPSS_l	328	144.142	213.215	13.01	3662.66
RTAS_1	312	3.674	7.075	-33.4	29.38
RTRE_1	312	4.528	52.341	-435.04	191.72
PATR_1	291	5.139	8.381	0	72.52
CTBR_1	307	148.463	187.327	3	1918
BRWRST_1	321	135.913	66.451	0	444
DTEQ_1	330	3.82	34.317	-28.17	611.82
LNLR_1	309	1.292	4.294	-14.69	44.46
PRFTMA_1	328	9.859	55.184	-668.54	195.58
GRLN_1	342	3.50e+07	5.63e+07	171000	3.48e+08
OPEXAS_1	312	15.987	7.948	.09	50.68
ACBR_1	332	63275.25	89283.51	399	472000

Portfolio-at-risk has traditionally been far lower in MFIs, than in the commercial banking sector. The mean portfolio-at-risk for the region is low at around 5%. Usually, within the microfinance sector, anything greater than 10% is a cause for concern as MFIs are not backed by bankable collateral (Von Stauffenberg et al., 2003). Von Stauffenberg et al., (2003), in their study of Latin American MFIs, found that leading MFIs usually show portfolios at risk of 1-6%, so we can safely assume that MFIs in the MENA region have high quality loan portfolios. However, we also must take into account the fact that portfolio-at-risk may be underestimated by the institutions.

Return on equity (RTRE) measures the return on investment of MFIs. Since the vast majority of MFIs in the region are NGOs, return on equity can be used as a proxy for commercial viability (Omri & Chkoundali, 2011). The mean RTRE value for MFIs in the region is very low at 4.52%, which could be a sign that MFIs may still be reliant on donations and subsidies. However, this measure is often misleading, as it fails to take into account extraordinary revenues or losses, for example assets sales or under-provision. Return on assets (RTAS) measures how efficiently MFIs use their assets. Due to the limited funding options from financial and capital markets for NGO MFIs in the region, they often rely heavily on their retained earnings in order to grow (Muriu, 2011). The RTAS value for the region is 3.67% which is typically average for the sector and represents a profitability that is well above what is typical for the commercial banking sector (Von Stauffenberg et al., 2003).

The number of active borrowers of an MFI is every individual client who has at least one current outstanding loan with the MFI (MIX Market). The mean number of active borrowers for the region was around 63,275 with the smallest MFI in the sample reaching just 399 borrowers and the largest MFI in the sample reaching 472,339.

The borrowers per staff member ratio essentially calculates the staff productivity of an MFI. The higher this ratio the more productive is an institution. It is a useful measure to analyse the lending procedures and processes, as low productivity does not necessarily mean that staff work less, but may be tied up in more bureaucratic elements of the MFIs, such as paperwork, etc. (Von Stauffenberg et al., 2003). In order to strive for financial viability, MFIs must serve as many clients as possible, with as little bureaucracy, and without allowing portfolio quality to suffer. At approximately 136 borrowers served per staff member, MFIs in the region are in line with averages of the study of Von Stauffenberg et al., (2003).

Operating expense ratio is one of the best indicators to study the overall efficiency of MFIs as it is measures the cost to MFIs of the provision of loan services. It excludes interest and provision expenses, as well as extraordinary expenses. In basic terms, the lower the operating expense ratio, the higher the efficiency of an MFI. Von Stauffenberg et al., (2003) shows that leading Latin American MFIs would easily have an operating expense ratio of less than 20%. In the MENA region the mean operating expense ratio is 15%, meaning MFIs in the region are highly efficient.

The debt-to-equity ratio essentially measures the overall leverage of an institution and is the best indicator of the capital adequacy of an MFI. The debt-to-equity ratio shows how much of a cushion an MFI has (in relation to their equity) to absorb losses. It is essential for MFIs in the MENA region to keep their debt-to-equity ratio low, due to their limited ability to borrow from commercial sources. However, this ratio increases rapidly as MFIs become more regulated. As microloan portfolios are backed by less collateral, even highly leveraged MFI carry less debt than conventional banks (Von Stauffenberg et al., 2003). Rapidly increasing debt-to equity ratio may be evidence of MFIs reaching their borrowing limit, which may require it to curtail growth. Regulated MFIs are able to better access commercial sources of funding and therefore usually have higher debt-to-equity ratios. The debt-to-equity ratio for the region is approximately 3.8, which is low, and could point to the fact that the vast

majority of MFIs in the region are non-profit, due to a lack of enabling regulations in MENA for MFIs to commercialise.

Finally, the loan-loss ratio is another measure of risk and liquidity within the sector, which indicates the number of loans that MFIs believe will not be recovered. The indicator varies widely across MFIs, and is usually higher than the portfolio at risk. We use loan/loss ratio in the context of this study as a control indicator which will allow us to better understand portfolio-at-risk. The mean value of loan-loss ratio for the MENA region is very low at around 1.3%, which means MFIs in the region do not struggle with loan delinquency. In relation to the long-term financial health of MFIs in the region, the mean debt-to-equity ratio is also very low (3.82%), meaning institutions are financially healthy.

The econometric analysis of this study is be presented in two parts, each of which will present the results of the estimations on both of the dependent variables. Section 4.2. provides the results of the random effects estimation. Section 4.3. provides the results of the fixed effects estimation.

4.2. Random Effects Estimation Results (Model 1)

Random effects estimation was chosen for the first model with average loan per borrower as the dependent variable. After running a pooled OLS regression for Model 1 (Appendix 1), the study preforms both fixed (Appendix 2) and random effects (Appendix 3) estimations, storing these estimates, and applying the Hausman test (Appendix 4) in order to decide which method was more appropriate. The null hypothesis for the Hausman test is that the preferred model is random effects versus the alternative hypothesis which is that fixed effects are preferred (Torres-Reyna, 2007). The Hausman test shows whether the unique errors $\mu(it)$ are correlated with the explanatory variables, with the null hypothesis being that they are not. As can be seen from Appendix 4, the Prob>chi2 value is 0.094, which is greater than 0.05 (i.e. not significant) so we chose the random effects model.

Following the selection of the random effects model, we performed a Breusch-Pagan Lagrange multiplier (LM) test to decide between using random effects estimation or simple OLS regression. For the LM test the null hypothesis is that the variances across MFIs is zero, in other words there is no panel effect. In Appendix 5 we can see the results of the LM test,

the Prob>chibar2 result is 0.000 which means we accept that the null hypothesis that random effects is the appropriate estimation to use for Model 1.

Finally, we run a robust version of our final random effects model in order to control for heteroskedasticity. Appendix 6 presents the final results from the random effects model. As can be seen from the results of the estimation, operational self-sustainability is highly significant (P>|t| 0.000) and positively associated with average loan per borrower. This shows that as average loan size increases, so too does the operational self-sustainability (OPSS) of MFIs in the region. OPSS measures whether MFIs are able to cover their operating costs through the revenues received from their lending activities. MFIs lend higher average loan sizes to 'better off" borrowers as they are considered less risky and more profitable borrowers. This is a sign of mission drift, as MFIs search to become more profitable at the expense of providing small loans to poorer borrowers. Furthermore, higher average loan sizes could be an indicator that MFIs in the region are seeking to go through the process of commercialisation, are achieveing greater scale and becoming regulated financial intermediaries.

As discussed in the review of the empirical literature in Section 2.2, smaller loan sizes could be associated with lower profitability, and higher costs per dollar lent. However, as Adair & Berguiga (2014) have found, MFIs in the MENA region may decrease their depth of outreach in the short term in order to secure payback. Furthermore, there could be spill-over effects from achieving operational self-sustainability that would allow MFIs to make greater strides toward poverty alleviation in the long term. Portfolio-at-risk was significant (P>|t| 0.006) and has a strong negative effect on the average loan per borrower. Therefore, as the average loan per borrower increases, the portfolio-at-risk of an MFI significantly decreases. A lower portfolio at risk is linked to larger loan size and better sustainability, due to less risk exposure (Roy & Pati, 2019).

Cost per borrower was found to be significant (P>|t| 0.000) and positively associated with average loan per borrower. This means that as average loan size increases there was a significant rise in the cost per borrower. MFIs that provide larger loans require a higher quality of service, which can lead to higher costs (Nawaz, 2010). The terms and conditions of small loans are standardized and routine, and so have a lower cost per borrower (Quayes, 2012). Furthermore, it could be argued that there is a need for MFIs that target very poor

borrowers to be as cost-efficient as possible. This to enable MFIs to provide a large number of small loans, which in a way could neutralize the effect of loan size (Mersland & Strøm, 2010).

The variable profit margin was highly significant (P>|t| 0.000) and has a negative effect on the average loan per borrower. Therefore, as average loan size per borrower increases, profit margins actually decline. This is a slight surprise, as we would normally associate larger loans with higher profitability. However, we could predict that there may be initially higher costs for MFIs to provide larger loans, as borrowers expect a higher quality of service. Furthermore, MFIs would in effect have to adopt a new set of procedures and processes in order to meet the needs of this new client base. This result may also be evidence that MFIs do not have to aim to provide higher loans in order to turn a profit.

Finally for Model 1, the operating expense/assets ratio is highly significant (P>|t| 0.000) and is strongly negatively associated with average loan per borrower. Therefore, as average loan size increases, the operating expenses/assets ratio significantly decreases. This means that a larger loan size enables MFIs to cover their costs more effectively. Perhaps MFIs are able to build up a greater asset base through becoming more profitable.

4.3. Fixed Effects Estimation Results (Model 2)

The second model uses the percentage of female clients as the dependent variable. Again, a pooled OLS regression is preformed for comparison (Appendix 7). Then, both the fixed (Appendix 8) and random effects (Appendix 9) estimations were performed and stored, before performing the Hausman test. Appendix 10, shows the result of the Hausman test is Prob>chi2 is 0.0001, which is less than 0.05 (i.e. significant), so for this model we use a fixed effects estimation.

As fixed effects was determined to be the most appropriate estimation, this study tested for time-fixed effects. This is a joint test in order to see if the dummies for all years are equal to 0 (Torres-Reyna, 2007). If they are, then we do not require time fixed effects. Appendixes 11 and 12 show the results of the time-fixed tests. Appendix 12 shows the results from the Wald test is Prob > F = 0.5642, which is greater than 0.05, so we failed to reject the null hypothesis that the coefficients for all years are jointly equal to zero. Therefore, no time-fixed effects are needed in this case. A modified Wald statistic for groupwise heteroskedasticity

(Appendix 13) was performed afterwards on the fixed effects estimation to test for heteroscedasticity. Finally, the final fixed effects estimation uses robust/clustered standard errors to control for heteroscedasticity and autocorrelation (Appendix 14).

Appendix 14 presents the final results of the fixed effects estimation. The variable cost per borrower (BRWRST) is significant (P>|t| 0.036) and weakly-positively associated with the percentage of female borrowers. Therefore, as MFIs cater to more female borrowers, their costs increase. This could be due to the fact that female borrowers generally take smaller loans, which leads to less profitability and perhaps a higher cost per unit loan.

However, these "added costs" will be compensated by the fact female borrowers post high repayment rates. The variable operational self-sustainability was also significant (P>|t| 0.036) and again weakly, positively associated with the percentage of female clients. This is a promising result, as it proves, albeit with small effects, that MFIs can still expand their depth of outreach (by targeting female borrowers), without negatively affecting their financial sustainability. This is important, as it shows that MFIs in the region are not experiencing mission drift as they are providing loans to poorer sections of the population, whilst remaining financially viable

4.4. Robustness Checks

This study performs a pooled OLS regression for each model in order to compare the results with the fixed and random effects estimations. For the pooled OLS regressions, we use clustered sandwich estimators, which account for residual autocorrelation. As the panel dataset for this study has a large N (number of observations) and a small T (time-period), robust/clustered standard errors are used for the fixed effects estimation, to control for both heteroskedasticity and autocorrelation.

Furthermore, for the random effects estimation, the Huber/White/sandwich robust variance estimator is used to control for heteroskedasticity. Additional robustness checks were also conducted by dropping return on equity, loan loss reserve ratio, and number of active borrowers in the linear specification of the model, as well as in the fixed and random effects estimations. Finally, for the fixed estimation, the log lagged, explanatory variables (Appendix 15) was taken and compared with the robust version of estimation, with the robust model being superior.

CHAPTER V: CONCLUSIONS & RECOMMENDATIONS

5. Conclusions & Recommendations

The first section of this chapter will provide the concluding remarks to this study, providing a brief overview of the study's framework and the final results. The second section will provide some recommendations for MFIs in the MENA region to expand their depth of outreach and avoid mission drift.

5.1. Conclusions

The purpose of this panel study was to quantify, using fixed and random effects estimations, whether the financial sustainability of MFIs in the Middle East and North Africa region has an effect on the MFIs' depth of outreach to the poor (measured by average loan size per borrower and the percentage of female clients). This study, covering 2008-2017, attempted to investigate whether MFIs in the region experience mission drift, excluding poor borrowers (social objective) from financial access in the search of greater financial sustainability (financial objective).

This study found that MFIs can significantly improve their financial sustainability, especially their portfolio quality, through the provision of larger loan sizes to borrowers. However, this is associated with higher costs and lower profits, but perhaps just in the short-term in order to meet the needs of a new client base. However, the provision of larger loans is an indicator of mission drift. Therefore, by striving for financial self-sustainability, MFIs in MENA may be targeting "better off" clients nearer the poverty line through the provision of these larger loans. This could have the effect in the future of excluding the poorest segments of the population from access to financial services. However, larger loans could be the foundation for borrowers with perhaps more entrepreneurial skills to expand and grow their businesses. This in turn would be positive for the economy as a whole, especially in addressing the high unemployment rates in the region.

This study also finds that there is a weak, positive association between the percentage of female borrowers and both operational sustainability and staff productivity. Despite these effects only being marginal, it can be safely said that the provision of financial services to more female borrowers will not have an adverse effect on the financial sustainability of

MFIs, but most likely will improve it. Therefore, the results of this study can not definitively determine whether MFIs in MENA experience mission drift.

This study is one of the few, as well as one of the most recent studies, that addresses mission drift in the MENA microfinance sector. This study only includes self-reported data for MIX and does not include macro-level determinants, which limits country-level analysis. It did not include any control variables for lending methodology or legal status. Future studies could consider the percentage of loans that go directly to the poor and focus on the effect of interest rates charged by MFIs and their trends over time. There is also a need for more qualitative research to be conducted at the country-level in the MENA region. Finally, it would be of interest to study the social performance of MFIs in MENA that have actually gone through the commercialization process to become for-profit MFIs.

5.2. Recommendations

This study recommends the following for the national financial inclusion strategies of MENA countries, as well as the Arab Monetary Fund.

1. **Branchless Banking & Digital Financial Services**

Branchless banking is an innovative and efficient channel through which to provide financial access for those excluded from the traditional banking sector in the MENA region. Branchless and digital banking can counteract the high transaction costs and a lack of retail infrastructure of traditional banking. In particular, the MENA region has high market penetration rates for mobile phones, much more than the penetration rates for bank accounts (Akhtar & Pearce, 2010). However, it would also require the necessary regulation reform within the region, which is so severely lacking in the majority of countries (Scola, 2012).

2. **Islamic Microfinance in MENA region**

Almost a third of Muslim countries' populations are living below the international poverty line ($2 per day), and account for more than 660 million people (Clarke & Tittensor, 2016). A large proportion of the poor in the MENA region are practicing Muslims. They are unable to avail of conventional microfinance contracts as they are incompatible with principles of Islamic law, Sharia, which prohibits any rate of return on financial transactions (Abdelkader & Salem, 2013). The expansion and integration of Sharia compliant microfinance services

(nascent stage) into the conventional microfinance sector of MENA is essential to expand the depth and breadth of outreach to the poorest of the region.

3. Diversification and Expansion of Financial and Non-Financial Services

There is a huge unmet demand for local savings and deposit services in the region due to restrictions in legislation, with only three countries (Yemen, Syria, Palestine) allowing MFIs to offer savings (MIX et al., 2010). MFIs that collect savings have greater breadth of outreach and savings allow low-income clients to establish formal financial records. Furthermore, other products such as micro-insurance schemes are still in their nascent stage, as innovation in the MENA microfinance sector tends to be slow (Soltane Bassem, 2014). Savings and micro-insurance enable clients to smooth consumption and guard against income shocks in the future. Finally there is the need for the expansion of well-designed, non-financial services (literacy programmes, technical training, etc.) that focus on empowering women and young people, to improve their standard of living.

4. Strong Legal and Regulatory Frameworks that Support Commercialisation

MFIs in the MENA region have low technical and managerial capacity, insufficient resources and inadequate physical and legal infrastructure (Ben Abdelkader & Mansouri, 2019). The legal and institutional framework for secured transactions, including procedures for collateral enforcement needs strengthening (Akhtar & Pearce, 2010). There needs to be a balance in the MENA region between control and oversight, as well as between subsidies and market-driven development (Rocha, 2011). A lack of regulatory and supervisory clarity has led to poor investment in MFIs in the MENA region. Competent risk management practices are needed in the region to limit client over-indebtedness, which was prevalent in high growth markets in the past, in particular Morocco (MIX et al., 2010). Finally, it is important that MFIs in the region participate in credit-information reporting schemes to credit bureaus, in order to improve the quality and availability of client information (MIX et al., 2010).

REFERENCES

Abdelkader, I. B., & Salem, A. B. (2013). Islamic vs Conventional Microfinance Institutions: Performance analysis in MENA countries. *International Journal of Business and Social Research (IJBSR)*, *3*(5), 219–233. https://doi.org/10.18533/ijbsr.v3i5.21

Adair, P., & Berguiga, I. (2010a). Les facteurs déterminants de la performance sociale et de la performance financière des institutions de microfinance dans la région mena- Une analyse en coupe instantanée. *Région et Développement*, *32*, 91–119. https://www.researchgate.net/profile/Imene_Berguiga/publication/260086634_Les_facteurs_determinants_de_la_performance_sociale_et_de_la_performance_financiere_des_institutions_de_microfinance_dans_la_region_mena_Une_analyse_en_coupe_instantanee/links/0a85e

Adair, P., & Berguiga, I. (2010b). Les facteurs déterminants de la performance sociale et de la performance financière des institutions de microfinance dans la région MENA: une analyse en coupe instantanée. *Région et Développement*, *32*, 91–119. https://www.researchgate.net/profile/Imene_Berguiga/publication/260086634_Les_facteurs_determinants_de_la_performance_sociale_et_de_la_performance_financiere_des_institutions_de_microfinance_dans_la_region_mena_Une_analyse_en_coupe_instantanee/links/0a85e

Adair, Philippe, & Berguiga, I. (2014). How do social and financial performance of microfinance institutions interact? A panel data study upon the MENA region (1998-2011). *Source: Savings and Development*, *38*(1), 7–26. https://doi.org/10.2307/savideve.38.1.7

Adair, Philippe, & Berguiga, I. (2015). The interest rates and performance of MFIs in the MENA region: is there a moral issue? *Éthique et Économique*, 45. http://ethique-economique.net/

Adjei, J. K. A. (2009). *Microfinance Programmes and the Poor : Whom Are They Reaching? Evidence from Ghana (BWPI Working Paper 72)*. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.539.354&rep=rep1&type=pdf

Adjei, J. K., Arun, T., & Hossain, F. (2009). *The Role of Microfinance in Asset-Building and Poverty Reduction : The Case of Sinapi Aba Trust of Ghana*. https://www.mendeley.com/viewer/?fileId=7feded1c-f65d-a503-0df3-28028601e043&documentId=fc626224-773f-3e33-a353-fb6e7d69c859

Akhtar, S., & Pearce, D. (2010a). Microfinance in the Arab World: The Challenge of Financial Inclusion. In *MENA knowledge and learning quick notes series* (Vol. 25).

World Bank. http://documents.worldbank.org/curated/en/265691468170972197/pdf/554590BRI0Quic10Box349454B01PUBLIC1.pdf

Akhtar, S., & Pearce, D. (2010b). Microfinance in the Arab World: The challenge of financial inclusion. In *MENA Knowledge and Learning: Quick Notes Series* (Issue 25). World Bank.

Al-Azzam, M. (2019). Financing microfinance institutions: subsidies or deposit mobilisation. *Applied Economics*, *51*(15), 1621–1633. https://doi.org/10.1080/00036846.2018.1527467

Allison, P. D. (2009). *Fixed effects regression models (Vol. 16)*. SAGE publications.

Armendáriz, B., & Szafarz, A. (2011). Microfinance Mission Drift? In A. Beatriz & L. Marc (Eds.), *The handbook of microfinance* (pp. 341–366). World Scientific.

Arrassen, W. (2017). The determinants of MFIs' social and financial performances in sub-Saharan Africa: has mission drift occurred? *Annals of Finance*, *13*(2), 205–235. https://doi.org/10.1007/s10436-017-0296-x

Aveh, F. K., Krah, R. Y., & Dadzie, P. S. (2013). An Evaluation of Sustainability and Subsidy Dependence of Microfinance Institutions in Ghana. *International Business and Management*, *6*(1), 55–63. https://doi.org/10.3968/j.ibm.1923842820130601.1090

Ayayi, A. G., & Sene, M. (2010a). What drives microfinance institution's financial sustainability. *The Journal of Developing Areas*, 303–324. https://about.jstor.org/terms

Ayayi, A. G., & Sene, M. (2010b). WHAT DRIVES MICROFINANCE INSTITUTION ' S FINANCIAL SUSTAINABILITY Author (s): Ayi Gavriel Ayayi and Maty Sene Source : The Journal of Developing Areas , Vol . 44 , No . 1 (Fall 2010), pp . 303-324 Published by : College of Business , Tennessee State U. *The Journal of Development Areas*, *44*(1), 303–324.

Aziz Atamanov, & Sharad Tandon. (2018, November 27). *Measuring regional poverty in MENA: Update and remaining challenges*. World Bank Blogs. https://blogs.worldbank.org/arabvoices/measuring-regional-poverty-mena-update-and-remaining-challenges

Baltagi, B. H. (2005). *Econometric analysis of panel data* (3rd ed.). England JW & Sons.

Bassem, B. S. (2012). Social and Financial Performance of Microfinance Institutions: Is there a Trade-Off? *Journal of Economics and International Finance*, *4*(4). https://doi.org/10.5897/jeif11.129

Bellemare, M. F., Masaki, T., & Pepinsky, T. B. (2017). Lagged explanatory variables and

the estimation of causal effect. *Journal of Politics*, *79*(3), 949–963. https://doi.org/10.1086/690946

Ben Abdelkader, I., & Mansouri, F. (2019a). Performance of microfinance institutions in the MENA region: a comparative analysis. *International Journal of Social Economics*, *46*(1), 47–65. https://doi.org/10.1108/IJSE-06-2017-0242

Ben Abdelkader, I., & Mansouri, F. (2019b). Performance of microfinance institutions in the MENA region: a comparative analysis. *International Journal of Social Economics*, *46*(1), 47–65. https://doi.org/10.1108/IJSE-06-2017-0242

Berguiga, I., Adair, P., & Said, Y. Ben. (2017). *The social and financial performance of Microfinance institutions in the MENA region: Do Islamic institutions perform better?* https://hal-upec-upem.archives-ouvertes.fr/hal-01667406

Bibi, U., Balli, H. O., Matthews, C. D., & Tripe, D. W. L. (2018). Impact of gender and governance on microfinance efficiency. *Journal of International Financial Markets, Institutions and Money*, *53*, 307–319. https://doi.org/10.1016/j.intfin.2017.12.008

Bolze, L. (2017, October 4). How Can Microfinance Institutions in the Middle East and North Africa Manage Risk and Meet Client Demand? Governance Is Key! *Accion International: Center for Financial Inclusion*. https://www.centerforfinancialinclusion.org/how-can-microfinance-institutions-in-the-middle-east-and-north-africa-manage-risk-and-meet-client-demand-governance-is-key

Borbora, S., & Kumar Sarma, G. (2011a). Is Microfinance Outreach Sustainable? A Case of Microfinance Institution Model in India. In A Case of Microfinance Institution Model in India. *Second European Research Conference on Microfinance*. https://www.researchgate.net/publication/234001987

Borbora, S., & Kumar Sarma, G. (2011b). *Microfinance Institutions: Sustainability and Outreach*. https://www.researchgate.net/publication/234001987

Bos, J. W. B., & Millone, M. (2015). Practice What You Preach: Microfinance Business Models and Operational Efficiency. *World Development*, *70*, 28–42. https://doi.org/10.1016/j.worlddev.2014.12.018

Cameron, A. C., & Trivedi, P. K. (2009). *Microeconometrics using stata* (5th ed.). Stata Press.

Chakravarty, S., & Pylypiv, M. I. (2015). The Role of Subsidization and Organizational Status on Microfinance Borrower Repayment Rates. *World Development*, *66*, 737–748. https://doi.org/10.1016/j.worlddev.2014.09.007

Chamberlain, E. (2015). *Microfinance in Algeria, Tunisia, and Lebanon* [University of

Central Florida]. https://pdfs.semanticscholar.org/ad33/7618f2f05bdb63ab82bbf8537841a282da6e.pdf

Chehade, N. (2016, January 20). 20 Years of Financial Inclusion in the Arab World. *Consultative Group to Assist the Poor*. https://www.cgap.org/blog/20-years-financial-inclusion-arab-world

Clarke, M., & Tittensor, D. (2016). *Islam and development: Exploring the invisible aid economy* (1st ed.). Routledge. https://books.google.co.ma/books?hl=en&lr=&id=o0wfDAAAQBAJ&oi=fnd&pg=PP1&dq=Islam+and+Development:+Exploring+the+Invisible+Aid+Econom…1/1

Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2009). *Microfinance Tradeoffs: Regulation, Competition, and Financing (Policy Research Working Paper 5086)*. http://econ.worldbank.org.

Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2011a). Microfinance Trade-Offs: Regulation, Competition and Financing. In B. Armendáriz & M. Labie (Eds.), *The handbook of microfinance* (p. 155). World Scientific Publishing Co. https://doi.org/10.1142/7645

Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2011b). Does Regulatory Supervision Curtail Microfinance Profitability and Outreach? *World Development*, *39*(6), 949–965. https://doi.org/10.1016/j.worlddev.2009.10.016

Demirguc-Kunt, A., Klapper, L., Singer, D., & Van Oudheusden, P. (2015). *The global findex database 2014: Measuring financial inclusion around the world*. http://documents.worldbank.org/curated/en/187761468179367706/pdf/WPS7255.pdf#page=3

Dieleman, J. L., & Templin, T. (2014). Random-effects, fixed-effects and the within-between specification for clustered data in observational health studies: A simulation study. *PLoS ONE*, *9*(10). https://doi.org/10.1371/journal.pone.0110257

Donna Barne, & Divyanshi Wadhwa. (2019, October 20). *Year in Review: 2019 in 14 Charts*. World Bank Group. https://www.worldbank.org/en/news/feature/2019/12/20/year-in-review-2019-in-charts

Dorfleitner, G., Priberny, C., & Röhe, M. (2017). Why do microfinance institutions fail socially? A global empirical examination. *Finance Research Letters*, *22*, 81–89. https://doi.org/10.1016/j.frl.2016.12.027

Epstein, M. J., & Yuthas, K. (2010). Mission impossible: Diffusion and drift in the microfinance industry. In *Sustainability Accounting, Management and Policy Journal* (Vol. 1, Issue 2, pp. 201–221). https://doi.org/10.1108/20408021011089248

Ferreira, F. H. G. (2011). Poverty is multidimensional. But what are we going to do about it? In *Journal of Economic Inequality* (Vol. 9, Issue 3, pp. 493–495). https://doi.org/10.1007/s10888-011-9202-3

Flores, I., & Serres, P. (2009). Microfinance and non-financial services: An impossible marriage. *Private Sector and Developpment Proparcos Magazine*, *3*, 3. https://fi-compass.eu/sites/default/files/publications/microfinance-and-non-financial-services-an-impossible-marriage.pdf

Food and Agriculture Organization of the United Nations (FAO). (2019). *Women's access to rural finance: challenges and opportunities*. www.fao.org/

Frank, C., Lynch, E., & Schneider-Moretto, L. (2008). Stemming the tide of mission drift: microfinance transformations and the double bottom line. *Women's World Banking Focus Note*, *1*(4), 1–24.

Greeley, M. (2003). Poverty reduction and microfinance - Assessing performance. *IDS Bulletin*, *34*(4), 10–20. https://doi.org/10.1111/j.1759-5436.2003.tb00086.x

Gujarati, D. N., Porter, C. D., & Gunasekar, S. (2007). *Basic Econometrics: Special Indian Edition* (4th ed.). Tata McGraw - Hill Education.

Gutiérrez-Goiria, J., & Goitisolo, B. (2011). Profitability and social performance of Microfinance Institutions: empirical evidence of relations between different types of variables. *Revista de Economía Mundial*, *27*, 189–214. http://ssrn.com/abstract=1815233http://ssrn.com/abstract=1815233

Hermes, N., Lensink, R., & Meesters, A. (2011). Outreach and Efficiency of Microfinance Institutions. *World Development*, *39*(6), 938–948. https://doi.org/10.1016/j.worlddev.2009.10.018

Hossain, S., Galbreath, J., Hasan, M. M., & Randøy, T. (2020). Does competition enhance the double-bottom-line performance of microfinance institutions? *Journal of Banking and Finance*, *113*. https://doi.org/10.1016/j.jbankfin.2020.105765

Hsiao, C. (2007). Panel Data Analysis-Advantages and Challenges. *Test*, *16*(1), 1–22. https://link.springer.com/content/pdf/10.1007/s11749-007-0046-x.pdf

Hulme, D. (2008). The Story of the Grameen Bank : From Subsidised Microcredit to Market-based Microfinance. *Brooks World Poverty Institute , Working Paper No. 60*, 2–9. file:///Users/patrick/Documents/Education/GLODEP International Development Studies/4th Semester Research Stay:Internship/SSRN-id1300930.pdf

Ina Kota. (2007). Back to Basics - Microfinance: Banking for the Poor . *International Monetary Fund: Finance & Development*, *44*(2).

https://www.imf.org/external/pubs/ft/fandd/2007/06/basics.htm

Kabbani, N. (2019). *Youth Employment in the Middle East and North Africa: Revisiting and Reframing the Challenge*. https://www.brookings.edu/research/youth-employment-in-the-middle-east-and-north-africa-revisiting-and-reframing-the-challenge/

Kar, A. K. (2010). *Sustainability and Mission Drift in Microfinance : Empirical studies on mutual exclusion of double bottom lines* (Issue 217). http://www.hanken.fi

Kar, A. K. (2013). Double bottom lines in microfinance: are they mutually exclusive? *Journal of Small Business and Entrepreneurship*, *26*(1), 87–107. https://doi.org/10.1080/08276331.2012.761804

Kereta, B. B. (2007). Outreach and financial performance analysis of microfinance institutions in Ethiopia. *African Economic Conference 2007: Opportunities and Challenges of Development for Africa in the Global Arena*. https://repository.uneca.org/bitstream/handle/10855/1309/Bib-12958.pdf?sequence=1&isAllowed=y

Kumar Kar, A. (2011). Microfinance Institutions: A Cross-Country Empirical Investigation of Outreach and Sustainability. *Journal of Small Business & Entrepreneurship*, *24*(3), 427–446. https://doi.org/10.1080/08276331.2011.10593547

Lopatta, K., Tchikov, M., Jaeschke, R., & Lodhia, S. (2017). Sustainable Development and Microfinance: The Effect of Outreach and Profitability on Microfinance Institutions' Development Mission. *Sustainable Development*, *25*(5), 386–399. https://doi.org/10.1002/sd.1663

Marakkath, N. (2014). Sustainability of Indian microfinance institutions: A mixed methods approach. In *Sustainability of Indian Microfinance Institutions: A Mixed Methods Approach*. Springer India. https://doi.org/10.1007/978-81-322-1629-2

McConaghy, P. (2020). MENA Micro-Financing. *Arab.Org*. https://arab.org/blog/mena-micro-financing/

Mecha, N. S. (2017). Effect of Microfinance on Poverty Reduction: A Critical Scrutiny of Theoretical Literature. *Global Journal of Commerce & Management Perspective*, *6*(3), 16–33. https://doi.org/10.24105/gjcmp.6.3.1702

Mersland, R., & Øystein Strøm, R. (2013). Microfinance: Costs, Lending Rates, and Profitability. In *Handbook of Key Global Financial Markets, Institutions and Infrastructure* (pp. 489–499). Elsevier Inc. https://doi.org/10.1016/B978-0-12-397873-8.00046-3

Mersland, Roy, & Strøm, R. Ø. (2010a). Microfinance Mission Drift? *World Development*,

38(1), 28–36. https://doi.org/10.1016/j.worlddev.2009.05.006

Mersland, Roy, & Strøm, R. Ø. (2010b). Microfinance Mission Drift? *World Development*, *38*(1), 28–36. https://doi.org/10.1016/j.worlddev.2009.05.006

Mia, M. A., & Lee, H. A. (2017). Mission drift and ethical crisis in microfinance institutions: What matters? *Journal of Cleaner Production*, *164*, 102–114. https://doi.org/10.1016/j.jclepro.2017.06.176

Microfinance Information Exchange (MIX), Sanabel, & Consultative Group to Assist the Poor (CGAP). (2010). *2009 Arab Microfinance Analysis Benchmarking Report*. https://www.arabdevelopmentportal.com/sites/default/files/publication/656.2009_arab_microfinance_analysis_benchmarking_report.pdf

MicroWorld. (2013, November 18). The challenges of Financial Inclusion in MENA Region. *MicroWorld.Org*. https://www.microworld.org/en/news-from-the-field/article/challenges-financial-inclusion-mena-region

Morduch, J. (2000). The Microfinance Schism. *World Development*, *28*(4), 617–629. www.elsevier.com/locate/worlddev

Morgan, P. (2015). *Legal Form, Performance and Risk in the Microfinance Industry*. Utrecht University.

Muriu, B. P. (2011). Microfinance Profitability: Does financing choice matter? In *Birmingham Business School* .

Nawaz, A. (2010a). Issues in Subsidies and Sustainability of Microfinance : An Empirical Investigation . *Universite Libre de Bruxelles CEB Working Paper*, *32*(N° 10/010), 0–33. file:///C:/Users/user/Downloads/RePEc_sol_wpaper_10-010.pdf

Nawaz, A. (2010b). *Issues in Subsidies and Sustainability of Microfinance: An Empirical Investigation*. https://www.researchgate.net/publication/46465760

Omri, W., & Chkoundali, R. (2011). The Convergence Between Outreach and Financial Performance in Mediterranean MFIs: A Panel Data Analysis. *Transition Studies Review*, *18*(1), 149–163. https://doi.org/10.1007/s11300-011-0185-3

Parker, T. (2019). *What's a Good Profit Margin for a New Business?* Investopedia. https://www.investopedia.com/articles/personal-finance/093015/whats-good-profit-margin-new-business.asp

Perron, J. L. (2016). *Microfinance Barometer 2016 Sustainable Development Goals: What are the Stakes for Microfinance*. http://www.convergences.org/wp-content/uploads/2016/09/BMF-EN-FINAL-2016-Version-web.pdf

Quayes, S. (2012). Depth of outreach and financial sustainability of microfinance institutions.

Applied Economics, *44*(26), 3421–3433. https://doi.org/10.1080/00036846.2011.577016

Rocha, R. (2011). Financial access and stability: A road map for the Middle East and North Africa. In *MENA Knowledge and Learning: Quick Notes Series* (Issue 46). https://openknowledge.worldbank.org/bitstream/handle/10986/10868/661070BRI0QN460Box365730B00PUBLIC0.pdf?sequence=1&isAllowed=y

Roser, M., & Ortiz-Ospina, E. (2013). *Global Extreme Poverty*. Our World in Data. https://ourworldindata.org/extreme-poverty

Rossel-Cambier, K. (2010a). *Do Multiple Financial Services Enhance the Poverty Outreach of Microfinance Institutions?* https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Do+Multiple+Financial+Services+Enhance+the+Poverty+Outreach+of+Microfinance+Institutions%3F+Rossel-Cambier+K&btnG=#d=gs_cit&u=%2Fscholar%3Fq%3Dinfo%3AcuudwpSE9XoJ%3Ascholar.google.com%2F%26output%3Dc

Rossel-Cambier, K. (2010b). Do Multiple Financial Services Enhance the Poverty Outreach of Microfinance Institutions? *ULB -- Universite Libre de Bruxelles, Working Papers CEB: 10-058, 2010, 40 p. Pp.*, *32*(0), 40.

Roy, P., & Pati, A. P. (2019). Double bottom line commitments of microfinance: evidence from Indian institutions. *International Journal of Social Economics*, *46*(1), 116–131. https://doi.org/10.1108/IJSE-08-2016-0240

Saab, G. (2015). Micro Financing and Their "Mission Drift" Orientation The MENA Region Case. *Procedia Economics and Finance*, *30*, 790–796. https://doi.org/10.1016/s2212-5671(15)01328-3

Scola, B. (2012, June 6). Exclusion Costs: Financial Inclusion in the Arab World. *Consultative Group to Assist the Poor (CGAP)*. https://www.cgap.org/blog/exclusion-costs-financial-inclusion-arab-world

Sevestre, P. (2002). *Econométrie des données de panel*. Dunod Editions.

Sheremenko, G., Escalante, C. L., & Florkowski, W. J. (2017). Financial Sustainability and Poverty Outreach: The Case of Microfinance Institutions in Eastern Europe and Central Asia. *European Journal of Development Research*, *29*(1), 230–245. https://doi.org/10.1057/ejdr.2016.12

Singh, V., & Padhi, P. (2019). Factors Influencing Outreach Performance of Microfinance Sector in India. *Asia-Pacific Journal of Management Research and Innovation*, *15*(4), 162–176. https://doi.org/10.1177/2319510x19883705

Soltane Bassem, B. (2014). Total factor productivity change of MENA microfinance

institutions: A Malmquist productivity index approach. *Economic Modelling*, *39*, 182–189. https://doi.org/10.1016/j.econmod.2014.02.035

Stock, J. H., & Watson, M. W. (2007). *Introduction to Econometrics*. Pearson Education.

Tchakoute-Tchuigoua, H. (2010). Is there a difference in performance by the legal status of microfinance institutions? *Quarterly Review of Economics and Finance*, *50*(4), 436–442. https://doi.org/10.1016/j.qref.2010.07.003

Torres-Reyna, O. (2007). *Panel Data Analysis Fixed and Random Effects using Stata (v. 4.2)*. Princeton University. http://dss.princeton.edu/training/

Tulchin, D. (2003). Microfinance's double bottom line. *MicroCapital Institute, Boston*, 7. www.socialenterprise.NET.

Vanroose, A., & D'Espallier, B. (2013a). Do microfinance institutions accomplish their mission? Evidence from the relationship between traditional financial sector development and microfinance institutions' outreach and performance. *Applied Economics*, *45*(15), 1965–1982. https://doi.org/10.1080/00036846.2011.641932

Vanroose, A., & D'Espallier, B. (2013b). Do microfinance institutions accomplish their mission? Evidence from the relationship between traditional financial sector development and microfinance institutions' outreach and performance. *Applied Economics*, *45*(15), 1965–1982. https://doi.org/10.1080/00036846.2011.641932

Von Stauffenberg, D., Jansson, T., Kenyon, N., & Barluenga-Badiola, M. C. (2003). Performance indicators for microfinance institutions. In *Technical guide (No. 46838)*. Inter-American Development Bank. www.microrate.com

Wagenaar, K. (2012). Institutional Transformation and Mission Drift in Microfinance. *Centre of Development Studies, University of Cambridge*, 1–35.

Wijesiri, M., Viganò, L., & Meoli, M. (2015). Efficiency of microfinance institutions in Sri Lanka: A two-stage double bootstrap DEA approach. *Economic Modelling*, *47*, 74–83. https://doi.org/10.1016/j.econmod.2015.02.016

Wijesiri, M., Yaron, J., & Meoli, M. (2017). Assessing the financial and outreach efficiency of microfinance institutions: Do age and size matter? *Journal of Multinational Financial Management*, *40*, 63–76. https://doi.org/10.1016/j.mulfin.2017.05.004

Woller, G. M., Woodworth, W., & Dunford, C. (1999). Where To Microfinance? In *International Journal of Economic Development* (Vol. 1, Issue 1). http://www.microfinance.com/English/Papers/Where_to_Microfinance.pdf

World Bank. (2019). *Decline of global extreme poverty continues but has slowed*. Press Release No. 2019/030/Dec-GPV. https://www.worldbank.org/en/news/press-

release/2018/09/19/decline-of-global-extreme-poverty-continues-but-has-slowed-world-bank

World Bank. (2020). *Understanding Poverty - Poverty Overview*. World Bank Group Website. https://www.worldbank.org/en/topic/poverty/overview

Zerai, B., & Rani, L. (2011). Is There a Tradeoff between Outreach and Sustainability of Micro finance institutions? Evidence from Indian Microfinance Institutions (MFIs). In *Research Journal of Finance and Accounting www.iiste.org ISSN* (Vol. 2, Issue 11). Online. www.iiste.org

FIGURES

Figure 11: Fixed Effects Model 1 (Average Loan per Borrower) - Heterogeneity Across MFIs (or entities)

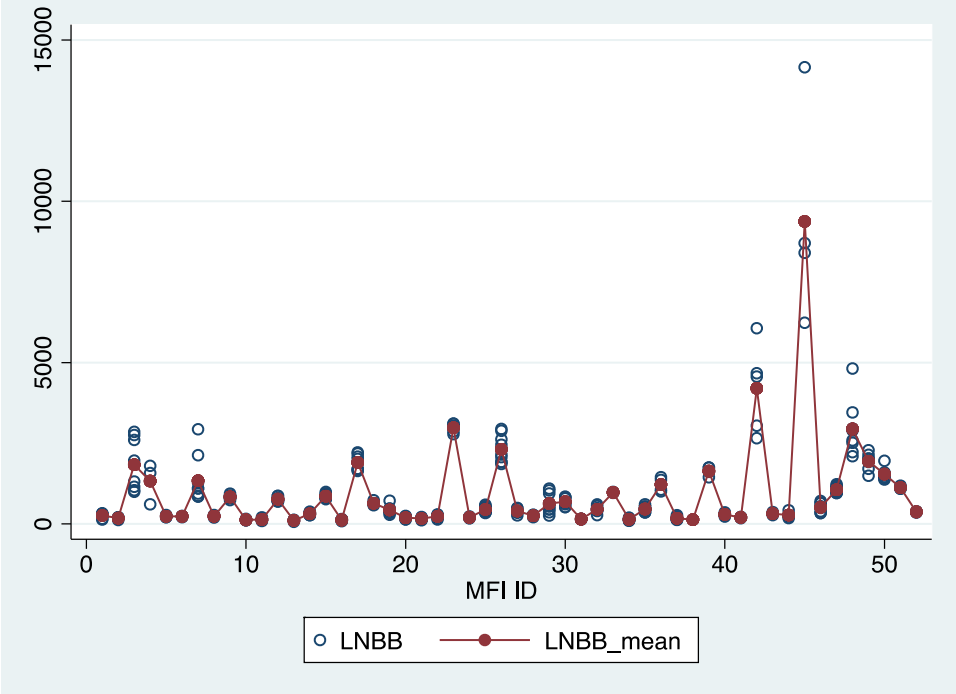


Figure 12: Fixed Effects Model 1 (Average Loan per Borrower) - Heterogeneity Across Years

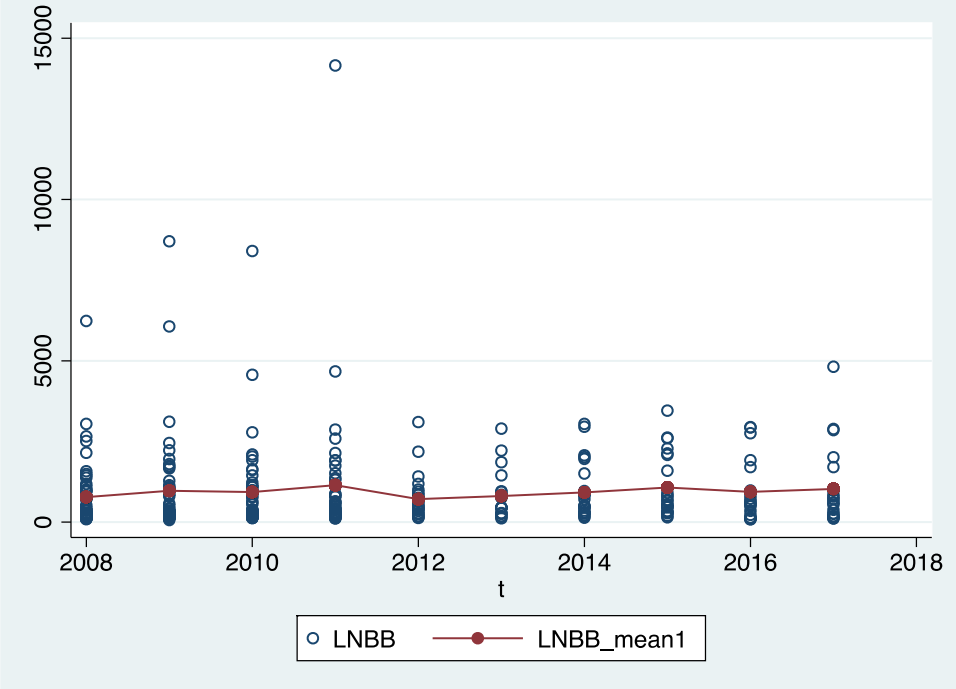


Figure 13: Fixed Effects Model 2 (Percentage of Female Borrowers) - Heterogeneity across MFIs (or entities)

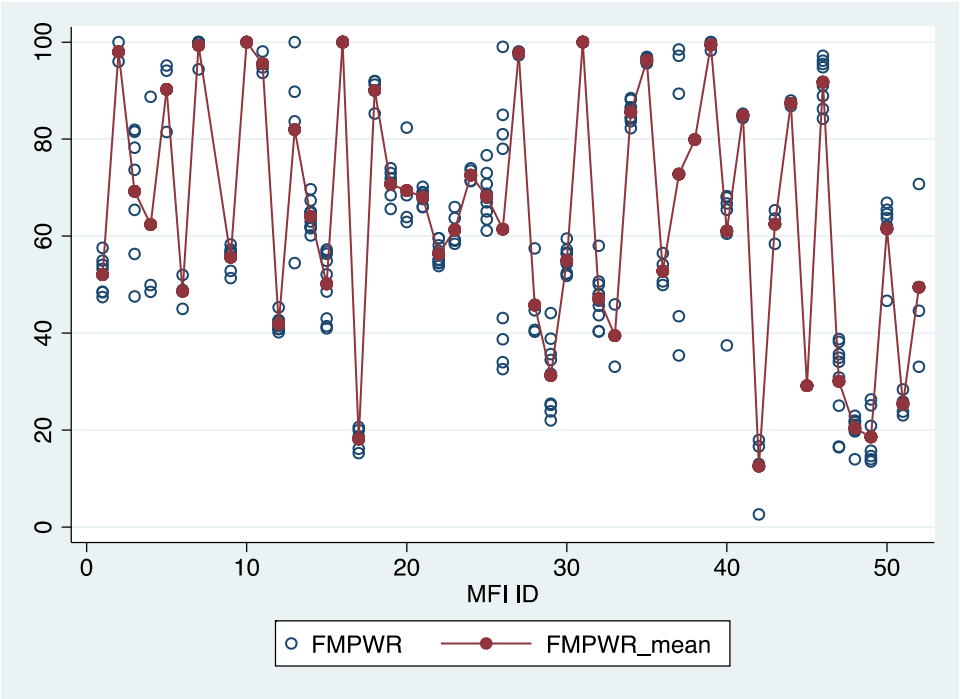
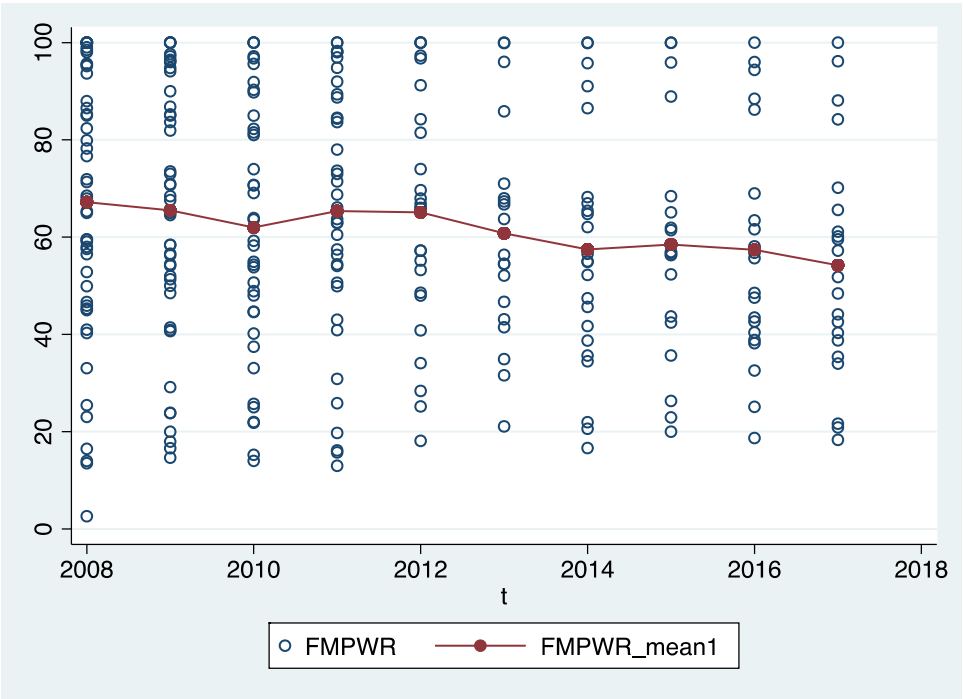


Figure 14: Fixed Effects Model 2 (Percentage of Female Borrowers) - Heterogeneity Across Years



APPENDICES

Appendix 1: Pooled OLS Regression Model 1 (Average Loan per Borower)

LNBB	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
OPSS_l	0.279	0.100	2.78	0.008	0.078	0.481	***
PATR_l	-1.081	7.823	-0.14	0.891	-16.787	14.625	
CTBR_l	4.470	1.393	3.21	0.002	1.673	7.267	***
PRFTMA_1	-1.251	2.175	-0.57	0.568	-5.617	3.116	
OPEXAS_1	-44.627	12.870	-3.47	0.001	-70.465	-18.789	***
Constant	950.641	268.913	3.54	0.001	410.775	1490.506	***

Mean dependent var	875.806	SD dependent var	1075.979
R-squared	0.611	Number of obs	237.000
F-test	9.781	Prob > F	0.000
Akaike crit. (AIC)	3768.926	Bayesian crit. (BIC)	3789.735

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

Appendix 2: Fixed Effects Estimation Model 1 (Average Loan per Borower)

LNBB	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
OPSS_l	0.162	0.069	2.34	0.020	0.026	0.299	**
PATR_l	-18.692	3.584	-5.21	0.000	-25.764	-11.620	***
CTBR_l	1.170	0.341	3.43	0.001	0.498	1.843	***
PRFTMA_1	-2.410	0.619	-3.89	0.000	-3.632	-1.189	***
OPEXAS_1	-7.470	3.559	-2.10	0.037	-14.493	-0.447	**
Constant	932.985	77.426	12.05	0.000	780.206	1085.764	***

Mean dependent var	875.806	SD dependent var	1075.979
R-squared	0.213	Number of obs	237.000
F-test	9.753	Prob > F	0.000
Akaike crit. (AIC)	3187.054	Bayesian crit. (BIC)	3207.863

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

Appendix 3: Random Effects Estimation Model 1 (Average Loan per Borower)

LNBB	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
OPSS_l	0.195	0.072	2.70	0.007	0.053	0.336	***
PATR_l	-17.742	3.641	-4.87	0.000	-24.879	-10.606	***
CTBR_l	2.017	0.284	7.11	0.000	1.461	2.573	***
PRFTMA_1	-2.531	0.641	-3.95	0.000	-3.787	-1.276	***
OPEXAS_1	-11.424	3.627	-3.15	0.002	-18.532	-4.316	***
Constant	895.630	150.801	5.94	0.000	600.066	1191.193	***

Mean dependent var	875.806	SD dependent var	1075.979
Overall r-squared	0.518	Number of obs	237.000
Chi-square	93.187	Prob > chi2	0.000
R-squared within	0.198	R-squared between	0.541

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

Appendix 4: Hausman Test - Model 1 (Average Loan per Borrower)

Hausman (1978) specification test

	Coef.
Chi-square test value	9.408
P-value	.094

Appendix 5: Testing for Random Effects with Breusch-Pagan Lagrange Multiplier (LM)

```
Breusch and Pagan Lagrangian multiplier test for random effects

        LNBB[i,t] = Xb + u[i] + e[i,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+------------------------------
                    LNBB |   1157732       1075.979
                       e |   50720.19       225.2114
                       u |   757269.2       870.2121

        Test:   Var(u) = 0
                                 chibar2(01) =    75.26
                              Prob > chibar2 =   0.0000
```

Appendix 6: Random Effects Estimation Model 1 (Average Loan per Borrower) - Robust

LNBB	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
OPSS_l	0.195	0.014	13.90	0.000	0.167	0.222	***
PATR_l	-17.742	6.514	-2.72	0.006	-30.510	-4.975	***
CTBR_l	2.017	0.497	4.06	0.000	1.044	2.990	***
PRFTMA_1	-2.531	0.519	-4.88	0.000	-3.548	-1.514	***
OPEXAS_1	-11.424	4.035	-2.83	0.005	-19.333	-3.516	***
Constant	895.630	157.944	5.67	0.000	586.065	1205.195	***

Mean dependent var	875.806	SD dependent var	1075.979
Overall r-squared	0.518	Number of obs	237.000
Chi-square	408.583	Prob > chi2	0.000
R-squared within	0.198	R-squared between	0.541

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

Appendix 7: Pooled OLS Regression Model 2 (Percentage of Female Borrowers)

FMPWR	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DTEQ_1	0.049	0.007	7.00	0.000	0.035	0.063	***
OPEXAS_1	0.807	0.351	2.30	0.026	0.101	1.513	**
PATR_1	0.611	0.364	1.68	0.099	-0.119	1.342	*
BRWRST_1	0.195	0.053	3.70	0.001	0.089	0.301	***
GRLN_1	0.000	0.000	-2.02	0.049	0.000	0.000	**
OPSS_l	0.003	0.004	0.85	0.400	-0.005	0.012	
RTAS_1	0.017	0.403	0.04	0.967	-0.792	0.826	
Constant	22.037	10.450	2.11	0.040	1.037	43.036	**

Mean dependent var	63.985	SD dependent var	25.149
R-squared	0.271	Number of obs	218.000
F-test	14.841	Prob > F	0.000
Akaike crit. (AIC)	1970.672	Bayesian crit. (BIC)	1997.748

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

Appendix 8: Fixed Effects Estimation Model 2 (Percentage of Female Borrowers)

FMPWR	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DTEQ_1	0.163	0.177	0.92	0.358	-0.186	0.512	
OPEXAS_1	0.077	0.112	0.69	0.493	-0.145	0.299	
PATR_1	0.259	0.115	2.25	0.026	0.031	0.486	**
BRWRST_1	0.036	0.017	2.10	0.037	0.002	0.069	**
GRLN_1	0.000	0.000	0.74	0.460	0.000	0.000	
OPSS_l	0.001	0.002	0.42	0.674	-0.003	0.005	
RTAS_1	0.039	0.118	0.34	0.738	-0.193	0.272	
Constant	54.862	3.112	17.63	0.000	48.716	61.008	***

Mean dependent var	63.985	SD dependent var	25.149
R-squared	0.070	Number of obs	218.000
F-test	1.742	Prob > F	0.004
Akaike crit. (AIC)	1389.426	Bayesian crit. (BIC)	1416.502

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

Appendix 9: Random Effects Estimation Model 2 (Percentage of Female Borrowers)

FMPWR	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DTEQ_1	0.050	0.037	1.33	0.183	-0.023	0.123	
OPEXAS_1	0.106	0.112	0.95	0.344	-0.113	0.324	
PATR_1	0.295	0.112	2.64	0.008	0.076	0.514	***
BRWRST_1	0.048	0.017	2.90	0.004	0.016	0.081	***
GRLN_1	0.000	0.000	0.44	0.659	0.000	0.000	
OPSS_l	0.001	0.002	0.47	0.640	-0.003	0.005	
RTAS_1	0.049	0.118	0.42	0.677	-0.182	0.280	
Constant	53.254	4.334	12.29	0.000	44.760	61.749	***

Mean dependent var	63.985	SD dependent var	25.149
Overall r-squared	0.151	Number of obs	218.000
Chi-square	17.973	Prob > chi2	0.012
R-squared within	0.066	R-squared between	0.159

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

Appendix 10: Hausman Test – Model 2 (Percentage of Female Borrowers)

Hausman (1978) specification test

	Coef.
Chi-square test value	16.073
P-value	.013

Appendix 11: Test for Time-Fixed Effects – Model 2 (Percentage of Female Borrowers)

FMPWR	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DTEQ_1	0.169	0.179	0.94	0.346	-0.185	0.524	
OPEXAS_1	0.013	0.117	0.11	0.914	-0.219	0.244	
PATR_1	0.250	0.119	2.10	0.037	0.015	0.484	**
BRWRST_1	0.038	0.017	2.18	0.031	0.004	0.073	**
GRLN_1	0.000	0.000	0.99	0.326	0.000	0.000	
OPSS_l	0.001	0.002	0.57	0.570	-0.003	0.005	
RTAS_1	-0.007	0.121	-0.06	0.956	-0.245	0.232	
2008b.t	0.000	.	.	.	.	.	
2009.t	0.748	2.382	0.31	0.754	-3.958	5.455	
2010.t	0.654	2.418	0.27	0.787	-4.124	5.432	
2011.t	2.251	2.477	0.91	0.365	-2.643	7.145	
2012.t	3.314	2.638	1.26	0.211	-1.898	8.527	
2013.t	3.030	2.916	1.04	0.300	-2.731	8.791	
2014.t	2.458	2.708	0.91	0.366	-2.893	7.809	
2015.t	1.535	2.712	0.57	0.572	-3.824	6.893	
2016.t	-0.609	2.792	-0.22	0.828	-6.126	4.908	
2017.t	-1.760	2.718	-0.65	0.518	-7.130	3.611	
Constant	54.299	3.811	14.25	0.000	46.769	61.829	***

Mean dependent var	63.985	SD dependent var	25.149
R-squared	0.115	Number of obs	218.000
F-test	1.239	Prob > F	0.144
Akaike crit. (AIC)	1396.622	Bayesian crit. (BIC)	1454.159

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

Appendix 12: Wald test for Time-Fixed Effects Model 2 (Percentage of Female Borrowers)

(1) 2009.t = 0
(2) 2010.t = 0
(3) 2011.t = 0
(4) 2012.t = 0
(5) 2013.t = 0
(6) 2014.t = 0
(7) 2015.t = 0
(8) 2016.t = 0
(9) 2017.t = 0
F(9, 152) = 0.86
Prob > F = 0.5642

Appendix 13: Modified Wald Test for Groupwise Heteroskedasticity in Fixed Effect Regression Model

```
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (50)  =    3.1e+31
Prob>chi2 =      0.0000
```

Appendix 14: Fixed Effects Estimation – Model 2 (Percentage of Female Borrowers) with Robust/Clustered Standard Errors

FMPWR	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DTEQ_1	0.163	0.256	0.64	0.527	-0.351	0.677	
OPEXAS_1	0.077	0.097	0.80	0.430	-0.118	0.272	
PATR_1	0.259	0.174	1.48	0.144	-0.092	0.609	
BRWRST_1	0.036	0.017	2.16	0.036	0.003	0.069	**
GRLN_1	0.000	0.000	0.50	0.619	0.000	0.000	
OPSS_l	0.001	0.000	2.16	0.036	0.000	0.002	**
RTAS_1	0.039	0.104	0.38	0.707	-0.170	0.249	
Constant	54.862	3.567	15.38	0.000	47.693	62.031	***

Mean dependent var	63.985	SD dependent var	25.149
R-squared	0.070	Number of obs	218.000
F-test	29.260	Prob > F	0.000
Akaike crit. (AIC)	1387.426	Bayesian crit. (BIC)	1411.118

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

Appendix 15: Fixed Effects Estimation – Model 2 (Percentage of Female Borrowers), Logs of the Lagged Explanatory Variables

FMPWR	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
logDTEQ_1	-1.515	1.370	-1.11	0.275	-4.281	1.252	
logOPEXAS_1	0.301	1.170	0.26	0.798	-2.061	2.664	
logPATR_1	-0.464	0.595	-0.78	0.439	-1.665	0.737	
logBRWRST_1	2.306	3.207	0.72	0.476	-4.170	8.782	
logGRLN_1	2.340	2.042	1.15	0.259	-1.785	6.464	
logOPSS_l	1.325	1.078	1.23	0.226	-0.852	3.501	
logRTAS_1	0.279	0.942	0.30	0.768	-1.623	2.182	
Constant	5.933	31.879	0.19	0.853	-58.449	70.315	

Mean dependent var	64.275	SD dependent var	24.215
R-squared	0.131	Number of obs	158.000
F-test	2.029	Prob > F	0.084
Akaike crit. (AIC)	976.700	Bayesian crit. (BIC)	998.138

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